

# International Patent Classification

2011.01

Section B

PERFORMING OPERATIONS;  
TRANSPORTING



World Intellectual Property Organization

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## SECTION B — PERFORMING OPERATIONS; TRANSPORTING

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## SEPARATING; MIXING

### Note(s)

The following notes are meant to assist in the use of this part of the classification scheme; they must not be read as modifying in any way the elaborations.

1. In this sub-section, the separation of different materials, e.g. of different matter, size, or state, is predominantly found in the following subclasses:  
B01D  
B03B, B03C, B03D  
B04B, B04C  
B07B, B07C.

2. The classifying characteristics of these subclasses are:
  - i. the physical state of the matter to be separated;
  - ii. the principle of the process used;
  - iii. particular kinds of apparatus.

The first of these characteristics involves six different aspects, assembled in three groups:

- a. liquid/liquid or liquid/gas and gas/gas;
- b. solid/liquid or solid/gas;
- c. solid/solid.
3. These subclasses are to be used according to the following general rules:
  - B01D is the most general class as far as separation other than solids from solids is concerned.
  - Apparatus for separating solids from solids are covered by B03B when the process concerned is regarded as the equivalent of "washing" in the sense of the mining art, even if such apparatus is a pneumatic one, especially pneumatic tables or jigs. Screens per se are not covered by this subclass but are classified in B07B, even if they are being used in a wet process. All other apparatus for the separation of solids from solids according to dry methods are classified in B07B.
  - If the separation takes place as a result of the detection or measurement of some feature of the material or articles to be sorted it is classified in B07C.
  - It should also be noted that the separation of isotopes of the same chemical element is covered by B01D 59/00, whatever process or apparatus is employed.

### Class index

#### LIQUID/LIQUID, LIQUID/GAS OR GAS/GAS SEPARATION

##### Method

General operations.....	B01D
by centrifugal force, using centrifuges or free-vortex apparatus.....	B01D
using magnetic or electrostatic effect.....	B03C

##### Apparatus

General operations.....	B01D
by centrifugal force, using centrifuges or free-vortex apparatus.....	B04B, B04C
using magnetic or electrostatic effect.....	B03C

#### SOLID/LIQUID OR SOLID/GAS SEPARATION

##### Method

General operations.....	B01D
by centrifugal force.....	B01D
using centrifuges or free-vortex apparatus.....	B01D
using magnetic or electrostatic effect.....	B03C

##### Apparatus

General operations.....	B01D
by centrifugal force.....	B01D
using centrifuges or free-vortex apparatus.....	B04B, B04C
using magnetic or electrostatic effect.....	B03C

#### SOLID/SOLID SEPARATION

##### Method

##### Dry methods

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Individual sorting.....	B07C
Screening, sifting, pneumatic sorting.....	B07B
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by magnetic or electrostatic effect.....	B03C
by centrifugal force.....	B07B
using centrifuges or free-vortex apparatus.....	B07B



Wet methods	
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screening.....	B07B
Combinations Dry methods - wet methods.....	B03B
Apparatus	
Dry methods	
material in bulk.....	B07B
Individual sorting.....	B07C
Screening, sifting, pneumatic sorting.....	B07B
using pneumatic tables or jigs.....	B03B
by magnetic or electrostatic effect.....	B03C
by centrifugal force.....	B07B
using centrifuges or free-vortex apparatus.....	B04B, B04C
Wet methods	
General operations.....	B03B
flotation, differential sedimentation.....	B03D
screening.....	B07B
Combinations Dry methods - wet methods.....	B03B

## B01 PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

### B01B BOILING; BOILING APPARATUS

1/00	<b>Boiling; Boiling apparatus for physical or chemical purposes</b> (preparation of starch C08B 30/00; sugar industry C13; steam generation F22; domestic boilers F24) [2]	1/02	• Preventing foaming (in general B01D 19/02)
		1/04	• • by chemical means
		1/06	• Preventing bumping
		1/08	• Boiling apparatus provided with reflux condenser

**B01D SEPARATION** (separating solids from solids by wet methods B03B, B03D, by pneumatic jigs or tables B03B, by other dry methods B07; magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high-voltage electric fields B03C; centrifuges B04B; vortex apparatus B04C; presses per se for squeezing-out liquid from liquid-containing material B30B 9/02) [5]

#### Note(s)

- This subclass covers :
  - evaporation, distillation, crystallisation, filtration, dust precipitation, gas cleaning, absorption, adsorption;
  - similar processes which are not concerned with, or limited to, separation (except in the case of absorption or adsorption).
- In this subclass, the terms or expressions are used with the meaning indicated:
  - "filtration" and analogous terms include straining solids from fluids. Filtration is a process that normally uses a filter medium;
  - "filter medium" is a porous material or porous arrangement of material used to filter solids from fluids;
  - "filtering element" is a section of filter medium in addition to parts to which the medium is demountably or permanently fixed, including other sections of medium, end caps, peripheral frames or edge strips, but excluding housings;
  - "filter housing" is the fluid-constraining impervious vessel, whether open or closed, which contains, or is adapted to contain, one or more filtering elements or filter media;
  - "filter chamber" is the space within a housing, where filtering elements or filter media are located. Partitions may divide a single housing into a plurality of chambers;
  - "filtering apparatus" consists of filtering elements combined with housings, cleaning arrangements, motor or the like parts, which are characteristic of the particular type of apparatus. Ancillary devices such as pumps or valves are considered part of a filtering apparatus when inside the apparatus. Ancillary devices performing similar or different unit operation such as comminutors, mixers or non-filtering separators, whether or not inside the apparatus, are not considered part of a filtering apparatus. The term does not extend to apparatus, e.g. washing machines, of which the filter forms only a part.
- For apparatus used in drying or evaporation, class F26 takes precedence over this subclass.
- Group B01D 59/00 takes precedence over the other groups of this subclass and over other subclasses in class B01.

Subclass index

EVAPORATION; DISTILLATION; SUBLIMATION.....	1/00, 3/00, 5/00, 7/00
COLD TRAPS, COLD BAFFLES.....	8/00
CRYSTALLISATION.....	9/00
SOLVENT EXTRACTION.....	11/00
TREATING LIQUIDS: DISPLACEMENT, ADSORPTION, SEPARATION, DEGASIFICATION, CHROMATOGRAPHY.....	12/00, 15/00, 17/00, 19/00
TREATING GASES OR VAPOURS: SEPARATION, RECOVERING, CHEMICAL OR BIOLOGICAL PURIFICATION OF WASTE GASES.....	53/00
SEPARATION OF SUSPENDED PARTICLES FROM LIQUIDS	
By sedimentation.....	21/00
By filtration	
processes.....	37/00
gravity filters; filters formed from filtering elements, pressure or suction filters.....	24/00, 25/00, 29/00
cartridge filters.....	27/00
filters with mobile filtering elements.....	33/00
filtering devices.....	35/00
filter circuits or combinations.....	36/00
By other processes.....	43/00
SEPARATION OF DISPERSED PARTICLES FROM GASES OR VAPOURS	
Pretreatment of the gas or vapour.....	51/00
By gravity, inertia, centrifugal force; by filtration; by a combination of devices.....	45/00, 46/00, 50/00
By other methods.....	47/00, 49/00
FILTERING MATERIALS.....	39/00, 41/00
SEPARATION OF ISOTOPES.....	59/00
ABSORPTION, ADSORPTION, CHROMATOGRAPHY; OTHER SEPARATING METHODS.....	15/00, 15/08, 53/02, 53/14, 57/00
SEPARATION USING SEMI-PERMEABLE MEMBRANES; DIALYSIS, OSMOSIS, ULTRAFILTRATION.....	61/00-71/00

<b>1/00</b>	<b>Evaporating</b> (drying solid materials or objects by evaporating liquids therefrom F26B)	3/18	• • • with horizontal bubble plates
1/02	• Evaporators with heating coils	3/20	• • • • Bubble caps; Risers for vapour; Discharge pipes for liquid
1/04	• Evaporators with horizontal tubes	3/22	• • • with horizontal sieve plates or grids; Construction of sieve plates or grids
1/06	• Evaporators with vertical tubes	3/24	• • • with sloping plates or elements mounted stepwise
1/08	• • with short tubes (B01D 1/12 takes precedence)	3/26	• • Fractionating columns in which vapour and liquid flow pass each other, or in which the fluid is sprayed into the vapour, or in which a two-phase mixture is passed in one direction
1/10	• • with long tubes, e.g. Kestner evaporators (B01D 1/12 takes precedence)	3/28	• • • Fractionating columns with surface contact and vertical guides, e.g. film action
1/12	• • and forced circulation	3/30	• • Fractionating columns with movable parts or in which centrifugal movement is caused
1/14	• with heated gases or vapours in contact with the liquid	3/32	• • Other features of fractionating columns
1/16	• by spraying (B01D 1/22 takes precedence)	3/34	• with one or more auxiliary substances
1/18	• • to obtain dry solids (B01D 1/24 takes precedence)	3/36	• • Azeotropic distillation
1/20	• • Sprayers	3/38	• • Steam distillation
1/22	• by bringing a thin layer of the liquid into contact with a heated surface	3/40	• • Extractive distillation
1/24	• • to obtain dry solids	3/42	• Regulation; Control
1/26	• Multiple-effect evaporating		
1/28	• with vapour compression		
1/30	• Accessories for evaporators		
<b>3/00</b>	<b>Distillation or related exchange processes in which liquids are contacted with gaseous media, e.g. stripping [2]</b>	<b>5/00</b>	<b>Condensation of vapours; Recovering volatile solvents by condensation</b> (B01D 8/00 takes precedence; condensers F28B) [3]
3/02	• in boilers or stills [2]	<b>7/00</b>	<b>Sublimation</b> (B01D 8/00 takes precedence; freeze-drying F26)
3/04	• pipe stills	7/02	• Crystallisation directly from the vapour phase (into single crystals C30B 23/00) [2]
3/06	• Flash distillation [2]		
3/08	• in rotating vessels; Atomisation on rotating discs (B01D 3/10 takes precedence)	<b>8/00</b>	<b>Cold traps; Cold baffles [3]</b>
3/10	• Vacuum distillation (B01D 3/12 takes precedence) [2]	<b>9/00</b>	<b>Crystallisation</b> (crystallisation directly from the vapour phase B01D 7/02; making single crystals C30B)
3/12	• Molecular distillation [2]	9/02	• from solutions
3/14	• Fractional distillation		
3/16	• • Fractionating columns in which vapour bubbles through liquid		

- 9/04 • • concentrating solutions by removing frozen solvent therefrom

#### 11/00 Solvent extraction

- 11/02 • of solids  
11/04 • of solutions which are liquid

#### 12/00 Displacing liquid, e.g. from wet solids or from dispersions of liquids or from solids in liquids, by means of another liquid

#### 15/00 Separating processes involving the treatment of liquids with solid sorbents; Apparatus therefor [4]

- 15/02 • with moving adsorbents  
15/04 • with ion-exchange materials as adsorbents (B01D 15/36 takes precedence) [1, 2006.01]  
15/08 • Selective adsorption, e.g. chromatography

##### Note(s) [2006.01]

In order that group B01D 15/08 may provide a basis for a complete search with respect to chromatography in general, all subject matter of general interest is classified in this group even if it is classified primarily in the application-oriented groups, for example dairy products A23C 9/148, treatment of blood e.g. A61M 1/36, optically active organic compounds C07B 57/00 or peptides C07K 1/16.

- 15/10 • • characterised by constructional or operational features [2006.01]  
15/12 • • • relating to the preparation of the feed [2006.01]  
15/14 • • • relating to the introduction of the feed to the apparatus [2006.01]  
15/16 • • • relating to the conditioning of the fluid carrier [2006.01]  
15/18 • • • relating to flow patterns [2006.01]  
15/20 • • • relating to the conditioning of the sorbent material [2006.01]  
15/22 • • • relating to the construction of the column [2006.01]  
15/24 • • • relating to the treatment of the fractions to be distributed [2006.01]  
15/26 • • characterised by the separation mechanism [2006.01]  
15/30 • • • Partition chromatography [2006.01]  
15/32 • • • Bonded phase chromatography, e.g. with normal bonded phase, reversed phase or hydrophobic interaction [2006.01]  
15/34 • • • Size-selective separation, e.g. size-exclusion chromatography; Gel filtration; Permeation [2006.01]  
15/36 • • • involving ionic interaction, e.g. ion-exchange, ion-pair, ion-suppression or ion-exclusion [2006.01]  
15/38 • • • involving specific interaction not covered by one or more of groups B01D 15/30-B01D 15/36, e.g. affinity, ligand exchange or chiral chromatography [2006.01]  
15/40 • • • using supercritical fluid as mobile phase or eluent [2006.01]  
15/42 • • characterised by the development mode, e.g. by displacement or by elution [2006.01]

#### 17/00 Separation of liquids, not provided for elsewhere, e.g. by thermal diffusion

- 17/02 • Separation of non-miscible liquids  
17/022 • • by contact with a preferentially wettable solid [4]  
17/025 • • by gravity, in a settling tank [4]  
17/028 • • • provided with a set of baffles [4]

- 17/032 • • • provided with special equipment for removing at least one of the separated liquids [4]  
17/035 • • by using gas-bubbles or moving solids introduced into the mixture [4]  
17/038 • • by centrifugal force (centrifuges B04B; cyclones B04C) [4]  
17/04 • • Breaking emulsions  
17/05 • • • by chemical treatment [4]  
17/06 • Separation of liquids from each other by electricity  
17/09 • by thermal diffusion [4]  
17/12 • Auxiliary equipment particularly adapted for use with liquid-separating apparatus, e.g. control circuits [4]

#### 19/00 Degasification of liquids

- 19/02 • Foam dispersion or prevention  
19/04 • • by addition of chemical substances

#### 21/00 Separation of suspended solid particles from liquids by sedimentation (differential sedimentation B03D 3/00)

- 21/01 • using flocculating agents [2]  
21/02 • Settling tanks [4]  
21/04 • • with moving scrapers  
21/06 • • • with rotating scrapers  
21/08 • • provided with flocculating compartments  
21/18 • Construction of the scrapers or the driving mechanisms for settling tanks  
21/20 • • Driving mechanisms  
21/22 • • Safety mechanisms  
21/24 • Feed or discharge mechanisms for settling tanks  
21/26 • Separation of sediment aided by centrifugal force  
21/28 • Mechanical auxiliary equipment for acceleration of sedimentation, e.g. by vibrators or the like [4]  
21/30 • Control equipment [4]  
21/32 • • Density control of clear liquid or sediment, e.g. optical control [4]  
21/34 • • Regulation of feed distribution; Regulation of liquid level [4]

#### Filtration; Filtering material, regeneration thereof [2]

#### 24/00 Filters comprising loose filtering material, i.e. filtering material without any binder between the individual particles or fibres thereof (B01D 27/02 takes precedence) [5]

- 24/02 • with the filter bed stationary during the filtration [5]  
24/04 • • the filtering material being clamped between pervious fixed walls (B01D 24/10, B01D 24/20 take precedence) [5]  
24/06 • • • the pervious walls comprising a series of louvres or slots [5]  
24/08 • • • the filtering material being supported by at least two pervious coaxial walls [5]  
24/10 • • the filtering material being held in a closed container [5]  
24/12 • • • Downward filtration, the filtering material being supported by pervious surfaces (B01D 24/18 takes precedence) [5]  
24/14 • • • Downward filtration, the container having distribution or collection headers or pervious conduits (B01D 24/18 takes precedence) [5]  
24/16 • • • Upward filtration (B01D 24/18 takes precedence) [5]  
24/18 • • • Combined upward and downward filtration [5]  
24/20 • • the filtering material being provided in an open container [5]

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- 24/22 • • • Downward filtration, the filter material being supported by pervious surfaces [5]
- 24/24 • • • Downward filtration, the container having distribution or collection headers or pervious conduits [5]
- 24/26 • • • Upward filtration [5]
- 24/28 • with the filter bed moving during the filtration (with the filter bed fluidised B01D 24/36) [5]
- 24/30 • • Translation [5]
- 24/32 • • Rotation [5]
- 24/34 • with the filtering material and its pervious support moving (tipping buckets, trays or like sections B01D 33/327) [5]
- 24/36 • with the filter bed fluidised during the filtration (with the filter bed being stationary B01D 24/02) [5]
- 24/38 • Feed or discharge devices [5]
- 24/40 • • for feeding [5]
- 24/42 • • for discharging filtrate [5]
- 24/44 • • for discharging filter cake, e.g. chutes [5]
- 24/46 • Regenerating the filtering material in the filter (B01D 24/44 takes precedence) [5]
- 24/48 • integrally combined with devices for controlling the filtration [5]

### 25/00 **Filters formed by clamping together several filtering elements or parts of such elements** (disc filters B01D 29/39) [5]

- 25/02 • in which the elements are pre-formed independent filtering units, e.g. modular systems
- 25/12 • Filter presses, i.e. of the plate or plate and frame type
- 25/127 • • with one or more movable filter bands arranged to be clamped between the press plates or between a plate and a frame during filtration, e.g. zigzag endless filter bands (B01D 25/172, B01D 25/176, B01D 25/19 take precedence) [5]
- 25/133 • • • with compression of the filter cake, e.g. by inflatable membranes [5]
- 25/164 • • Chamber-plate presses, i.e. the sides of the filtering elements being clamped between two successive filtering plates (B01D 25/127, B01D 25/172, B01D 25/176, B01D 25/19 take precedence) [5]
- 25/168 • • • with compression of the filter cake, e.g. by inflatable membranes [5]
- 25/172 • • Plate spreading means (removal of filter cakes B01D 25/32) [5]
- 25/176 • • attaching the filter element to the filter press plates, e.g. around the central feed hole in the plates [5]
- 25/19 • • Clamping means for closing the filter press, e.g. hydraulic jacks [5]
- 25/21 • • Plate and frame presses (B01D 25/172, B01D 25/176, B01D 25/19 take precedence) [5]
- 25/22 • Cell-type filters
- 25/24 • • Cell-type roll filters
- 25/26 • • Cell-type stack filters
- 25/28 • Leaching or washing filter cakes in the filter
- 25/30 • Feeding devices
- 25/32 • Removal of filter cakes
- 25/34 • • by moving the filter elements
- 25/36 • • • by centrifugal force
- 25/38 • • by moving parts, e.g. scrapers, contacting stationary filter elements

### 27/00 **Cartridge filters of the throw-away type** [5]

- 27/02 • with cartridges made from a mass of loose material

- 27/04 • with cartridges made of a piece of unitary material, e.g. filter paper
- 27/06 • • with corrugated, folded or wound material
- 27/07 • • • having a coaxial stream through the filtering element [5]
- 27/08 • Construction of the casing
- 27/10 • Safety devices, e.g. by-passes
- 27/14 • having more than one filtering element [5]

### 29/00 **Filters with filtering elements stationary during filtration, e.g. pressure or suction filters, not covered by groups B01D 24/00-B01D 27/00; Filtering elements therefor**

- 29/01 • with flat filtering elements (B01D 29/39 takes precedence) [5]
- 29/03 • • self-supporting [5]
- 29/05 • • supported [5]
- 29/07 • • • with corrugated, folded or wound filtering sheets [5]
- 29/075 • • located in a closed housing and comprising scrapers or agitators on the cake side of the filtering elements, e.g. Nutsche- or Rosenmund-type filters for performing multiple step operations such as chemical reactions, filtering and cake treatment [5]

#### Note(s)

If the subject matter classified in this group also contains relevant information covered by other subgroups of group B01D 29/00, it is also classified in the other appropriate subgroups of group B01D 29/00.

- 29/085 • Funnel filters; Holders therefor [5]

#### Note(s)

If the subject matter classified in this group also contains relevant information covered by other subgroups of group B01D 29/00, it is also classified in the other appropriate subgroups of group B01D 29/00.

- 29/09 • with filtering bands, e.g. movable between filtering operations [5]
- 29/11 • with bag, cage, hose, tube, sleeve or like filtering elements [5]
- 29/13 • • Supported filter elements [5]
- 29/15 • • • arranged for inward flow filtration [5]
- 29/17 • • • • open-ended [5]
- 29/19 • • • • on solid frames with surface grooves or the like [5]
- 29/21 • • • • with corrugated, folded or wound sheets [5]
- 29/23 • • • arranged for outward flow filtration [5]
- 29/25 • • • • open-ended [5]
- 29/27 • • • • Filter bags [5]
- 29/31 • • Self-supporting filtering elements [5]
- 29/33 • • • arranged for inward flow filtration [5]
- 29/35 • • • arranged for outward flow filtration [5]
- 29/37 • • • open-ended [5]
- 29/39 • with hollow discs side by side on, or around, one or more tubes, e.g. of the leaf type [5]
- 29/41 • • mounted transversely on the tube [5]
- 29/43 • • mounted otherwise than transversely on the tube [5]
- 29/44 • Edge filtering elements, i.e. using contiguous impervious surfaces [4]
- 29/46 • • of flat, stacked bodies [4]
- 29/48 • • of spirally or helically wound bodies [4]
- 29/50 • with multiple filtering elements, characterised by their mutual disposition (B01D 29/39 takes precedence) [5]

- 29/52 • • in parallel connection [5]
- 29/54 • • • arranged concentrically or coaxially [5]
- 29/56 • • in series connection [5]
- 29/58 • • • arranged concentrically or coaxially [5]
- 29/60 • integrally combined with devices for controlling the filtration [5]
- 29/62 • Regenerating the filter material in the filter (devices for taking out of action one or more units of multi-unit filters, e.g. for regeneration, B01D 35/12) [5]
- 29/64 • • by scrapers, brushes or the like, acting on the cake side of the filtering element [5]
- 29/66 • • by flushing, e.g. counter-current air-bumps [5]
- 29/68 • • • with backwash arms, shoes or nozzles [5]
- 29/70 • • by forces created by movement of the filter element [5]
- 29/72 • • • involving vibrations [5]
- 29/74 • • • involving centrifugal force [5]
- 29/76 • Handling the filter cake in the filter for purposes other than for regenerating (B01D 29/94 takes precedence) [5]
- 29/78 • • for washing [5]
- 29/80 • • for drying [5]
- 29/82 • • • by compression [5]
- 29/84 • • • by gases or by heating [5]
- 29/86 • • Retarding cake deposition on the filter during the filtration period, e.g. using stirrers [5]
- 29/88 • having feed or discharge devices [5]
- 29/90 • • for feeding [5]
- 29/92 • • for discharging filtrate [5]
- 29/94 • • for discharging the filter cake, e.g. chutes [5]
- 29/96 • in which the filtering elements are moved between filtering operations; Particular measures for removing or replacing the filtering elements; Transport systems for filters (B01D 29/09, B01D 29/70 take precedence) [5]
- 33/00 Filters with filtering elements which move during the filtering operation** (filters comprising loose filtering material moving or fluidised during filtration B01D 24/28-B01D 24/36; centrifuges B04B) [5]
- 33/01 • with translationally moving filtering elements, e.g. pistons (B01D 33/04-B01D 33/327 take precedence) [5]
- 33/03 • • with vibrating filter elements [5]
- 33/04 • with filtering bands or the like supported on cylinders which are impervious for filtering [5]
- 33/044 • with filtering bands or the like supported on cylinders which are pervious for filtering [5]
- 33/048 • • with endless filtering bands [5]
- 33/052 • • • combined with a compression device (B01D 33/64 takes precedence) [5]
- 33/056 • Construction of filtering bands or supporting belts, e.g. devices for centering, mounting or sealing the filtering bands or the supporting belts [5]
- 33/06 • with rotary cylindrical filtering surfaces, e.g. hollow drums (B01D 33/044 takes precedence)
- 33/067 • • Construction of the filtering drums, e.g. mounting or sealing arrangements [5]
- 33/073 • • arranged for inward flow filtration [5]
- 33/09 • • • with surface cells independently connected to pressure distributors [5]
- 33/11 • • arranged for outward flow filtration [5]
- 33/13 • • • with surface cells independently connected to pressure distributors [5]
- 33/15 • with rotary plane filtering surfaces [5]
- 33/17 • • with rotary filtering tables (tables divided into separately tilttable buckets, trays or like sections B01D 33/327) [5]
- 33/19 • • • the table surface being divided in successively tilted sectors or cells, e.g. for discharging the filter cake [5]
- 33/21 • • with hollow filtering discs transversely mounted on a hollow rotary shaft [5]
- 33/23 • • • Construction of discs or component sectors thereof [5]
- 33/25 • • with hollow frames axially mounted on a hollow rotary shaft [5]
- 33/27 • with rotary filtering surfaces, which are neither cylindrical nor planar, e.g. helical surfaces [5]
- 33/29 • the movement of the filter elements being a combination of movements (B01D 33/19 takes precedence) [5]
- 33/31 • • Planetary movement [5]
- 33/327 • • Tipping buckets, trays or like sections [5]
- 33/333 • with individual filtering elements moving along a closed path (tipping buckets, trays or like sections B01D 33/327) [5]
- 33/35 • with multiple filtering elements characterised by their mutual disposition (B01D 33/21 takes precedence) [5]
- 33/37 • • in parallel connection [5]
- 33/39 • • • concentrically or coaxially [5]
- 33/41 • • in series connection [5]
- 33/42 • • • concentrically or coaxially [5]
- 33/44 • Regenerating the filter material in the filter (devices for taking out of action one or more units of multi-unit filters, e.g. for regeneration, B01D 35/12) [5]
- 33/46 • • by scrapers, brushes or the like acting on the cake-side of the filtering element [5]
- 33/48 • • by flushing, e.g. counter-current air-bumps [5]
- 33/50 • • • with backwash arms, shoes or nozzles [5]
- 33/52 • • by forces created by movement of the filter element [5]
- 33/54 • • • involving vibrations [5]
- 33/56 • • • involving centrifugal force [5]
- 33/58 • Handling the filter cake in the filter for purposes other than for regenerating (B01D 33/76 takes precedence) [5]
- 33/60 • • for washing [5]
- 33/62 • • for drying [5]
- 33/64 • • • by compression [5]
- 33/66 • • • by gases or by heating [5]
- 33/68 • • Retarding cake deposition on the filter during the filtration period, e.g. using stirrers [5]
- 33/70 • having feed or discharge devices (B01D 33/82 takes precedence) [5]
- 33/72 • • for feeding [5]
- 33/74 • • for discharging filtrate [5]
- 33/76 • • for discharging the filter cake, e.g. chutes [5]
- 33/80 • Accessories [5]
- 33/82 • • Means for pressure distribution [5]
- 35/00 Filtering devices having features not specifically covered by groups B01D 24/00-B01D 33/00, or for applications not specifically covered by groups B01D 24/00-B01D 33/00; Auxiliary devices for filtration; Filter housing constructions**
- 35/01 • Devices for the removal of gas, e.g. air purge systems [5]

## B01D

- 35/02 • Filters adapted for location in special places, e.g. pipe-lines, pumps, stop-cocks (B01D 35/05 takes precedence)
- 35/027 • • rigidly mounted in or on tanks or reservoirs (B01D 35/04 takes precedence) [5]
- 35/04 • • Plug, tap, or cock filters
- 35/05 • Floating filters [5]
- 35/06 • Filters making use of electricity or magnetism (ultrafiltration, microfiltration B01D 61/14; electrodialysis, electro-osmosis B01D 61/42; combinations of filters and magnetic separators B03C 1/30) [5]
- 35/10 • Brush filters
- 35/12 • Devices for taking out of action one or more units of multi-unit filters, e.g. for regeneration
- 35/14 • Safety devices specially adapted for filtration; Devices for indicating clogging (incorporated in a throw-away filter B01D 27/10)
- 35/143 • • Filter condition indicators [5]
- 35/147 • • Bypass or safety valves [5]
- 35/15 • • Bidirectional working filters [5]
- 35/153 • • Anti-leakage or anti-return valves [5]
- 35/157 • • Flow control valves; Damping or calibrated passages [5]
- 35/16 • Cleaning-out devices
- 35/18 • Heating or cooling the filters
- 35/20 • Vibrating the filters (regenerating filter material by vibrations in filters with stationary filtering elements B01D 29/72; discharging the filter cake by vibrations in filters with moving filtering elements B01D 33/54, B01D 33/76) [5]
- 35/22 • Directing the mixture to be filtered on to the filters in a manner to clean the filters
- 35/24 • Providing loose granular material to scratch the filters clean
- 35/26 • Filters with built-in pumps
- 35/28 • Strainers not provided for elsewhere
- 35/30 • Filter housing constructions [4]
- 35/31 • • including arrangements for environmental protection, e.g. pressure resisting features [5]
- 35/32 • • • against radiation [5]
- 35/34 • • open-topped (B01D 35/31 takes precedence) [5]
- 36/00 Filter circuits or combinations of filters with other separating devices** (devices for the removal of gas, e.g. air purge systems B01D 35/01; magnetic or electrostatic separators combined with filters B03C) [4, 5]
- 36/02 • Combinations of filters of different kinds (B01D 29/50, B01D 33/35 take precedence) [4, 5]
- 36/04 • Combinations of filters with settling tanks [4]
- 37/00 Processes of filtration** (processes specially adapted for filtering gases B01D 46/00)
- 37/02 • Precoating the filtering elements or material; Addition of filter aids to the liquid being filtered
- 37/03 • using flocculating agents [5]
- 37/04 • Controlling the filtration
- 39/00 Filtering material for liquid or gaseous fluids**
- 39/02 • Loose filtering material, e.g. loose fibres
- 39/04 • • Organic material, e.g. cellulose, cotton
- 39/06 • • Inorganic material, e.g. asbestos fibres, glass beads or fibres
- 39/08 • Filter cloth, i.e. woven, knitted or interlaced material (metallic B01D 39/10)
- 39/10 • Filter screens essentially made of metal
- 39/12 • • of wire gauze; of knitted wire; of expanded metal

- 39/14 • Other self-supporting filtering material
- 39/16 • • of organic material, e.g. synthetic fibres
- 39/18 • • • the material being cellulose or derivatives thereof
- 39/20 • • of inorganic material, e.g. asbestos paper or metallic filtering material of non-woven wires

### **41/00 Regeneration of the filtering material or filter elements outside the filter for liquid or gaseous fluids**

- 41/02 • of loose filtering material
- 41/04 • of rigid self-supporting filtering material

### **43/00 Separating particles from liquids, or liquids from solids, otherwise than by sedimentation or filtration** (flotation processes B03D 1/00; drying solid materials or objects F26B)

### **Separating dispersed particles from gases or vapours**

#### **45/00 Separating dispersed particles from gases or vapours by gravity, inertia, or centrifugal forces**

- 45/02 • by utilising gravity
- 45/04 • by utilising inertia (B01D 45/12 takes precedence)
- 45/06 • • by reversal of direction of flow
- 45/08 • • by impingement against baffle separators
- 45/10 • • • which are wetted
- 45/12 • by centrifugal forces (centrifuges B04B; cyclones B04C)
- 45/14 • • generated by rotating vanes, discs, drums or brushes
- 45/16 • • generated by the winding course of the gas stream
- 45/18 • Cleaning-out devices

#### **46/00 Filters or filtering processes specially modified for separating dispersed particles from gases or vapours** (filtering elements B01D 24/00-B01D 35/00; filtering material B01D 39/00; their regeneration outside the filters B01D 41/00)

- 46/02 • Particle separators, e.g. dust precipitators, having hollow filters made of flexible material
- 46/04 • • Cleaning filters
- 46/06 • • with means keeping the working surfaces flat
- 46/08 • • • the working surfaces forming a star shape
- 46/10 • Particle separators, e.g. dust precipitators, using filter plates, sheets, or pads having plane surfaces
- 46/12 • • in multiple arrangements
- 46/14 • • arranged in a star shape
- 46/16 • • arranged on non-filtering conveyers
- 46/18 • Particle separators, e.g. dust precipitators, using filtering belts
- 46/20 • • the belts combined with drums
- 46/22 • • the belts travelling during filtering
- 46/24 • Particle separators, e.g. dust precipitators, using rigid hollow filter bodies
- 46/26 • • rotatable
- 46/28 • Particle separators, e.g. dust precipitators, using filter brushes
- 46/30 • Particle separators, e.g. dust precipitators, using loose filtering material
- 46/32 • • the material moving during filtering
- 46/34 • • • not horizontally, e.g. using shoots
- 46/36 • • • as a substantially horizontal layer, e.g. on rotary tables, drums, conveyer belts
- 46/38 • • • as fluidised bed

46/40	• Particle separators, e.g. dust precipitators, using edge filters, i.e. using contiguous impervious surfaces	53/02	• by adsorption, e.g. preparative gas chromatography
46/42	• Auxiliary equipment or operation thereof	53/04	• • with stationary adsorbents
46/44	• • controlling filtration	53/047	• • • Pressure swing adsorption [6]
46/46	• • • automatic	53/053	• • • • with storage or buffer vessel [6]
46/48	• • Removing dust other than cleaning filters	53/06	• • with moving adsorbents
46/50	• • Means for discharging electrostatic potential	53/08	• • • according to the "moving bed" method
46/52	• Particle separators, e.g. dust precipitators, using filters embodying folded material	53/10	• • • with dispersed adsorbents
46/54	• Particle separators, e.g. dust precipitators, using ultra-fine filter sheets or diaphragms	53/12	• • • • according to the "fluidised technique"
<b>47/00</b>	<b>Separating dispersed particles from gases, air or vapours by liquid as separating agent</b> (B01D 45/10 takes precedence; fractionating columns or parts thereof B01D 3/16)	53/14	• by absorption
47/02	• by passing the gas or air or vapour over or through a liquid bath	53/18	• • Absorbing units; Liquid distributors therefor (B01D 3/16, B01D 3/26, B01D 3/30 take precedence)
47/04	• by passing the gas or air or vapour through foam	53/22	• by diffusion
47/05	• by condensation of the separating agent [3]	53/24	• by centrifugal force (centrifuges B04B; cyclones B04C)
47/06	• Spray cleaning	53/26	• Drying gases or vapours
47/08	• • with rotary nozzles	53/28	• • Selection of materials for use as drying agents
47/10	• Venturi scrubbers	53/30	• Controlling by gas-analysis apparatus
47/12	• Washers with plural different washing sections (B01D 47/14 takes precedence) [3]	53/32	• by electrical effects other than those provided for in group B01D 61/00 [5]
47/14	• Packed scrubbers [3]	53/34	• Chemical or biological purification of waste gases [3, 6]
47/16	• Apparatus having rotary means, other than rotatable nozzles, for atomising the cleaning liquid	53/38	• • Removing components of undefined structure [6]
47/18	• • with horizontally-arranged shafts	53/40	• • • Acidic components (B01D 53/44 takes precedence) [6]
<b>49/00</b>	<b>Separating dispersed particles from gases, air or vapours by other methods</b>	53/42	• • • Basic components (B01D 53/44 takes precedence) [6]
49/02	• by thermal repulsion	53/44	• • • Organic components [6]
<b>50/00</b>	<b>Combinations of devices for separating particles from gases or vapours</b>	53/46	• • Removing components of defined structure [6]
<b>51/00</b>	<b>Auxiliary pretreatment of gases or vapours to be cleaned from dispersed particles [6]</b>	53/48	• • • Sulfur compounds [6]
51/02	• Amassing the particles, e.g. by flocculation	53/50	• • • • Sulfur oxides (B01D 53/60 takes precedence) [6]
51/04	• • by seeding, e.g. by adding particles	53/52	• • • • Hydrogen sulfide [6]
51/06	• • by varying the pressure of the gas or vapour	53/54	• • • • Nitrogen compounds [6]
51/08	• • • by sound or ultrasonics	53/56	• • • • Nitrogen oxides (B01D 53/60 takes precedence) [6]
51/10	• Conditioning the gas to be cleaned	53/58	• • • • Ammonia [6]
<b>53/00</b>	<b>Separation of gases or vapours; Recovering vapours of volatile solvents from gases; Chemical or biological purification of waste gases, e.g. engine exhaust gases, smoke, fumes, flue gases or aerosols</b> (recovery of volatile solvents by condensation B01D 5/00; sublimation B01D 7/00; cold traps, cold baffles B01D 8/00; separation of difficult-to-condense gases or air by liquefaction F25J 3/00) [3, 5]	53/60	• • • • Simultaneously removing sulfur oxides and nitrogen oxides [6]
<b>Note(s)</b>	Processes using enzymes or micro-organisms in order to:	53/62	• • • • Carbon oxides [6]
	i. liberate, separate or purify a pre-existing compound or composition, or to	53/64	• • • • Heavy metals or compounds thereof, e.g. mercury [6]
	ii. treat textiles or clean solid surfaces of materials	53/66	• • • • Ozone [6]
	are further classified in subclass C12S.	53/68	• • • • Halogens or halogen compounds [6]
<b>Note(s)</b>		53/70	• • • • Organic halogen compounds [6]
	Group B01D 53/34 takes precedence over groups B01D 53/02-B01D 53/32.	53/72	• • • • Organic compounds not provided for in groups B01D 53/48-B01D 53/70, e.g. hydrocarbons [6]
		53/73	• • After-treatment of removed components [6]
		53/74	• • General processes for purification of waste gases; Apparatus or devices specially adapted therefor (B01D 53/92 takes precedence) [6]
		53/75	• • • Multi-step processes [6]
		53/76	• • • Gas phase processes, e.g. by using aerosols [6]
		53/77	• • • Liquid phase processes [6]
		53/78	• • • • with gas-liquid contact [6]
		53/79	• • • • Injecting reactants [6]
		53/80	• • • Semi-solid phase processes, i.e. by using slurries [6]
		53/81	• • • Solid phase processes [6]
		53/82	• • • • with stationary reactants [6]
		53/83	• • • • with moving reactants [6]
		53/84	• • • Biological processes [6]
		53/85	• • • • with gas-solid contact [6]
		53/86	• • • Catalytic processes [6]

## B01D

- 53/88 • • • Handling or mounting catalysts [6]
- 53/90 • • • Injecting reactants [6]
- 53/92 • • of engine exhaust gases (exhaust apparatus having means for purifying or otherwise treating exhaust gases F01N 3/00) [6]
- 53/94 • • • by catalytic processes [6]
- 53/96 • • Regeneration, reactivation or recycling of reactants [6]
- 57/00 Separation, other than separation of solids, not fully covered by a single other group or subclass, e.g. B03C**
- 57/02 • by electrophoresis [3, 5]
- 59/00 Separation of different isotopes of the same chemical element**
- 59/02 • Separation by phase transition
- 59/04 • • by distillation
- 59/06 • • by fractional melting; by zone melting
- 59/08 • • by fractional crystallisation, by precipitation, by zone freezing
- 59/10 • Separation by diffusion
- 59/12 • • by diffusion through barriers
- 59/14 • • • Construction of the barrier
- 59/16 • • by thermal diffusion
- 59/18 • • by separation jets
- 59/20 • Separation by centrifuging
- 59/22 • Separation by extracting
- 59/24 • • by solvent extraction
- 59/26 • • by sorption, i.e. absorption, adsorption, persorption
- 59/28 • Separation by chemical exchange
- 59/30 • • by ion exchange
- 59/32 • • by exchange between fluids
- 59/33 • • • involving dual temperature exchange [2]
- 59/34 • Separation by photochemical methods
- 59/36 • Separation by biological methods
- 59/38 • Separation by electrochemical methods
- 59/40 • • by electrolysis
- 59/42 • • by electromigration; by electrophoresis
- 59/44 • Separation by mass spectrography (particle spectrometers or separator tubes H01J 49/00)
- 59/46 • • using only electrostatic fields
- 59/48 • • using electrostatic and magnetic fields
- 59/50 • Separation involving two or more processes covered by different groups selected from groups B01D 59/02, B01D 59/10, B01D 59/20, B01D 59/22, B01D 59/28, B01D 59/34, B01D 59/36, B01D 59/38, B01D 59/44

**Processes of separation using semi-permeable membranes, e.g. dialysis, osmosis or ultrafiltration; Apparatus specially adapted therefor; Semi-permeable membranes or their production [5]**

### **Note(s)**

In groups B01D 61/00-B01D 71/00, in the absence of an indication to the contrary, classification is made in the last appropriate place.

- 61/00 Processes of separation using semi-permeable membranes, e.g. dialysis, osmosis or ultrafiltration; Apparatus, accessories or auxiliary operations specially adapted therefor** (separation of gases or vapours by diffusion B01D 53/22) [5]
- 61/02 • Reverse osmosis; Hyperfiltration [5]
- 61/04 • • Feed pretreatment [5]

- 61/06 • • Energy recovery [5]
- 61/08 • • Apparatus therefor [5]
- 61/10 • • Accessories; Auxiliary operations [5]
- 61/12 • • Controlling or regulating [5]
- 61/14 • Ultrafiltration; Microfiltration [5]
- 61/16 • • Feed pretreatment [5]
- 61/18 • • Apparatus therefor [5]
- 61/20 • • Accessories; Auxiliary operations [5]
- 61/22 • • Controlling or regulating [5]
- 61/24 • Dialysis [5]
- 61/26 • • Dialysate solution flow, e.g. preparation, regeneration [5]
- 61/28 • • Apparatus therefor [5]
- 61/30 • • Accessories; Auxiliary operation [5]
- 61/32 • • Controlling or regulating [5]
- 61/34 • • • Measuring ultrafiltrate during dialysis [5]
- 61/36 • Pervaporation; Membrane distillation; Liquid permeation [5]
- 61/38 • Liquid-membrane separation [5]
- 61/40 • • using emulsion-type membranes [5]
- 61/42 • Electrodialysis; Electro-osmosis [5]
- 61/44 • • Ion-selective electrodialysis [5]
- 61/46 • • • Apparatus therefor [5]
- 61/48 • • • • having one or more compartments filled with ion-exchange material [5]
- 61/50 • • • • Stacks of the plate-and-frame type [5]
- 61/52 • • • Accessories; Auxiliary operation [5]
- 61/54 • • • Controlling or regulating [5]
- 61/56 • • Electro-osmotic dewatering [5]
- 61/58 • Multistep processes [5]

### **63/00 Apparatus in general for separation processes using semi-permeable membranes [5]**

- 63/02 • Hollow fibre modules [5]
- 63/04 • • comprising multiple hollow fibre assemblies [5]
- 63/06 • Tubular membrane modules [5]
- 63/08 • Flat membrane modules [5]
- 63/10 • Spiral-wound membrane modules [5]
- 63/12 • • comprising multiple spiral-wound assemblies [5]
- 63/14 • Pleat-type membrane modules [5]
- 63/16 • Rotary, reciprocated or vibrated modules [5]

### **65/00 Accessories or auxiliary operations, in general, for separation processes or apparatus using semi-permeable membranes [5]**

- 65/02 • Membrane cleaning or sterilisation [5]
- 65/04 • • with movable bodies, e.g. foam balls [5]
- 65/06 • • with special washing compositions [5]
- 65/08 • Prevention of membrane fouling or of concentration polarisation [5]
- 65/10 • Testing of membranes or membrane apparatus; Detecting or repairing leaks [5]

### **67/00 Processes specially adapted for manufacturing semi-permeable membranes for separation processes or apparatus [5]**

### **69/00 Semi-permeable membranes for separation processes or apparatus characterised by their form, structure or properties; Manufacturing processes specially adapted therefor [5]**

#### **Note(s)**

1. In this group, the following term is used with the meaning indicated:



	<ul style="list-style-type: none"> <li>• "properties" covers those of a mechanical, physical or chemical nature.</li> </ul>		
	2. Manufacturing processes, if considered of interest, are also classified in group B01D 67/00.		
69/02	• characterised by their properties [5]	71/26	• • Polyalkenes [5]
69/04	• Tubular membranes [5]	71/28	• • Polymers of vinyl aromatic compounds [5]
69/06	• Flat membranes [5]	71/30	• • Polyalkenyl halides [5]
69/08	• Hollow fibre membranes (manufacture of hollow fibres D01D 5/24, D01F 1/08) [5]	71/32	• • • containing fluorine atoms [5]
69/10	• Supported membranes; Membrane supports [5]	71/34	• • • • Polyvinylidene fluoride [5]
69/12	• Composite membranes; Ultra-thin membranes [5]	71/36	• • • • Polytetrafluoroethene [5]
69/14	• Dynamic membranes [5]	71/38	• • Polyalkenylalcohols; Polyalkenylesters; Polyalkenylethers; Polyalkenylaldehydes; Polyalkenylketones; Polyalkenylacetals; Polyalkenylketals [5]
<b>71/00</b>	<b>Semi-permeable membranes for separation processes or apparatus characterised by the material; Manufacturing processes specially adapted therefor [5]</b>	71/40	• • Polymers of unsaturated acids or derivatives thereof, e.g. salts, amides, imides, nitriles, anhydrides, esters [5]
	<b>Note(s)</b>	71/42	• • Polymers of nitriles, e.g. polyacrylonitrile [5]
	1. In this group, if the material is a composition it is classified according to the constituent present in highest proportion. This constituent is classified according to the last place rule (see Note before group B01D 61/00). If there is more than one constituent present in equal highest proportions, then each of these constituents is classified according to the last place rule.	71/44	• • Polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of groups B01D 71/26-B01D 71/42 [5]
	2. Manufacturing processes, if considered of interest, are also classified in group B01D 67/00.	71/46	• • Epoxy resins [5]
		71/48	• • Polyesters [5]
		71/50	• • Polycarbonates [5]
		71/52	• • Polyethers [5]
		71/54	• • Polyureas; Polyurethanes [5]
		71/56	• • Polyamides, e.g. polyester-amides [5]
		71/58	• • Other polymers having nitrogen in the main chain, with or without oxygen or carbon only [5]
		71/60	• • • Polyamines [5]
		71/62	• • • Polycondensates having nitrogen-containing heterocyclic rings in the main chain [5]
		71/64	• • • Polyimides; Polyamide-imides; Polyester-imides; Polyamide acids or similar polyimide precursors [5]
71/02	• Inorganic material [5]	71/66	• • Polymers having sulfur in the main chain, with or without nitrogen, oxygen or carbon only [5]
71/04	• • Glass [5]	71/68	• • • Polysulfones; Polyethersulfones [5]
71/06	• Organic material [5]	71/70	• • Polymers having silicon in the main chain, with or without sulfur, nitrogen, oxygen or carbon only [5]
71/08	• • Polysaccharides [5]	71/72	• • Macromolecular compounds obtained otherwise than by reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of groups B01D 71/46-B01D 71/70 [5]
71/10	• • • Cellulose; Modified cellulose [5]	71/74	• • Natural macromolecular material or derivatives thereof (B01D 71/08, B01D 71/24 take precedence) [5]
71/12	• • • Cellulose derivatives [5]	71/76	• • Macromolecular material not specifically provided for in a single one of groups B01D 71/08-B01D 71/74 (rubbers in general B01D 71/24) [5]
71/14	• • • • Esters of organic acids [5]	71/78	• • • Graft polymers [5]
71/16	• • • • Cellulose acetate [5]	71/80	• • • Block polymers [5]
71/18	• • • • Mixed esters, e.g. cellulose acetate-butyrate [5]	71/82	• • • characterised by the presence of specified groups, e.g. introduced by chemical after-treatment [5]
71/20	• • • • Esters of inorganic acids, e.g. cellulose nitrate [5]		
71/22	• • • • Cellulose ethers [5]		
71/24	• • Rubbers [5]		
	<b>Note(s)</b>		
	In this group the following term is used with the meaning indicated:		
	• "rubber" covers:		
	a. natural or conjugated diene rubber;		
	b. rubber in general (for specific rubber, see the group provided for such macromolecular compound).		

# B01F MIXING, e.g. DISSOLVING, EMULSIFYING, DISPERSING (mixing paints B44D 3/06)

## Note(s)

In this subclass, the following term or expression is used with the meaning indicated:

- "mixing" covers stirring of a single material.

## Subclass index

DISSOLVING.....	1/00
MIXING, DISPERSING, EMULSIFYING	
Processes.....	3/00

## B01F

### Apparatus

flow mixers.....	5/00
with rotary action.....	7/00, 9/00
other mixers.....	11/00, 13/00
accessories.....	15/00
EMULSIFYING OR DISPERSING AGENTS.....	17/00

**1/00 Dissolving** (separating by dissolving B01D; dissolving to effect cooling F25D 5/00) [2]

**3/00 Mixing, e.g. dispersing, emulsifying, according to the phases to be mixed**

- 3/02 • gases with gases or vapours
- 3/04 • gases or vapours with liquids (mixing non-alcoholic beverages with gases A23L 2/54)
- 3/06 • gases or vapours with solids
- 3/08 • liquids with liquids; Emulsifying
- 3/10 • • Mixing very viscous liquids
- 3/12 • liquids with solids (displacing one liquid by another in dispersions of solids in liquids B01D 12/00)
- 3/14 • • Mixing very viscous liquids with solids
- 3/18 • solid with solids
- 3/20 • Pretreatment of the materials to be mixed
- 3/22 • Aftertreatment of the mixture

### Mixers

**5/00 Flow mixers** (sprayers, atomisers B05B); **Mixers for falling materials, e.g. solid particles** (B01F 13/04 takes precedence; centrifugal mixers B04)

- 5/02 • Jet mixers
- 5/04 • Injector mixers
- 5/06 • Mixers in which the components are pressed together through slits, orifices, or screens (turbo-mixers B01F 5/16; colloid-mills B02C; mixing valves F16K 11/00)
- 5/08 • • Homogenising or emulsifying nozzles
- 5/10 • Circulation mixers
- 5/12 • Pump mixers
- 5/14 • • of the gear type
- 5/16 • • Turbo-mixers
- 5/18 • Spray-mixers
- 5/20 • • with nozzles
- 5/22 • • with rotary discs
- 5/24 • Falling particle mixers with repeated action
- 5/26 • Falling particle mixers with moving means, e.g. stirrers for increasing the mixing

**7/00 Mixers with rotary stirring devices in fixed receptacles; Kneaders** (B01F 13/04 takes precedence)

- 7/02 • with stirrers rotating about a horizontal or inclined axis
- 7/04 • • with paddles or arms
- 7/06 • • with propellers
- 7/08 • • with helices
- 7/10 • • with rotary discs
- 7/12 • • with cylinders
- 7/14 • • with stirrers having planetary motion
- 7/16 • with stirrers rotating about a vertical axis
- 7/18 • • with paddles or arms
- 7/20 • • • with fixed axis
- 7/22 • • with propellers

7/24 • • with helices

7/26 • • with rotary discs

7/28 • • with cylinders

7/30 • • with stirrers having planetary motion

7/32 • • with openwork frames or cages

**9/00 Mixers with rotating receptacles** (B01F 13/04 takes precedence)

- 9/02 • rotating about a horizontal or inclined axis, e.g. drum mixers
- 9/04 • • without bars
- 9/06 • • with fixed bars
- 9/08 • • with rotating stirring devices
- 9/10 • rotating about a vertical axis
- 9/12 • • with paddles or arms
- 9/14 • • with propellers
- 9/16 • • with helices
- 9/18 • • with rotary discs
- 9/20 • • with cylinders
- 9/22 • with stirrers having planetary motion

**11/00 Mixers with shaking, oscillating, or vibrating mechanisms** (B01F 13/04 takes precedence)

- 11/02 • Mixing by means of ultrasonic vibrations
- 11/04 • with pendulum stirrers

**13/00 Other mixers; Mixing plant, including combinations of dissimilar mixers**

- 13/02 • Mixers with gas agitation, e.g. with air supply tubes
- 13/04 • Mixers combined with safety devices
- 13/06 • Mixers adapted for working at sub- or super-atmospheric pressure
- 13/08 • Magnetic mixers
- 13/10 • Mixing plant, including combinations of dissimilar mixers

**15/00 Accessories for mixers**

- 15/02 • Feed or discharge mechanisms
- 15/04 • Forming a predetermined ratio of the substances to be mixed (controlling ratio of two or more flows of fluid or fluent material G05D 11/02)
- 15/06 • Heating or cooling systems

**17/00 Use of substances as emulsifying, wetting, dispersing, or foam-producing agents** (flotation agents B03D 1/001; used for particular applications, see the relevant classes, e.g. use of substances as detergents C11D) [3, 5]

17/02 • Alkyl sulfonates or sulfuric acid ester salts derived from monohydric alcohols

17/04 • Sulfonates or sulfuric acid ester salts derived from polyhydric alcohols or amino alcohols or derivatives thereof (sulfated or sulfonated fatty oils B01F 17/08)

17/06 • Esters of higher fatty acids with hydroxyalkylated sulfonic acids or salts thereof

17/08	• Sulfation or sulfonation products of fats, oils, waxes, or higher fatty acids or esters thereof with monovalent alcohols	17/30	• Proteins; Protein hydrolysates
17/10	• Derivatives of low-molecular-weight sulfocarboxylic acids or sulfopolycarboxylic acids	17/32	• Heterocyclic compounds
17/12	• Sulfonates of aromatic or alkylated aromatic compounds	17/34	• Higher-molecular-weight carboxylic acid esters (B01F 17/06 takes precedence)
17/14	• Derivatives of phosphoric acid	17/36	• • Esters of polycarboxylic acids
17/16	• Amines or polyamines	17/38	• Alcohols, e.g. oxidation products of paraffins
17/18	• Quaternary ammonium compounds	17/40	• Phenols
17/20	• Phosphonium and sulfonium compounds	17/42	• Ethers, e.g. polyglycol ethers of alcohols or phenols
17/22	• Amides or hydrazides	17/44	• • Ether carboxylic acids
17/24	• • Amides of higher fatty acids with aminoalkylated sulfonic acids	17/46	• • Ethers of aminoalcohols
17/26	• Sulfonamides	17/48	• • Cellulose ethers
17/28	• Aminocarboxylic acids (protein hydrolysates B01F 17/30)	17/50	• Derivatives of lignin
		17/52	• Natural or synthetic resins or their salts
		17/54	• Silicon compounds
		17/56	• Glucosides; Mucilage; Saponines

**B01J** **CHEMICAL OR PHYSICAL PROCESSES, e.g. CATALYSIS, COLLOID CHEMISTRY; THEIR RELEVANT APPARATUS** (processes or apparatus for specific applications, see the relevant places for these processes or apparatus, e.g. F26B 3/08) [2]

#### Note(s)

- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "solid particles" includes such particles whether catalysts, reactants or inert in solid, semi-solid or pasty state;
  - "fluidised particles" means finely divided solid particles lifted and agitated by a stream of fluid;
  - "fluidised-bed technique" means fluid-solid contacting technique in which finely divided particles are lifted and agitated by a rising stream of fluid, said stream having such a speed as to form a lower dense phase (the "bed") and an upper dilute fluidised phase of "fluidised particles";
  - "processes conducted in the presence of solid particles" does not include processes wherein the only solid particles present are formed during the reaction.
- In this subclass, tradenames that are often found in scientific and patent literature have been used in order to define precisely the scope of the groups.

#### Subclass index

CHEMICAL, PHYSICAL, OR PHYSICO-CHEMICAL PROCESSES OR APPARATUS.....	3/00, 4/00, 6/00, 7/00, 8/00, 19/00
CHEMICAL PROCESSES INVOLVING A GAS.....	8/00, 10/00, 12/00, 15/00
CHEMICAL PROCESSES INVOLVING A LIQUID.....	8/00, 10/00, 14/00, 16/00
CATALYSTS	
containing elements or inorganic compounds.....	21/00, 23/00, 27/00
Raney type.....	25/00
Molecular sieves.....	29/00
containing hydrides, coordination complexes or organic compounds.....	31/00
Catalyst carriers in general.....	32/00
Preparation.....	33/00-37/00
Regeneration or reactivation of catalysts, in general.....	38/00
SORBENT, FILTER AID COMPOSITIONS.....	20/00
ION EXCHANGE PROCESSES.....	39/00-49/00
COLLOID CHEMISTRY.....	13/00
GRANULATION.....	2/00

**2/00** **Processes or devices for granulating materials, in general** (granulating metals B22F 9/00, slag C04B 5/02, ores or scrap C22B 1/14; mechanical aspects of working of plastics or substances in a plastic state to make granules B29B 9/00; processes for granulating fertilisers characterised by their chemical constitution, see the relevant groups in C05B-C05G; chemical aspects of powdering or granulating of macromolecular substances C08J 3/12); **Rendering particulate materials free flowing in general, e.g. making them hydrophobic** [4]

- |      |   |
|------|---|
| 2/02 | • by dividing the liquid material into drops, e.g. by spraying, and solidifying the drops (evaporating by spraying B01D 1/16) |
| 2/04 | • • in a gaseous medium   |
| 2/06 | • • in a liquid medium  |
| 2/08 | • • • Gelation of a colloidal solution  |
| 2/10 | • in stationary drums or troughs, provided with kneading or mixing appliances   |
| 2/12 | • in rotating drums   |
| 2/14 | • in rotating dishes or pans  |
| 2/16 | • by suspending the powder material in a gas, e.g. in fluidised beds or as a falling curtain                                  |

- 2/18 • using a vibrating apparatus
- 2/20 • by expressing the material, e.g. through sieves and fragmenting the extruded length
- 2/22 • by pressing in moulds or between rollers
- 2/24 • Obtaining flakes by scraping a solid layer from a surface
- 2/26 • on endless conveyer belts
- 2/28 • using special binding agents
- 2/30 • using agents to prevent the granules sticking together; Rendering particulate materials free flowing in general, e.g. making them hydrophobic [4]
- 3/00 Processes of utilising sub-atmospheric or super-atmospheric pressure to effect chemical or physical change of matter; Apparatus therefor** (apparatus for compacting or sintering of metal powders B22F 3/00; pressure vessels in general F16J 12/00; pressure vessels for containing or storing compressed, liquefied or solidified gases F17C; pressure vessels for nuclear reactors G21C) [2]
- 3/02 • Feed or outlet devices therefor
- 3/03 • Pressure vessels, or vacuum vessels, having closure members or seals specially adapted therefor [3]
- 3/04 • Pressure vessels, e.g. autoclaves [2]
- 3/06 • Processes using ultra-high pressure, e.g. for the formation of diamonds; Apparatus therefor, e.g. moulds, dies (B01J 3/04 takes precedence; presses in general B30B) [2]
- 3/08 • • Application of shock waves for chemical reactions or for modifying the crystal structure of substances (blasting F42D) [3]
- 4/00 Feed devices; Feed or outlet regulating devices** (feed or outlet devices for pressure vessels B01J 3/02)
- 4/02 • for feeding measured quantities of reagents
- 4/04 • using osmotic pressure [4]
- 6/00 Calcining; Fusing**
- 7/00 Apparatus for generating gases** (production of inert gas mixtures B01J 19/14; for generating specific gases, see the relevant subclasses, e.g. C01B, C10J)
- 7/02 • by wet methods
- 8/00 Chemical or physical processes in general, conducted in the presence of fluids and solid particles; Apparatus for such processes** (processes or devices for granulating material B01J 2/00; furnaces F27B) [2]
- 8/02 • with stationary particles, e.g. in fixed beds [2]
- 8/04 • • the fluid passing successively through two or more beds [2]
- 8/06 • • in tube reactors; the solid particles being arranged in tubes [2]
- 8/08 • with moving particles (with fluidised particles B01J 8/18) [2]
- 8/10 • • moved by stirrers or by rotary drums or rotary receptacles [2]
- 8/12 • • moved by gravity in a downward flow [2]
- 8/14 • • moving in free vortex flow apparatus (free vortex flow apparatus in general B04C) [2]
- 8/16 • with particles being subjected to vibrations or pulsations (B01J 8/40 takes precedence) [2]
- 8/18 • with fluidised particles [2]
- 8/20 • • with liquid as a fluidising medium [2]
- 8/22 • • gas being introduced into the liquid [2]
- 8/24 • • according to "fluidised-bed" technique (B01J 8/20 takes precedence; combustion apparatus in which combustion takes place in a fluidised bed of fuel or other particles F23C 10/00) [2]
- 8/26 • • • with two or more fluidised beds, e.g. reactor and regeneration installations [2]
- 8/28 • • • • the one above the other [2]
- 8/30 • • • • the edge of a lower bed projecting beyond the edge of the superjacent bed [2]
- 8/32 • • • with introduction into the fluidised bed of more than one kind of moving particles [2]
- 8/34 • • • with stationary packing material in the fluidised bed, e.g. bricks, wire rings, baffles [2]
- 8/36 • • • with fluidised bed through which there is an essentially horizontal flow of particles [2]
- 8/38 • • • with fluidised bed containing a rotatable device or being subject to rotation [2]
- 8/40 • • • with fluidised bed subjected to vibrations or pulsations [2]
- 8/42 • • • with fluidised bed subjected to electric current or to radiations [2]
- 8/44 • • • Fluidisation grids [2]
- 8/46 • • • for treatment of endless filamentary, band or sheet material [2]
- 10/00 Chemical processes in general for reacting liquid with gaseous media other than in the presence of solid particles, or apparatus specially adapted therefor** (B01J 19/08 takes precedence; separation, e.g. distillation, also combined with chemical reactions B01D) [3]
- 10/02 • of the thin-film type [3]
- 12/00 Chemical processes in general for reacting gaseous media with gaseous media; Apparatus specially adapted therefor** (B01J 3/08, B01J 8/00, B01J 19/08 take precedence) [3]
- 12/02 • for obtaining at least one reaction product which, at normal temperature, is in the solid state [3]
- 13/00 Colloid chemistry, e.g. the production of colloidal materials or their solutions, not otherwise provided for; Making microcapsules or microballoons** (use of substances as emulsifying, wetting, dispersing or foam producing agents B01F 17/00)
- 13/02 • Making microcapsules or microballoons
- 13/04 • • by physical processes, e.g. drying, spraying [5]
- 13/06 • • by phase separation [5]
- 13/08 • • • Simple coacervation, i.e. addition of highly hydrophilic material [5]
- 13/10 • • • Complex coacervation, i.e. interaction of oppositely charged particles [5]
- 13/12 • • • removing solvent from the wall-forming material solution [5]
- 13/14 • • • Polymerisation, crosslinking [5]
- 13/16 • • • • Interfacial polymerisation [5]
- 13/18 • • • • In situ polymerisation with all reactants being present in the same phase [5]
- 13/20 • • After-treatment of capsule walls, e.g. hardening [5]
- 13/22 • • • Coating [5]
- 14/00 Chemical processes in general for reacting liquids with liquids; Apparatus specially adapted therefor** (B01J 8/00, B01J 19/08 take precedence) [3]

- 15/00 Chemical processes in general for reacting gaseous media with non-particulate solids, e.g. sheet material; Apparatus specially adapted therefor** (B01J 19/08 takes precedence) [3]
- 16/00 Chemical processes in general for reacting liquids with non-particulate solids, e.g. sheet material; Apparatus specially adapted therefor** (B01J 19/08 takes precedence) [3]
- 19/00 Chemical, physical, or physico-chemical processes in general** (physical treatment of fibres, threads, yarns, fabrics, feathers or fibrous goods made from such materials, *see* the relevant places for such treatment, e.g. D06M 10/00); **Their relevant apparatus** (packings, fillings or grids specially adapted for biological treatment of water, waste water or sewage C02F 3/10; splashing boards or grids specially adapted for trickle coolers F28F 25/08) [3]
- 19/02 • Apparatus characterised by being constructed of material selected for its chemically-resistant properties (refractory details of furnaces F27D) [3]
- 19/06 • Solidifying liquids (making micro-capsules B01J 13/02) [3]
- 19/08 • Processes employing the direct application of electric or wave energy, or particle radiation; Apparatus therefor (application of shock waves B01J 3/08; generating or handling plasma H05H 1/00) [3]
- 19/10 • • employing sonic or ultrasonic vibrations (for auxiliary pretreatment of gases or vapours to be cleaned B01D 51/08; for cleaning B08B 3/12) [3]
- 19/12 • • employing electromagnetic waves [3]
- 19/14 • Production of inert gas mixtures; Use of inert gases in general (apparatus for generating gases B01J 7/00; separation of gases or vapours B01D 53/00) [3]
- 19/16 • Preventing evaporation or oxidation of non-metallic liquids by applying a floating layer, e.g. of micro-balloons [3]
- 19/18 • Stationary reactors having moving elements inside (B01J 19/08, B01J 19/26 take precedence) [3]
- 19/20 • • in the form of helices, e.g. screw reactors (thin-film reactors B01J 10/02) [3]
- 19/22 • • in the form of endless belts [3]
- 19/24 • Stationary reactors without moving elements inside (B01J 19/08, B01J 19/26 take precedence; with stationary particles B01J 8/02) [3]
- 19/26 • Nozzle-type reactors, i.e. the distribution of the initial reactants within the reactor is effected by their introduction or injection through nozzles [3]
- 19/28 • Moving reactors, e.g. rotary drums (B01J 19/08 takes precedence; centrifuges B04B; rotary drum furnaces F27B 7/00) [3]
- 19/30 • Loose or shaped packing elements, e.g. Raschig rings or Berl saddles, for pouring into the apparatus for mass or heat transfer [5]
- 19/32 • Packing elements in the form of grids or built-up elements for forming a unit or module inside the apparatus for mass or heat transfer [5]
- Solid sorbent compositions; Filter aid compositions; Sorbents for chromatography; Catalysts** [3]
- Note(s)**
1. In groups B01J 20/00-B01J 31/00, metal salts having an anion composed of metal and oxygen only, e.g. molybdates, are considered as chemically bound mixtures of the component metal oxides.
2. Attention is drawn to the definitions of groups of chemical elements following the title of section C.
3. In group B01J 20/00 and in each set of groups B01J 21/00-B01J 31/00 and B01J 32/00-B01J 38/00, in the absence of an indication to the contrary, classification is made in the last appropriate place.
4. Pure compounds or elements, or their recovery from solid sorbent compositions, filter aid compositions, or catalysts, are classified in the appropriate subclass for chemical compounds or elements. However, when it is explicitly stated that the pure compound or element, in a particular form, is especially useful as a solid sorbent, filter aid, or catalyst, it is further classified in group B01J 20/00 or B01J 35/00.
- 20/00 Solid sorbent compositions or filter aid compositions; Sorbents for chromatography; Processes for preparing, regenerating or reactivating thereof** (use of solid sorbent compositions in liquid separation B01D 15/00; use of filter aid compositions B01D 37/02; use of sorbent compositions in gas separation B01D 53/02, B01D 53/14) [3, 2006.01]
- 20/02 • comprising inorganic material [3]
- 20/04 • • comprising compounds of alkali metals, alkaline earth metals or magnesium [3]
- 20/06 • • comprising oxides or hydroxides of metals not provided for in group B01J 20/04 [3]
- 20/08 • • • comprising aluminium oxide or hydroxide; comprising bauxite [3]
- 20/10 • • comprising silica or silicate [3]
- 20/12 • • • Naturally occurring clays or bleaching earth [3]
- 20/14 • • • Diatomaceous earth [3]
- 20/16 • • • • Alumino-silicates (B01J 20/12 takes precedence) [3]
- 20/18 • • • • Synthetic zeolitic molecular sieves [3]
- 20/20 • • comprising free carbon; comprising carbon obtained by carbonising processes (active carbon C01B 31/08) [3]
- 20/22 • comprising organic material [3]
- 20/24 • • Naturally occurring macromolecular compounds, e.g. humic acids or their derivatives [3]
- 20/26 • • Synthetic macromolecular compounds [3]
- 20/28 • characterised by their form or physical properties [3]
- 20/281 • Sorbents specially adapted for preparative, analytical or investigative chromatography [2006.01]
- 20/282 • • Porous sorbents (ion exchange B01J 39/00-B01J 41/00) [2006.01]
- 20/283 • • • based on silica [2006.01]
- 20/284 • • • based on alumina [2006.01]
- 20/285 • • • based on polymers [2006.01]
- 20/286 • • Phases chemically bonded to a substrate, e.g. to silica or to polymers [2006.01]
- 20/287 • • • Non-polar phases; Reversed phases [2006.01]
- 20/288 • • • Polar phases [2006.01]
- 20/289 • • • bonded via a spacer [2006.01]
- 20/29 • • Chiral phases [2006.01]
- 20/291 • • Gel sorbents [2006.01]
- 20/292 • • Liquid sorbents [2006.01]
- 20/30 • Processes for preparing, regenerating or reactivating [3]
- 20/32 • • Impregnating or coating [3]
- 20/34 • • Regenerating or reactivating [3]

**Note(s)**

1. In groups B01J 21/00-B01J 38/00, the following term is used with the meaning indicated:
    - "catalyst" covers also a carrier forming part of the catalyst.
  2. Classification of the:
    - carriers;
    - forms or physical properties;
    - preparation or activation;
    - regeneration or reactivation
- of catalysts according to more than one of main groups B01J 21/00-B01J 31/00 is made in the following general groups:
- B01J 32/00 for such carriers;
  - B01J 35/00 for such forms or physical properties;
  - B01J 37/00 for such preparation or activation;
  - B01J 38/00 for such regeneration or reactivation.

**21/00 Catalysts comprising the elements, oxides or hydroxides of magnesium, boron, aluminium, carbon, silicon, titanium, zirconium or hafnium [2]**

- 21/02 • Boron or aluminium; Oxides or hydroxides thereof [2]
- 21/04 • • Alumina [2]
- 21/06 • Silicon, titanium, zirconium or hafnium; Oxides or hydroxides thereof [2]
- 21/08 • • Silica [2]
- 21/10 • Magnesium; Oxides or hydroxides thereof [2]
- 21/12 • Silica and alumina [2]
- 21/14 • Silica and magnesia [2]
- 21/16 • Clays or other mineral silicates [2]
- 21/18 • Carbon [2]
- 21/20 • Regeneration or reactivation [2]

**23/00 Catalysts comprising metals or metal oxides or hydroxides, not provided for in group B01J 21/00 (B01J 21/16 takes precedence) [2]**

- 23/02 • of the alkali- or alkaline earth metals or beryllium [2]
- 23/04 • • Alkali metals [2]
- 23/06 • of zinc, cadmium or mercury [2]
- 23/08 • of gallium, indium or thallium [2]
- 23/10 • of rare earths [2]
- 23/12 • of actinides [2]
- 23/14 • of germanium, tin or lead [2]
- 23/16 • of arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 23/18 • • Arsenic, antimony or bismuth [2]
- 23/20 • • Vanadium, niobium or tantalum [2]
- 23/22 • • • Vanadium [2]
- 23/24 • • Chromium, molybdenum or tungsten [2]
- 23/26 • • • Chromium [2]
- 23/28 • • • Molybdenum [2]
- 23/30 • • • Tungsten [2]
- 23/31 • • • combined with bismuth [3]
- 23/32 • • Manganese, technetium or rhenium [2]
- 23/34 • • • Manganese [2]
- 23/36 • • • Rhenium [2]
- 23/38 • of noble metals [2]
- 23/40 • • of the platinum group metals [2]
- 23/42 • • • Platinum [2]
- 23/44 • • • Palladium [2]
- 23/46 • • • Ruthenium, rhodium, osmium or iridium [2]

- 23/48 • • Silver or gold [2]
- 23/50 • • • Silver [2]
- 23/52 • • • Gold [2]
- 23/54 • • combined with metals, oxides or hydroxides provided for in groups B01J 23/02-B01J 23/36 [2]
- 23/56 • • • Platinum group metals [2]
- 23/58 • • • • with alkali- or alkaline earth metals or beryllium [2, 6]
- 23/60 • • • • with zinc, cadmium or mercury [2]
- 23/62 • • • • with gallium, indium, thallium, germanium, tin or lead [2]
- 23/63 • • • • with rare earths or actinides [6]
- 23/64 • • • • with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 23/644 • • • • • Arsenic, antimony or bismuth [6]
- 23/648 • • • • • Vanadium, niobium or tantalum [6]
- 23/652 • • • • • Chromium, molybdenum or tungsten [6]
- 23/656 • • • • • Manganese, technetium or rhenium [6]
- 23/66 • • • Silver or gold [2]
- 23/68 • • • • with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 23/70 • of the iron group metals or copper [2]
- 23/72 • • Copper [2]
- 23/74 • • Iron group metals [2]
- 23/745 • • • Iron [6]
- 23/75 • • • Cobalt [6]
- 23/755 • • • Nickel [6]
- 23/76 • • combined with metals, oxides or hydroxides provided for in groups B01J 23/02-B01J 23/36 [2]
- 23/78 • • • with alkali- or alkaline earth metals or beryllium [2, 6]
- 23/80 • • • with zinc, cadmium or mercury [2]
- 23/825 • • • with gallium, indium or thallium [6]
- 23/83 • • • with rare earths or actinides [6]
- 23/835 • • • with germanium, tin or lead [6]
- 23/84 • • • with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 23/843 • • • • Arsenic, antimony or bismuth [6]
- 23/847 • • • • Vanadium, niobium or tantalum [6]
- 23/85 • • • • Chromium, molybdenum, or tungsten [3]
- 23/86 • • • • • Chromium [2, 3]
- 23/88 • • • • • Molybdenum [2, 3]
- 23/881 • • • • • • and iron [6]
- 23/882 • • • • • • and cobalt [6]
- 23/883 • • • • • • and nickel [6]
- 23/885 • • • • • • and copper [6]
- 23/887 • • • • • • containing in addition other metals, oxides or hydroxides provided for in groups B01J 23/02-B01J 23/36 [6]
- 23/888 • • • • • Tungsten [6]
- 23/889 • • • • • Manganese, technetium or rhenium [6]
- 23/89 • • combined with noble metals [3]
- 23/90 • Regeneration or reactivation [2]
- 23/92 • • of catalysts comprising metals, oxides or hydroxides provided for in groups B01J 23/02-B01J 23/36 [2]
- 23/94 • • of catalysts comprising metals, oxides or hydroxides of the iron group metals or copper [2]

- 23/96 • • of catalysts comprising metals, oxides or hydroxides of the noble metals [2]
- 25/00 Catalysts of the Raney type [2]**
- 25/02 • Raney nickel [2]
- 25/04 • Regeneration or reactivation [2]
- 27/00 Catalysts comprising the elements or compounds of halogens, sulfur, selenium, tellurium, phosphorus or nitrogen; Catalysts comprising carbon compounds [4]**
- Note(s)**
- Metal catalysts or metal oxide catalysts activated or conditioned by halogens, sulfur or phosphorus, or compounds thereof are classified in the appropriate groups for metal catalysts or metal oxide catalysts.
- 27/02 • Sulfur, selenium or tellurium; Compounds thereof [4]
- 27/04 • • Sulfides [2]
- 27/043 • • • with iron group metals or platinum group metals [4]
- 27/045 • • • • Platinum group metals [4]
- 27/047 • • • with chromium, molybdenum, tungsten or polonium [4]
- 27/049 • • • • with iron group metals or platinum group metals [4]
- 27/051 • • • • Molybdenum [4]
- 27/053 • • Sulfates [4]
- 27/055 • • • with alkali metals, copper, gold or silver [4]
- 27/057 • • Selenium or tellurium; Compounds thereof [4]
- 27/06 • Halogens; Compounds thereof [4]
- 27/08 • • Halides [2]
- 27/10 • • • Chlorides [2]
- 27/12 • • • Fluorides [2]
- 27/122 • • • of copper [4]
- 27/125 • • with scandium, yttrium, aluminium, gallium, indium or thallium [4]
- 27/128 • • with iron group metals or platinum group metals [4]
- 27/13 • • • Platinum group metals [4]
- 27/132 • • with chromium, molybdenum, tungsten or polonium [4]
- 27/135 • • with titanium, zirconium, hafnium, germanium, tin or lead [4]
- 27/138 • • with alkaline earth metals, magnesium, beryllium, zinc, cadmium or mercury [4]
- 27/14 • Phosphorus; Compounds thereof [4]
- 27/16 • • containing oxygen [2]
- 27/18 • • • with metals [2]
- 27/182 • • with silicon [4]
- 27/185 • • with iron group metals or platinum group metals [4]
- 27/186 • • with arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [5]
- 27/187 • • • with manganese, technetium or rhenium [5]
- 27/188 • • • with chromium, molybdenum, tungsten or polonium [4, 5]
- 27/19 • • • • Molybdenum [4, 5]
- 27/192 • • • • • with bismuth [4, 5]
- 27/195 • • • with vanadium, niobium or tantalum [4, 5]
- 27/198 • • • • Vanadium [4, 5]
- 27/199 • • • • • with chromium, molybdenum, tungsten or polonium [5]
- 27/20 • Carbon compounds [2]
- 27/22 • • Carbides [2]
- 27/224 • • • Silicon carbide [4]
- 27/228 • • • • with phosphorus, arsenic, antimony or bismuth [4]
- 27/232 • • Carbonates [4]
- 27/236 • • • Hydroxy carbonates [4]
- 27/24 • Nitrogen compounds [2]
- 27/25 • • Nitrates [4]
- 27/26 • • Cyanides [2]
- 27/28 • Regeneration or reactivation [2]
- 27/30 • • of catalysts comprising compounds of sulfur, selenium or tellurium [2]
- 27/32 • • of catalysts comprising compounds of halogens [2]
- 29/00 Catalysts comprising molecular sieves [2]**
- Note(s)**
- In this group, the following term is used with the meaning indicated:
- "zeolites" means:
    - i. crystalline aluminosilicates with base-exchange and molecular sieve properties, having three dimensional, microporous lattice framework structure of tetrahedral oxide units;
    - ii. compounds isomorphous to those of the former category, wherein the aluminium or silicon atoms in the framework are partly or wholly replaced by atoms of other elements, e.g. by gallium, germanium, phosphorus or boron.
- 29/03 • not having base-exchange properties [6]
- 29/035 • • Crystalline silica polymorphs, e.g. silicalites [6]
- 29/04 • having base-exchange properties, e.g. crystalline zeolites, pillared clays [2, 6]
- 29/06 • • Crystalline aluminosilicate zeolites; Isomorphous compounds thereof [2]
- 29/064 • • • containing iron group metals, noble metals or copper [6]
- 29/068 • • • • Noble metals [6]
- 29/072 • • • • Iron group metals or copper [6]
- 29/076 • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/08 • • • of the faujasite type, e.g. type X or Y [2]
- 29/10 • • • • containing iron group metals, noble metals or copper [2]
- 29/12 • • • • • Noble metals [2]
- 29/14 • • • • • Iron group metals or copper [2]
- 29/16 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 29/18 • • • of the mordenite type [2]
- 29/20 • • • • containing iron group metals, noble metals or copper [2]
- 29/22 • • • • • Noble metals [2]
- 29/24 • • • • • Iron group metals or copper [2]
- 29/26 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [2]
- 29/40 • • • of the pentasil type, e.g. types ZSM-5, ZSM-8 or ZSM-11 [6]

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- 29/42 • • • • containing iron group metals, noble metals or copper [6]
- 29/44 • • • • • Noble metals [6]
- 29/46 • • • • • Iron group metals or copper [6]
- 29/48 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/50 • • • • of the erionite or offretite type, e.g. zeolite T [6]
- 29/52 • • • • containing iron group metals, noble metals or copper [6]
- 29/54 • • • • • Noble metals [6]
- 29/56 • • • • • Iron group metals or copper [6]
- 29/58 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/60 • • • • of the type L [6]
- 29/61 • • • • containing iron group metals, noble metals or copper [6]
- 29/62 • • • • • Noble metals [6]
- 29/63 • • • • • Iron group metals or copper [6]
- 29/64 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/65 • • • • of the ferrierite type, e.g. types ZSM-21, ZSM-35 or ZSM-38 [6]
- 29/66 • • • • containing iron group metals, noble metals or copper [6]
- 29/67 • • • • • Noble metals [6]
- 29/68 • • • • • Iron group metals or copper [6]
- 29/69 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/70 • • • • of types characterised by their specific structure not provided for in groups B01J 29/08-B01J 29/65 [6]
- 29/72 • • • • containing iron group metals, noble metals or copper [6]
- 29/74 • • • • • Noble metals [6]
- 29/76 • • • • • Iron group metals or copper [6]
- 29/78 • • • • containing arsenic, antimony, bismuth, vanadium, niobium, tantalum, polonium, chromium, molybdenum, tungsten, manganese, technetium or rhenium [6]
- 29/80 • • • • Mixtures of different zeolites [6]
- 29/82 • • • • Phosphates [6]
- 29/83 • • • • Aluminophosphates (APO compounds) [6]
- 29/84 • • • • Aluminophosphates containing other elements, e.g. metals, boron [6]
- 29/85 • • • • Silicoaluminophosphates (SAPO compounds) [6]
- 29/86 • • • • Borosilicates; Aluminoborosilicates [6]
- 29/87 • • • • Gallosilicates; Aluminogallosilicates; Galloborosilicates [6]
- 29/88 • • • • Ferrosilicates; Ferroaluminosilicates [6]
- 29/89 • • • • Silicates, aluminosilicates or borosilicates of titanium, zirconium or hafnium [6]
- 29/90 • • • • Regeneration or reactivation [6]
- 31/00 Catalysts comprising hydrides, coordination complexes or organic compounds** (catalyst compositions used only in polymerisation reactions C08) [2]

### Note(s)

In this group, the presence of water is disregarded for classification purposes.

- 31/02 • • • • containing organic compounds or metal hydrides [2]
- 31/04 • • • • containing carboxylic acids or their salts [2]
- 31/06 • • • • containing polymers [2]
- 31/08 • • • • Ion-exchange resins [2]
- 31/10 • • • • • sulfonated [2]
- 31/12 • • • • containing organo-metallic compounds or metal hydrides [2]
- 31/14 • • • • of aluminium or boron [2]
- 31/16 • • • • containing coordination complexes [2]
- 31/18 • • • • containing nitrogen, phosphorus, arsenic or antimony [2]
- 31/20 • • • • Carbonyls [2]
- 31/22 • • • • Organic complexes [2]
- 31/24 • • • • Phosphines [2]
- 31/26 • • • • containing in addition, inorganic metal compounds not provided for in groups B01J 31/02-B01J 31/24 [2]
- 31/28 • • • • of the platinum group metals, iron group metals or copper [2]
- 31/30 • • • • Halides [2]
- 31/32 • • • • of manganese, technetium or rhenium [2]
- 31/34 • • • • of chromium, molybdenum or tungsten [2]
- 31/36 • • • • of vanadium, niobium or tantalum [2]
- 31/38 • • • • of titanium, zirconium or hafnium [2]
- 31/40 • • • • Regeneration or reactivation [2]

### Note(s)

1. When classifying in groups B01J 32/00-B01J 38/00, any part of a catalyst that is not identified by this classification, and which itself is determined to be novel and non-obvious, must also be classified in groups B01J 21/00-B01J 31/00. Such a part of a catalyst can be either a single substance or a composition in itself.
2. Any part of a catalyst which is not identified by the classification according to Note (1) above, and which is considered to represent information of interest for search, may also be classified. This can, for example, be the case when it is considered of interest to enable searching of catalysts using a combination of classification symbols. Such non-obligatory classification should be given as "additional information".

**32/00 Catalyst carriers in general [4]**

**33/00 Protection of catalysts, e.g. by coating [2]**

**35/00 Catalysts, in general, characterised by their form or physical properties [2]**

- 35/02 • • • • Solids [2]
- 35/04 • • • • Foraminous structures, sieves, grids, honeycombs [2]
- 35/06 • • • • Fabrics or filaments [2]
- 35/08 • • • • Spheres [2]
- 35/10 • • • • characterised by their surface properties or porosity [2]
- 35/12 • • • • Liquids or melts [2]

**37/00 Processes, in general, for preparing catalysts; Processes, in general, for activation of catalysts [4]**

- 37/02 • • • • Impregnation, coating or precipitation (protecting by coating B01J 33/00) [2]



- 37/025 • • using a distinct intermediate layer, e.g. substrate-support-active layer [6]
- 37/03 • • Precipitation; Co-precipitation [4]
- 37/04 • Mixing [2]
- 37/06 • Washing [2]
- 37/08 • Heat treatment [2]
- 37/10 • • in the presence of water, e.g. steam [2]
- 37/12 • Oxidising [2]
- 37/14 • • with gases containing free oxygen [2]
- 37/16 • Reducing [2]
- 37/18 • • with gases containing free hydrogen [2]
- 37/20 • Sulfiding [2]
- 37/22 • Halogenating [2]
- 37/24 • • Chlorinating [2]
- 37/26 • • Fluorinating [2]
- 37/28 • Phosphorising [2]
- 37/30 • Ion-exchange [2]
- 37/32 • Freeze drying, i.e. lyophilisation [2]
- 37/34 • Irradiation by, or application of, electric, magnetic or wave energy, e.g. ultrasonic waves [2]
- 37/36 • Biochemical methods [2]
- 38/00 Regeneration or reactivation of catalysts, in general [4]**
- 38/02 • Heat treatment [4]
- 38/04 • Gas or vapour treating; Treating by using liquids vaporisable upon contacting spent catalyst [4]
- 38/06 • • using steam [4]
- 38/08 • • using ammonia or derivatives thereof [4]
- 38/10 • • using elemental hydrogen [4]
- 38/12 • • Treating with free oxygen-containing gas [4]
- 38/14 • • • with control of oxygen content in oxidation gas [4]
- 38/16 • • • Oxidation gas comprising essentially steam and oxygen [4]
- 38/18 • • • with subsequent reactive gas treating [4]
- 38/20 • • • Plural distinct oxidation stages [4]
- 38/22 • • • Moving bed, e.g. vertically or horizontally moving bulk [4]
- 38/24 • • • • having mainly transverse, i.e. lateral, flow of oxygen-containing gas and material [4]
- 38/26 • • • • having mainly counter-current flow of oxygen-containing gas and material [4]
- 38/28 • • • • having mainly concurrent flow of oxygen-containing gas and material [4]
- 38/30 • • • in gaseous suspension, e.g. fluidised bed [4]
- 38/32 • • • Indirectly heating or cooling material within regeneration zone or prior to entry into regeneration zone [4]
- 38/34 • • • • with plural distinct serial combustion stages [4]
- 38/36 • • • • and with substantially complete oxidation of carbon monoxide to carbon dioxide within regeneration zone [4]
- 38/38 • • • and adding heat by solid heat carrier [4]
- 38/40 • • • and forming useful by-products [4]
- 38/42 • • using halogen-containing material [4]
- 38/44 • • • and adding simultaneously or subsequently free oxygen; using oxyhalogen compound [4]
- 38/46 • • • fluorine-containing [4]
- 38/48 • Liquid treating or treating in liquid phase, e.g. dissolved or suspended [4]
- 38/50 • • using organic liquids [4]
- 38/52 • • • oxygen-containing [4]
- 38/54 • • • halogen-containing [4]
- 38/56 • • • Hydrocarbons [4]
- 38/58 • • • and gas addition thereto [4]
- 38/60 • • using acids [4]
- 38/62 • • • organic [4]
- 38/64 • • using alkaline material; using salts [4]
- 38/66 • • • using ammonia or derivatives thereof [4]
- 38/68 • • including substantial dissolution or chemical precipitation of a catalyst component in the ultimate reconstitution of the catalyst [4]
- 38/70 • • Wet oxidation of material submerged in liquid [4]
- 38/72 • including segregation of diverse particles [4]
- 38/74 • utilising ion-exchange [4]
- Ion-exchange [3]**
- Note(s)**
1. In groups B01J 39/00-B01J 49/00:
    - ion-exchange covers all processes whereby ions are exchanged between the solid exchanger and the liquid to be treated and wherein the exchanger is not soluble in the liquid to be treated;
    - ion-exchange processes cover also ion-exchange in combination with complex or chelate forming reactions.
  2. In groups B01J 39/00-B01J 49/00, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- 39/00 Cation exchange; Use of material as cation exchangers; Treatment of material for improving the cation exchange properties** (ion-exchange chromatography processes B01D 15/36) [3, 2006.01]
- 39/02 • Processes using inorganic exchangers [3]
- 39/04 • Processes using organic exchangers [3]
- 39/08 • Use of material as cation exchangers; Treatment of material for improving the cation exchange properties [3]
- 39/10 • • Oxides or hydroxides [3]
- 39/12 • • Compounds containing phosphorus [3]
- 39/14 • • Base exchange silicates, e.g. zeolites [3]
- 39/16 • • Organic material [3]
- 39/18 • • • Macromolecular compounds [3]
- 39/20 • • • • Macromolecular compounds obtained by reactions only involving unsaturated carbon-to-carbon bonds [3]
- 39/22 • • • • Cellulose or wood; Derivatives thereof [3]
- 39/24 • • Carbon, coal or tar [3]
- 39/26 • Cation exchangers for chromatographic processes [2006.01]
- 41/00 Anion exchange; Use of material as anion exchangers; Treatment of material for improving the anion exchange properties** (ion-exchange chromatography processes B01D 15/36) [3, 2006.01]
- 41/02 • Processes using inorganic exchangers [3]
- 41/04 • Processes using organic exchangers [3]
- 41/08 • Use of material as anion exchangers; Treatment of material for improving the anion exchange properties [3]
- 41/10 • • Inorganic material (carbon, coal or tar B01J 41/18) [3]
- 41/12 • • Macromolecular compounds [3]
- 41/14 • • • Macromolecular compounds obtained by reactions only involving unsaturated carbon-to-carbon bonds [3]

## B01J

- 41/16 • • • Cellulose or wood; Derivatives thereof [3]
- 41/18 • • Carbon, coal or tar [3]
- 41/20 • Anion exchangers for chromatographic processes [2006.01]
- 43/00 **Amphoteric ion-exchange, i.e. using ion-exchangers having cationic and anionic groups; Use of material as amphoteric ion-exchangers; Treatment of material for improving their amphoteric ion-exchange properties** (ion-exchange chromatography processes B01D 15/36) [3, 2006.01]
- 45/00 **Ion-exchange in which a complex or a chelate is formed; Use of material as complex or chelate forming ion-exchangers; Treatment of material for improving the complex or chelate forming ion-exchange properties** (ion-exchange chromatography processes B01D 15/36) [3, 2006.01]
- 47/00 **Ion-exchange processes in general; Apparatus therefor** (ion-exchange chromatography processes or apparatus B01D 15/08) [3, 2006.01]
- 47/02 • Column or bed processes [3]
- 47/04 • • Mixed-bed processes [3]
- 47/06 • • during which the ion-exchange material is subjected to a physical treatment, e.g. heat, electric current, irradiation, vibration (electrodialysis, electro-osmosis B01D 61/42) [3]
- 47/08 • • • subjected to a direct electric current [3]
- 47/10 • with moving ion-exchange material; with ion-exchange material in suspension or in fluidised-bed form [3]
- 47/12 • characterised by the use of ion-exchange material in the form of sheets, ribbons or filaments, e.g. membranes (electrodialysis, electro-osmosis B01D 61/42) [3]
- 47/14 • Controlling or regulating [3]
- 49/00 **Regeneration or reactivation of ion-exchangers; Apparatus therefor** (ion-exchange chromatography processes or apparatus B01D 15/08) [3, 2006.01]
- 49/02 • having devices which prevent back-flow of the ion-exchange mass during regenerating [3]

## B01L

**CHEMICAL OR PHYSICAL LABORATORY APPARATUS FOR GENERAL USE** (apparatus for medical or pharmaceutical purposes A61; apparatus for industrial purposes or laboratory apparatus whose construction and performance are comparable to that of similar industrial apparatus, see the relevant classes for industrial apparatus, particularly subclasses of B01 and C12; separating or distilling apparatus B01D; mixing or stirring devices B01F; atomisers B05B; sieves B07B; corks, bungs B65D; handling liquids in general B67; vacuum pumps F04; siphons F04F 10/00; taps, stop-cocks F16K; tubes, tube joints F16L; apparatus specially adapted for investigating or analysing materials G01, particularly G01N; electrical or optical apparatus, see the relevant classes in sections G and H)

### Note(s)

This subclass covers only laboratory apparatus which is either applicable solely to laboratory purposes or which, by reason of its simple construction and adaptability, is such as would not be suitable for industrial use.

- 1/00 **Enclosures; Chambers** (fume cupboards B08B; provided with manipulation devices, glove boxes B25J; cooling chambers F25D)
- 1/02 • Air-pressure chambers; Air-locks therefor
- 1/04 • Dust-free rooms or enclosures
- 3/00 **Containers or dishes for laboratory use, e.g. laboratory glassware** (bottles B65D; apparatus for enzymology or microbiology C12M 1/00); **Droppers** (receptacles for volumetric purposes G01F)
- 3/02 • Burettes; Pipettes
- 3/04 • Crucibles
- 3/06 • Crystallising dishes
- 3/08 • Flasks (specially adapted for distillation B01D)
- 3/10 • Wash bottles
- 3/12 • Gas jars or cylinders
- 3/14 • Test tubes
- 3/16 • Retorts
- 3/18 • Spatulas
- 5/00 **Gas handling apparatus** (gas jars or cylinders B01L 3/12; cold traps, cold baffles B01D 8/00; separation of gases or vapours B01D 53/00; gas generators B01J 7/00; steam traps F16T)
- 5/02 • Gas collection apparatus, e.g. by bubbling under water (for sampling G01N)
- 5/04 • Gas washing apparatus, e.g. by bubbling
- 7/00 **Heating or cooling apparatus** (evaporators B01D 1/00; drying gases or vapours, e.g. desiccators, B01D 53/26; autoclaves B01J 3/04; drying ovens F26B; furnaces, ovens F27); **Heat insulating devices** [3]
- 7/02 • Water baths; Sand baths; Air baths
- 7/04 • Heat insulating devices, e.g. jackets for flasks [2010.01]
- 9/00 **Supporting devices; Holding devices** (tweezers, tongs B25B)
- 9/02 • Laboratory benches or tables; Fittings therefor
- 9/04 • Retort stands; Retort clamps
- 9/06 • Test-tube stands; Test-tube holders
- 99/00 **Subject matter not provided for in other groups of this subclass** [2010.01]

## B02 CRUSHING, PULVERISING, OR DISINTEGRATING; PREPARATORY TREATMENT OF GRAIN FOR MILLING

### B02B PREPARING GRAIN FOR MILLING; REFINING GRANULAR FRUIT TO COMMERCIAL PRODUCTS BY WORKING THE SURFACE (making dough from cereals directly A21C; preservation or sterilisation of cereals A23B; cleaning fruit A23N; preparation of malt C12C)

- |      |   |      |   |
|------|---|------|---|
| 1/00 | <b>Preparing grain for milling or like processes</b> (hulling, husking, decorticating, polishing, removing the awns, or degerming B02B 3/00)                              | 3/02 | • by means of discs                               |
| 1/02 | • Dry treatment (sifting or sorting in general B07)   | 3/04 | • by means of rollers                             |
| 1/04 | • Wet treatment, e.g. washing, wetting, softening   | 3/06 | • by means of screws or worms                     |
| 1/06 | • • Devices with rotary parts   | 3/08 | • by means of beaters or blades                   |
| 1/08 | • Conditioning grain with respect to temperature or water content (air conditioning or ventilating of silos F24F; drying apparatus F26B; hygrometers G01N)                | 3/10 | • by means of brushes                             |
|      |   | 3/12 | • by means of fluid                               |
|      |   | 3/14 | • Producing flour or meal directly                |
| 3/00 | <b>Hulling; Husking; Decorticating</b> (decorticating textile fibres D01B 1/14); <b>Polishing; Removing the awns</b> (in threshing machines A01F 12/42); <b>Degerming</b> | 5/00 | <b>Grain treatment not otherwise provided for</b> |
|      |   | 5/02 | • Combined processes                              |
|      |   | 7/00 | <b>Auxiliary devices</b>                          |
|      |   | 7/02 | • Feeding or discharging devices                  |

### B02C CRUSHING, PULVERISING, OR DISINTEGRATING IN GENERAL; MILLING GRAIN (obtaining metallic powder by crushing, grinding or milling B22F 9/04)

#### Subclass index

#### DISINTEGRATING IN GENERAL

- Using reciprocating or rotary crushers.....1/00, 2/00
- Using rollers.....4/00
- Using discs.....7/00
- Using rotary beaters.....13/00
- By tumbling.....17/00
- Otherwise.....15/00, 18/00, 19/00
- Auxiliary methods, accessories.....23/00

#### DISINTEGRATING PLANT; CONTROL ARRANGEMENTS.....21/00, 25/00

#### MILLING METHODS OR MILLS SPECIALLY ADAPTED FOR GRAIN; ACCESSORIES THEREFOR.....4/06, 4/16, 4/24, 4/38, 7/13, 7/18, 9/00, 11/00

- |      |  |      |   |
|------|--|------|---|
| 1/00 | <b>Crushing or disintegrating by reciprocating members</b>   | 4/02 | • with two or more rollers  |
| 1/02 | • Jaw crushers or pulverisers  | 4/04 | • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids    |
| 1/04 | • • with single-acting jaws  | 4/06 | • • specially adapted for milling grain   |
| 1/06 | • • with double-acting jaws  | 4/08 | • • with co-operating corrugated or toothed crushing-rollers                              |
| 1/08 | • • with jaws coacting with a rotating roller  | 4/10 | • with a roller co-operating with a stationary member                                     |
| 1/10 | • • Shape or construction of jaws  | 4/12 | • • in the form of a plate  |
| 1/12 | • Mills with non-rotating spiked members   | 4/14 | • • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids  |
| 1/14 | • Stamping mills   |      |   |
| 2/00 | <b>Crushing or disintegrating by gyratory or cone crushers</b>   | 4/16 | • • • specially adapted for milling grain   |
| 2/02 | • eccentrically moved  | 4/18 | • • in the form of a bar  |
| 2/04 | • • with vertical axis   | 4/20 | • • • wherein the roller is corrugated or toothed   |
| 2/06 | • • • and with top bearing   | 4/22 | • • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids  |
| 2/08 | • • with horizontal axis   | 4/24 | • • • specially adapted for milling grain   |
| 2/10 | • concentrically moved; Bell crushers  | 4/26 | • • in the form of a grid or grating  |
|      |  | 4/28 | • Details   |
| 4/00 | <b>Crushing or disintegrating by roller mills</b> (with milling members in the form of rollers or balls co-operating with rings or discs B02C 15/00; roller mills or roll refiners exclusively for chocolate A23G 1/10, A23G 1/12) | 4/30 | • • Shape or construction of rollers  |
|      |  | 4/32 | • • Adjusting, applying pressure to, or controlling the distance between, milling members |
|      |  | 4/34 | • • • in mills wherein a roller co-operates with a stationary member                      |

- 4/36 • • • in mills specially adapted for paste-like materials
- 4/38 • • • in grain mills
- 4/40 • • Detachers, e.g. scrapers
- 4/42 • • Driving mechanisms; Roller speed control
- 4/44 • • Cooling or heating rollers or bars
- 7/00 Crushing or disintegrating by disc mills** (apparatus specially adapted for manufacture or treatment of cocoa or cocoa products exclusively A23G 1/04)
  - 7/02 • with coaxial discs
  - 7/04 • • with concentric circles of intermeshing teeth
  - 7/06 • • with horizontal axis (B02C 7/04 takes precedence)
  - 7/08 • • with vertical axis (B02C 7/04 takes precedence)
  - 7/10 • with eccentric discs
  - 7/11 • Details
  - 7/12 • • Shape or construction of discs
  - 7/13 • • • for grain mills
  - 7/14 • • Adjusting, applying pressure to, or controlling distance between, discs
  - 7/16 • • Driving mechanisms
  - 7/17 • • Cooling or heating of discs
  - 7/175 • Disc mills specially adapted for paste-like material, e.g. paint, chocolate, colloids
  - 7/18 • Disc mills specially adapted for grain
- 9/00 Other milling methods or mills specially adapted for grain**
  - 9/02 • Cutting or splitting grain
  - 9/04 • Systems or sequences of operations; Plant
- 11/00 Other auxiliary devices or accessories specially adapted for grain mills**
  - 11/02 • Breaking up amassed particles, e.g. flakes
  - 11/04 • Feeding devices
  - 11/06 • Arrangements for preventing fire or explosion (methods for preventing or extinguishing fires, devices therefor A62C)
  - 11/08 • Cooling, heating, ventilating, conditioning with respect to temperature or water content (conditioning grain before milling B02B 1/08; air-conditioning or ventilating in general F24F)
- 13/00 Disintegrating by mills having rotary beater elements**
  - 13/02 • with horizontal rotor shaft (with axial flow B02C 13/10)
  - 13/04 • • with beaters hinged to the rotor; Hammer mills
  - 13/06 • • with beaters rigidly connected to the rotor
  - 13/08 • • • and acting as a fan
  - 13/09 • • • and throwing the material against an anvil or impact plate
  - 13/10 • with horizontal rotor shaft and axial flow
  - 13/12 • • with vortex chamber
  - 13/13 • with horizontal rotor shaft and combined with sifting devices, e.g. for making powdered fuel
  - 13/14 • with vertical rotor shaft, e.g. combined with sifting devices
  - 13/16 • • with beaters hinged to the rotor
  - 13/18 • • with beaters rigidly connected to the rotor
  - 13/20 • with two or more co-operating rotors
  - 13/22 • with intermeshing pins
  - 13/24 • • arranged around a vertical axis
  - 13/26 • Details
  - 13/28 • • Shape or construction of beater elements
  - 13/282 • • Shape or inner surface of mill-housings
  - 13/284 • • • Built-in screens
- 13/286 • • Feeding or discharge
- 13/288 • • Ventilating, or influencing air circulation
- 13/30 • • Driving mechanisms
- 13/31 • • Safety devices or measures
- 15/00 Disintegrating by milling members in the form of rollers or balls co-operating with rings or discs**
  - 15/02 • Centrifugal pendulum-type mills
  - 15/04 • Mills with pressed pendularly-mounted rollers, e.g. spring pressed [4]
  - 15/06 • Mills with rollers forced against the interior of a rotary ring, e.g. under spring action (B02C 15/04 takes precedence) [4]
  - 15/08 • Mills with balls or rollers centrifugally forced against the inner surface of a ring, the balls or rollers of which are driven by a centrally arranged member (B02C 15/02 takes precedence)
  - 15/10 • Mills with balls or rollers centrifugally forced against the inner surface of a ring, the balls or rollers of which are driven by other means than a centrally-arranged member
  - 15/12 • Mills with at least two discs and interposed balls or rollers mounted like ball or roller bearings [4]
  - 15/14 • Edge runners, e.g. Chile mills
  - 15/16 • with milling members essentially having different peripheral speeds and in the form of a hollow cylinder or cone and an internal roller or cone
- 17/00 Disintegrating by tumbling mills, i.e. mills having a container charged with the material to be disintegrated with or without special disintegrating members such as pebbles or balls** (high-speed drum mills B02C 19/11)
  - 17/02 • with perforated container
  - 17/04 • with unperforated container
  - 17/06 • • with several compartments
  - 17/07 • • • in radial arrangement
  - 17/08 • • with containers performing a planetary movement
  - 17/10 • with one or a few disintegrating members arranged in the container
  - 17/14 • Mills in which the charge to be ground is turned over by movements of the container other than by rotating, e.g. by swinging, vibrating, tilting
  - 17/16 • Mills in which a fixed container houses stirring means tumbling the charge
  - 17/18 • Details
  - 17/20 • • Disintegrating members
  - 17/22 • • Lining for containers
  - 17/24 • • Driving mechanisms
- 18/00 Disintegrating by knives or other cutting or tearing members which chop material into fragments** (slicing B26D); **Mincing machines or similar apparatus using worms or the like** (machines for domestic use not covered otherwise A47J 43/04; multi-purpose machines for preparing food A47J 44/00)
  - 18/02 • with reciprocating knives
  - 18/04 • • Details
  - 18/06 • with rotating knives
  - 18/08 • • within vertical containers
  - 18/10 • • • with drive arranged above container
  - 18/12 • • • with drive arranged below container
  - 18/14 • • within horizontal containers
  - 18/16 • • Details
  - 18/18 • • • Knives; Mountings thereof
  - 18/20 • • • Sickle-shaped knives
  - 18/22 • • • Feed or discharge means

- 18/24 • • • Drives
- 18/26 • with knives which both reciprocate and rotate
- 18/28 • with spiked cylinders
- 18/30 • Mincing machines with perforated discs and feeding worms
- 18/32 • • with sharpening devices
- 18/34 • • with means for cleaning the perforated discs
- 18/36 • • Knives or perforated discs
- 18/38 • • Drives
- 19/00 Other disintegrating devices or methods** (for grain B02C 9/00)
- 19/06 • Jet mills
- 19/08 • Pestle and mortar
- 19/10 • Mills in which a friction block is towed along the surface of a cylindrical or annular member
- 19/11 • High-speed drum mills (for separating B04B)
- 19/16 • Mills provided with vibrators (tumbling mills B02C 17/14)
- 19/18 • Use of auxiliary physical effects, e.g. ultrasonics, irradiation, for disintegrating
- 19/20 • Disintegrating by grating
- 19/22 • Crushing mills with screw-shaped crushing means
- 21/00 Disintegrating plant with or without drying of the material** (for grain B02C 9/04)
- 21/02 • Transportable disintegrating plant
- 23/00 Auxiliary methods or auxiliary devices or accessories specially adapted for crushing or disintegrating not provided for in groups B02C 1/00-B02C 21/00 or not specially adapted to apparatus covered by one only of groups B02C 1/00-B02C 21/00** (separating or sorting in general B03, B04, B07)
- 23/02 • Feeding devices (transport devices in general B65G)
- 23/04 • Safety devices (in general F16P)
- 23/06 • Selection or use of additives to aid disintegrating
- 23/08 • Separating or sorting of material, associated with crushing or disintegrating (B02C 23/18 takes precedence) [2]
- 23/10 • • with separator arranged in discharge path of crushing or disintegrating zone [2]
- 23/12 • • • with return of oversize material to crushing or disintegrating zone [2]
- 23/14 • • with more than one separator [2]
- 23/16 • • with separator defining termination of crushing or disintegrating zone, e.g. screen denying egress of oversize material [2]
- 23/18 • Adding fluid, other than for crushing or disintegrating by fluid energy (feeding devices B02C 23/02) [2]
- 23/20 • • after crushing or disintegrating [2]
- 23/22 • • • with recirculation of material to crushing or disintegrating zone [2]
- 23/24 • • Passing gas through crushing or disintegrating zone (B02C 23/38, B02C 23/40 take precedence) [2]
- 23/26 • • • characterised by point of gas entry or exit or by gas flow path [2]
- 23/28 • • • gas moving means being integral with, or attached to, crushing or disintegrating element [2]
- 23/30 • • • the applied gas acting to effect material separation (B02C 23/34 takes precedence) [2]
- 23/32 • • • with return of oversize material to crushing or disintegrating zone (B02C 23/34 takes precedence) [2]
- 23/34 • • • gas being recirculated to crushing or disintegrating zone [2]
- 23/36 • • the crushing or disintegrating zone being submerged in liquid [2]
- 23/38 • • in apparatus having multiple crushing or disintegrating zones [2]
- 23/40 • • with more than one means for adding fluid to the material being crushed or disintegrated [2]
- 25/00 Control arrangements specially adapted for crushing or disintegrating**

## **B03 SEPARATION OF SOLID MATERIALS USING LIQUIDS OR USING PNEUMATIC TABLES OR JIGS; MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS**

**B03B SEPARATING SOLID MATERIALS USING LIQUIDS OR USING PNEUMATIC TABLES OR JIGS** (removing fluids from solids B01D; magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high voltage electric fields B03C; flotation, differential sedimentation B03D; separating by dry methods B07; screening or sifting B07B; by picking B07C; separating peculiar to particular materials and provided for in other single classes, see the relevant classes)

### Subclass index

PRETREATMENT.....	1/00
WASHING, WET SEPARATING, SEPARATING BY PNEUMATIC JIGS; FEEDING AND DISCHARGING PRODUCTS TREATED THEREBY.....	4/00, 5/00, 11/00
COMBINATIONS OF PROCESSES OR APPARATUS.....	7/00
ARRANGEMENTS OF PLANT.....	9/00
CONTROL BY PHYSICAL EFFECTS.....	13/00

**1/00 Conditioning for facilitating separation by altering physical properties of the matter to be treated** (pretreatment of ores in general C22B)

- 1/02 • Preparatory heating
- 1/04 • by additives
- 1/06 • by varying ambient atmospheric pressure

## B03B

- 4/00 Separating by pneumatic tables or by pneumatic jigs** (sink-float separation using dry heavy media B03B 5/46) [2]
- 4/02 • using swinging or shaking tables [6]
- 4/04 • using rotary tables or tables formed by travelling belts (separating solids from solids using gas currents and revolving drums B07B 4/06) [6]
- 4/06 • using fixed and inclined tables [6]
- 5/00 Washing granular, powdered or lumpy materials; Wet separating** (separating by pneumatic tables or by pneumatic jigs B03B 4/00) [2]
- 5/02 • using shaken, pulsated or stirred beds as the principal means of separation (B03B 5/28, B03B 5/48 take precedence) [2]
- 5/04 • • on shaking tables (on vanners B03B 5/08) [2]
- 5/06 • • • Constructional details of shaking tables, e.g. riffing [2]
- 5/08 • • on vanners [2]
- 5/10 • • on jigs [2]
- 5/12 • • • using pulses generated mechanically in fluid [2]
- 5/14 • • • • Plunger jigs [2]
- 5/16 • • • • Diaphragm jigs [2]
- 5/18 • • • • Moving-sieve jigs [2]
- 5/20 • • • using pulses generated by air injection [2]
- 5/22 • • • using pulses generated by liquid injection [2]
- 5/24 • • • Constructional details of jigs, e.g. pulse control devices [2]
- 5/26 • • in sluices [2]
- 5/28 • by sink-float separation [2]
- 5/30 • • using heavy liquids or suspensions [2]
- 5/32 • • • using centrifugal force (centrifuges B04B; cyclones B04C) [2]
- 5/34 • • • • Applications of hydrocyclones [2]
- 5/36 • • • Devices therefor, other than using centrifugal force (jigs B03B 5/10) [2]
- 5/38 • • • • of conical receptacle type [2]
- 5/40 • • • • of trough type [2]
- 5/42 • • • • of drum or lifting wheel type [2]
- 5/44 • • • Application of particular media therefor [2]
- 5/46 • • using dry heavy media; Devices therefor [2]
- 5/48 • by mechanical classifiers (sink-float separation aspects B03B 5/28) [2]
- 5/50 • • Rake classifiers [2]
- 5/52 • • Spiral classifiers [2]
- 5/54 • • Drag classifiers [2]
- 5/56 • • Drum classifiers [2]
- 5/58 • • Bowl classifiers [2]
- 5/60 • by non-mechanical classifiers, e.g. slime tanks (using shaken, pulsated or stirred beds as the principal means of separation B03B 5/02; hydraulic classifiers B03B 5/62; water impulse classifiers B03B 5/68) [2]
- 5/62 • by hydraulic classifiers, e.g. of launder, tank, spiral or helical chute concentrator type [2]
- 5/64 • • of the free settling type [2]
- 5/66 • • of the hindered settling type [2]
- 5/68 • by water impulse (shaking tables B03B 5/04; jigs B03B 5/10; hydraulic classifiers B03B 5/62) [2]
- 5/70 • • on tables or strakes [2]
- 5/72 • • • which are movable [2]
- 5/74 • • • • Revolving tables [2]
- 7/00 Combinations of wet processes or apparatus with other processes or apparatus, e.g. for dressing ores or garbage**
- 9/00 General arrangement of separating plant, e.g. flow sheets**
- 9/02 • specially adapted for oil-sand, oil-chalk, oil-shales, ozokerite, bitumen, or the like
- 9/04 • specially adapted for furnace residues, smeltings, or foundry slags
- 9/06 • specially adapted for refuse
- 11/00 Feed or discharge devices integral with washing or wet-separating equipment** (filling or emptying devices per se B65G 65/30)
- 13/00 Control arrangements specially adapted for wet-separating apparatus or for dressing plant, using physical effects** (detecting, measuring, or analysing devices G01)
- 13/02 • using optical effects
- 13/04 • using electrical or electromagnetic effects
- 13/06 • using absorption or reflection of radioactive emanation

## B03C MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS (filters making use of electricity or magnetism B01D 35/06; separating isotopes B01D 59/00; combinations of magnetic or electrostatic separation with separation of solids by other means B03B, B07B; separating sheets from piles B65H 3/00; magnets or magnet coils per se H01F) [5]

- 1/00 Magnetic separation**
- 1/005 • Pretreatment specially adapted for magnetic separation [6]
- 1/01 • • by addition of magnetic adjuvants [6]
- 1/015 • • by chemical treatment imparting magnetic properties to the material to be separated, e.g. roasting, reduction, oxidation [6]
- 1/02 • acting directly on the substance being separated [5]
- 1/021 • • Separation using Meissner effect, i.e. deflection of superconductive particles in a magnetic field [6]
- 1/023 • • Separation using Lorentz force, i.e. deflection of electrically charged particles in a magnetic field [6]
- 1/025 • • High gradient magnetic separators [5]
- 1/027 • • • with reciprocating canisters [6]
- 1/029 • • • with circulating matrix or matrix elements (matrix elements B03C 1/034) [6]
- 1/03 • • • rotating, e.g. of the carousel type [5, 6]
- 1/031 • • • Component parts; Auxiliary operations [6]
- 1/032 • • • • Matrix cleaning systems [6]
- 1/033 • • • • characterised by the magnetic circuit [6]
- 1/034 • • • • • characterised by the matrix elements [6]
- 1/035 • • Open gradient magnetic separators, i.e. separators in which the gap is unobstructed, characterised by the configuration of the gap [5]
- 1/0355 • • • using superconductive coils [6]
- 1/04 • • with the material carriers in the form of trays or with tables
- 1/06 • • • with magnets moving during operation
- 1/08 • • • with non-movable magnets

- 1/10 • • with cylindrical material carriers (B03C 1/247 takes precedence) [6]
- 1/12 • • • with magnets moving during operation; with movable pole pieces
- 1/14 • • • with non-movable magnets
- 1/16 • • with material carriers in the form of belts
- 1/18 • • • with magnets moving during operation
- 1/20 • • • • in the form of belts, e.g. cross-belt type
- 1/22 • • • with non-movable magnets
- 1/23 • • with material carried by oscillating fields; with material carried by travelling fields, e.g. generated by stationary magnetic coils; Eddy-current separators, e.g. sliding ramp [5]
- 1/24 • • • with material carried by travelling fields [5]
- 1/247 • • • obtained by a rotating magnetic drum [6]
- 1/253 • • • • obtained by a linear motor [6]
- 1/26 • • with free falling material (B03C 1/035 takes precedence) [5]
- 1/28 • • Magnetic plugs and dipsticks
- 1/30 • • Combinations with other devices, not otherwise provided for
- 1/32 • acting on the medium containing the substance being separated, e.g. magneto-gravimetric-, magnetohydrostatic-, or magnetohydrodynamic separation [5]
- 3/00 Separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect** (exhaust or silencing apparatus for machines or engines having means for removing solid constituents of exhaust, using electric or electrostatic separators F01N 3/01)
- 3/01 • Pretreatment of the gases prior to electrostatic precipitation
- 3/011 • • Prefiltering; Flow controlling [6]
- 3/013 • • Conditioning by chemical additives, e.g. with SO<sub>3</sub> [6]
- 3/014 • • Addition of water; Heat exchange, e.g. by condensation [6]
- 3/016 • • by acoustic or electromagnetic energy, e.g. ultra-violet light [6]
- 3/017 • Combinations of electrostatic separation with other processes, not otherwise provided for [6]
- 3/019 • Post-treatment of gases [6]
- 3/02 • Plant or installations having external electricity supply (electrode constructions B03C 3/40)
- 3/04 • • dry type
- 3/06 • • • characterised by presence of stationary tube electrodes
- 3/08 • • • characterised by presence of stationary flat electrodes arranged with their flat surfaces parallel to the gas stream
- 3/09 • • • characterised by presence of stationary flat electrodes arranged with their flat surfaces at right angles to the gas stream
- 3/10 • • • characterised by presence of electrodes moving during separating action
- 3/12 • • • characterised by separation of ionising and collecting stations
- 3/14 • • • characterised by the additional use of mechanical effects, e.g. gravity (B03C 3/32 takes precedence)
- 3/145 • • • • Inertia [6]
- 3/15 • • • • Centrifugal forces [6]
- 3/155 • • • • Filtration [6]
- 3/16 • • wet type
- 3/28 • Plant or installations without electricity supply, e.g. using electrets
- 3/30 • • in which electrostatic charge is generated by passage of the gases, i.e. tribo-electricity
- 3/32 • Transportable units, e.g. for cleaning room air (room air-conditioners having an electrostatic separating stage F24F)
- 3/34 • Constructional details or accessories or operation thereof
- 3/36 • • Controlling flow of gases or vapour
- 3/38 • • Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, flames (electrode constructions B03C 3/40; ionising gases H05H)
- 3/40 • • Electrode constructions
- 3/41 • • • Ionising-electrodes
- 3/43 • • • • radioactive
- 3/45 • • • Collecting-electrodes
- 3/47 • • • • flat, e.g. plates, discs, gratings
- 3/49 • • • • tubular
- 3/51 • • • • Catch-space electrodes, e.g. slotted-box form
- 3/53 • • • • Liquid, or liquid-film, electrodes
- 3/60 • • • Use of special materials other than liquids
- 3/62 • • • • ceramics
- 3/64 • • • • synthetic resins
- 3/66 • • Applications of electricity supply techniques
- 3/68 • • • Control systems therefor
- 3/70 • • • insulating in electric separators (B03C 3/53 takes precedence)
- 3/72 • • Emergency control systems
- 3/74 • • Cleaning the electrodes
- 3/76 • • • by using a mechanical vibrator, e.g. rapping gear
- 3/78 • • • by washing
- 3/80 • • • by gas or solid particle blasting
- 3/82 • • Housings
- 3/84 • • • Protective coatings
- 3/86 • • Electrode-carrying means (B03C 3/40 takes precedence)
- 3/88 • • Cleaning-out collected particles
- 5/00 Separating dispersed particles from liquids by electrostatic effect** (combined with centrifuges B04B 5/10) [2]
- 5/02 • Separators
- 7/00 Separating solids from solids by electrostatic effect**
- 7/02 • Separators
- 7/04 • • with material carriers in the form of trays, troughs, or tables
- 7/06 • • with cylindrical material carriers
- 7/08 • • with material carriers in the form of belts
- 7/10 • • with material falling in cascades
- 7/12 • • with material falling free
- 9/00 Electrostatic separation not provided for in any single one of the other main groups of this subclass**
- 11/00 Separation by high-voltage electrical fields, not provided for in other groups of this subclass [2006.01]**

## B03C

### B03D FLOTATION; DIFFERENTIAL SEDIMENTATION (in combination with other separation of solids B03B; sink-float separation B03B 5/28)

#### 1/00 Flotation

- 1/001 • Flotation agents [5]

##### Note(s)

1. In this group in the absence of an indication to the contrary, classification is made in the last appropriate place.
2. In this group, it is desirable to add the appropriate indexing code(s) from each of groups B03D 101/00 or B03D 103/00.

- 1/002 • • Inorganic compounds [5]
- 1/004 • • Organic compounds [5]
- 1/006 • • • Hydrocarbons [5]
- 1/008 • • • containing oxygen [5]
- 1/01 • • • containing nitrogen [5]
- 1/012 • • • containing sulfur [5]
- 1/014 • • • containing phosphorus [5]
- 1/016 • • • Macromolecular compounds [5]
- 1/018 • • Mixtures of inorganic and organic compounds [5]
- 1/02 • Froth-flotation processes
- 1/04 • • by varying ambient atmospheric pressure
- 1/06 • • differential
- 1/08 • Subsequent treatment of concentrated product
- 1/10 • • Removing adhering liquid from separated materials
- 1/12 • Agent recovery
- 1/14 • Flotation machines (devices for feeding measured quantities of reagents B01J 4/02)

- 1/16 • • with impellers; Subaeration machines
- 1/18 • • • without air supply
- 1/20 • • • with internal air pumps
- 1/22 • • • with external blowers
- 1/24 • • pneumatic
- 1/26 • • • Air lift machines

#### 3/00 Differential sedimentation

- 3/02 • Coagulation
- 3/04 • • assisted by vibrations
- 3/06 • Flocculation

#### Indexing scheme associated with group B03D 1/001, relating to the effects produced and the materials treated. [5]

##### 101/00 Specified effects produced by the flotation agents [5]

- 101/02 • Collectors [5]
- 101/04 • Frothers [5]
- 101/06 • Depressants [5]

##### 103/00 Specified materials treated by the flotation agents [5]

- 103/02 • Ores [5]
- 103/04 • • Non-sulfide ores [5]
- 103/06 • • • Phosphate ores [5]
- 103/08 • • • Coal ores [5]
- 103/10 • • • Potassium ores [5]

## B04 CENTRIFUGAL APPARATUS OR MACHINES FOR CARRYING-OUT PHYSICAL OR CHEMICAL PROCESSES

### Note(s)

Attention is drawn to the Notes following the subsection title "SEPARATING; MIXING".

### B04B CENTRIFUGES (high-speed drum mills B02C 19/11; domestic spin driers D06F; analysing, measuring or monitoring physical or chemical properties of samples during centrifuging, see the relevant subclasses for these procedures, e.g. G01N)

### Note(s)

This subclass covers machines or apparatus for separating, mixing, drying, extracting, purifying, or like treating in which centrifugal effects are generated by rotary bowls or other rotors. Where such machines or apparatus involve pumping effects, such effects must be incidental or subsidiary to the treating.

#### Types of centrifuges; Centrifuges characterised by discharging means

##### 1/00 Centrifuges with rotary bowls provided with solid jackets for separating predominantly liquid mixtures with or without solid particles

- 1/02 • without inserted separating walls
- 1/04 • with inserted separating walls
- 1/06 • • of cylindrical shape
- 1/08 • • of conical shape
- 1/10 • with discharging outlets in the plane of the maximum diameter of the bowl

- 1/12 • • with continuous discharge
- 1/14 • • with periodical discharge
- 1/16 • • • with discharging outlets controlled by the rotational speed of the bowl
- 1/18 • • • controlled by the centrifugal force of an auxiliary liquid
- 1/20 • discharging solid particles from the bowl by a conveying screw coaxial with the bowl axis and rotating relatively to the bowl



- 3/00 Centrifuges with rotary bowls in which solid particles or bodies become separated by centrifugal force and simultaneously sifting or filtering**
- 3/02 • discharging solid particles from the bowl by means co-axial with the bowl axis and moving to and fro, i.e. push-type centrifuges
- 3/04 • discharging solid particles from the bowl by a conveying screw co-axial with the bowl axis and rotating relatively to the bowl
- 3/06 • discharging solid particles by vibrating the bowl
- 3/08 • discharging solid particles by bowl walls in the form of endless bands
- 5/00 Other centrifuges**
- 5/02 • Centrifuges consisting of a plurality of separate bowls rotating round an axis situated between the bowls
- 5/04 • Radial chamber apparatus for separating predominantly liquid mixtures, e.g. butyrometers
- 5/06 • Centrifugal counter-current apparatus
- 5/08 • Centrifuges for separating predominantly gaseous mixtures
- 5/10 • Centrifuges combined with other apparatus, e.g. electrostatic separators; Sets or systems of several centrifuges (B04B 5/12 takes precedence; magnetic or electrostatic separators B03C) [2]
- 5/12 • Centrifuges in which rotors other than bowls generate centrifugal effects in stationary containers

#### **Elements: Accessories**

- 7/00 Elements of centrifuges** (drives B04B 9/00; feeding, charging, or discharging accessories or devices B04B 11/00)
- 7/02 • Casings; Lids (shock absorbers, vibration dampers F16F)
- 7/04 • • Casings facilitating discharge
- 7/06 • • Safety devices
- 7/08 • Rotary bowls (centrifugal casting machines B22D)
- 7/10 • • Bowls for shaping solids
- 7/12 • • Inserts, e.g. armouring plates

**B04C APPARATUS USING FREE VORTEX FLOW, e.g. CYCLONES** (exhaust or silencing apparatus for machines or engines having means for removing solid constituents of exhaust, using inertial or centrifugal separators F01N 3/037; cyclonic type combustion apparatus F23)

#### **Note(s)**

This subclass covers apparatus for separating, mixing or like treating in which centrifugal effects are generated by free vortex flow, otherwise than by rotary bowls, rotors or curved passages.

- 1/00 Apparatus in which the main direction of flow follows a flat spiral**
- 3/00 Apparatus in which the axial direction of the vortex remains unchanged**
- 3/02 • with heating or cooling, e.g. quenching, means
- 3/04 • Multiple arrangement thereof
- 3/06 • Construction of inlets or outlets to the vortex chamber
- 5/00 Apparatus in which the axial direction of the vortex is reversed**
- 5/02 • Construction of inlets by which the vortex flow is generated

- 7/14 • • • for separating walls of conical shape
- 7/16 • • • Sieves or filters (filters in general B01D; sieves in general B07B)
- 7/18 • • formed or coated with sieving or filtering elements (filters in general B01D; sieves in general B07B)

#### **9/00 Drives specially designed for centrifuges; Arrangement or disposition of transmission gearing; Suspending or balancing rotary bowls**

- 9/02 • Electric motor drives
- 9/04 • • Direct drive
- 9/06 • Fluid drive
- 9/08 • Arrangement or disposition of transmission gearing
- 9/10 • Control of the drive; Speed regulating
- 9/12 • Suspending rotary bowls
- 9/14 • Balancing rotary bowls (balancing in general G01M)

#### **11/00 Feeding, charging, or discharging bowls** (B04B 1/00, B04B 3/00, B04B 7/04 take precedence)

- 11/02 • Continuous feeding or discharging; Control arrangements therefor
- 11/04 • Periodical feeding or discharging; Control arrangements therefor
- 11/05 • • Base discharge
- 11/06 • Arrangement of distributors or collectors in centrifuges
- 11/08 • Skimmers or scrapers for discharging

#### **13/00 Control arrangements specially designed for centrifuges; Programme control of centrifuges** (control arrangements for feed, charge, or discharge B04B 11/00)

#### **15/00 Other accessories for centrifuges**

- 15/02 • for cooling, heating, or heat insulating
- 15/04 • for suppressing the formation of foam
- 15/06 • for cleaning bowls, filters, sieves, inserts, or the like
- 15/08 • for ventilating or producing a vacuum in the centrifuge
- 15/10 • for forming a filtering layer in the rotary bowl
- 15/12 • for drying or washing the separated solid particles

## B04C

- |       |  |       |   |
|-------|--|-------|---|
| 5/12  | • Construction of the overflow ducting, e.g. diffusing or spiral exits   | 5/24  | • Multiple arrangement thereof  |
| 5/13  | • • formed as a vortex finder and extending into the vortex chamber; Discharge from vortex finder otherwise than at the top of the cyclone; Devices for controlling the overflow | 5/26  | • • for series flow   |
| 5/14  | • Construction of the underflow ducting; Apex constructions; Discharge arrangements  | 5/28  | • • for parallel flow   |
| 5/15  | • • with swinging flaps or revolving sluices; Sluices; Check-valves  | 5/30  | • • Recirculation constructions in or with cyclones which accomplish a partial recirculation of the medium, e.g. by means of conduits   |
| 5/16  | • • with variable-size outlets from the underflow ducting  |       |   |
| 5/18  | • • with auxiliary fluid assisting discharge   | 7/00  | <b>Apparatus not provided for in group B04C 1/00, B04C 3/00 or B04C 5/00; Multiple arrangements not provided for in one of the groups B04C 1/00, B04C 3/00, or B04C 5/00; Combinations of apparatus covered by two or more of the groups B04C 1/00, B04C 3/00, or B04C 5/00</b> |
| 5/181 | • • Bulkheads or central bodies in the discharge opening   | 9/00  | <b>Combinations with other devices, e.g. fans</b> (with filters for separating particles from gases or vapour B01D 50/00; with dry electrostatic precipitation for separating particles from gases or vapour B03C 3/15)   |
| 5/185 | • • Dust collectors  |       |   |
| 5/187 | • • • forming an integral part of the vortex chamber   | 11/00 | <b>Accessories, e.g. safety or control devices, not otherwise provided for</b>  |
| 5/20  | • with heating or cooling, e.g. quenching, means   |       |   |
| 5/22  | • with cleaning means  |       |   |
| 5/23  | • • using liquids  |       |   |

## B05 SPRAYING OR ATOMISING IN GENERAL; APPLYING LIQUIDS OR OTHER FLUENT MATERIALS TO SURFACES, IN GENERAL

### Note(s)

In this class, the following terms or expressions are used with the meanings indicated:

- "other fluent materials" includes semiliquids, pastes, melts, solutions, dispersions, suspensions, particulate materials, gases or vapours;
- "particulate materials" includes powders, granules, short fibres or chips;
- "coating" means the materials applied. The coating may be a liquid having become solid after drying, e.g. paint.

**B05B SPRAYING APPARATUS; ATOMISING APPARATUS; NOZZLES** (spray-mixers with nozzles B01F 5/20; processes for applying liquids or other fluent materials to surfaces by spraying B05D) [2]

### Note(s)

1. This subclass covers particularly apparatus for the release or projection of drops or droplets into the atmosphere or into a chamber to form a mist or the like. For this purpose, the materials to be projected may be suspended in a stream of gas or vapour.
2. Attention is drawn to the Note following the title of class B05.

### Subclass index

APPARATUS CHARACTERISED BY THEIR STRUCTURE.....	3/00, 9/00, 11/00
APPARATUS FOR DISCHARGE OF FLUIDS FROM TWO OR MORE SOURCES.....	7/00
ELECTROSTATIC OR ELECTRIC APPARATUS.....	5/00
APPARATUS CHARACTERISED BY MANIPULATION THEREOF.....	11/00, 13/00
OTHER APPARATUS.....	17/00
OUTLETS OR OTHER DETAILS.....	1/00, 15/00
DELIVERY CONTROL.....	12/00

- |      |   |      |   |
|------|---|------|---|
| 1/00 | <b>Nozzles, spray heads or other outlets, with or without auxiliary devices such as valves, heating means</b> (B05B 3/00, B05B 5/00, B05B 7/00 take precedence; devices for applying liquids or other fluent materials to surfaces by contact B05C; nozzles for ink-jet printing mechanisms B41J 2/135; nozzles for liquid-dispensing, e.g. in vehicle service stations, B67D 7/42) | 1/06 | • • in annular, tubular or hollow conical form  |
|      |   | 1/08 | • • of pulsating nature, e.g. delivering liquid in successive separate quantities                                       |
|      |   | 1/10 | • • in the form of a fine jet, e.g. for use in wind-screen washers  |
|      |   | 1/12 | • capable of producing different kinds of discharge, e.g. either jet or spray (B05B 1/16 takes precedence)              |
| 1/02 | • designed to produce a jet, spray, or other discharge of particular shape or nature, e.g. in single drops (B05B 1/26, B05B 1/28, B05B 1/34 take precedence)  | 1/14 | • with multiple outlet openings (B05B 1/02, B05B 1/26 take precedence); with strainers in or outside the outlet opening |
| 1/04 | • • in flat form, e.g. fan-like, sheet-like   | 1/16 | • • having selectively-effective outlets  |

- 1/18 • • Roses; Shower heads
- 1/20 • • Perforated pipes or troughs, e.g. spray booms; Outlet elements therefor
- 1/22 • Spouts (anti-splash devices for water-taps E03C 1/08)
- 1/24 • incorporating means for heating the liquid or other fluent material, e.g. electrically
- 1/26 • with means for mechanically breaking-up or deflecting the jet after discharge, e.g. with fixed deflectors; Breaking-up the discharged liquid or other fluent material by impinging jets
- 1/28 • with integral means for shielding the discharged liquid or other fluent material, e.g. to limit area of spray; with integral means for catching drips or collecting surplus liquid or other fluent material (means for any of these purposes, per se, B05B 15/04)
- 1/30 • designed to control volume of flow, e.g. with adjustable passages (B05B 1/02 takes precedence)
- 1/32 • • in which a valve member forms part of the outlet opening
- 1/34 • designed to influence the nature of flow of the liquid or other fluent material, e.g. to produce swirl (B05B 1/30 takes precedence)
- 1/36 • Outlets for discharging by overflow
- 3/00 Spraying or sprinkling apparatus with moving outlet elements or moving deflecting elements (B05B 5/00 takes precedence)**
  - 3/02 • with rotating elements
  - 3/04 • • driven by the liquid or other fluent material discharged, e.g. the liquid actuating a motor before passing to the outlet
  - 3/06 • • • by jet reaction
  - 3/08 • • in association with stationary outlet or deflecting elements
  - 3/10 • • discharging over substantially the whole periphery of the rotating member
  - 3/12 • • with spray booms or the like rotating around an axis by means independent of the liquid or other fluent material discharged
  - 3/14 • with oscillating elements; with intermittent operation
  - 3/16 • • driven or controlled by the liquid or other fluent material discharged, e.g. the liquid actuating a motor before passing to the outlet
  - 3/18 • with elements moving in a straight line, e.g. along a track; Mobile sprinklers [2]
- 5/00 Electrostatic spraying apparatus; Spraying apparatus with means for charging the spray electrically; Apparatus for spraying liquids or other fluent materials by other electric means**
  - 5/025 • Discharge apparatus, e.g. electrostatic spray guns [5]
  - 5/03 • • characterised by the use of gas [5]
  - 5/035 • • characterised by gasless spraying [5]
  - 5/04 • • characterised by having rotary outlet or deflecting elements
  - 5/043 • • using induction-charging [5]
  - 5/047 • • using tribo-charging [5]
  - 5/053 • • Arrangements for supplying power, e.g. charging power [5]
  - 5/057 • • Arrangements for discharging liquids or other fluent material without using a gun or nozzle [5]
  - 5/06 • using electric arc
  - 5/08 • Plant for applying liquids or other fluent materials to objects
  - 5/10 • • Arrangements for supplying power, e.g. charging power (B05B 5/053 takes precedence) [5]
- 5/12 • • specially adapted for coating the interior of hollow bodies [5]
- 5/14 • • specially adapted for coating continuously moving elongated bodies, e.g. wires, strips, pipes [5]
- 5/16 • Arrangements for supplying liquids or other fluent material [5]
- 7/00 Spraying apparatus for discharge of liquids or other fluent materials from two or more sources, e.g. of liquid and air, of powder and gas (B05B 3/00, B05B 5/00 take precedence; outlets not specially modified for two media B05B 1/00)**
  - 7/02 • Spray pistols; Apparatus for discharge (B05B 7/14, B05B 7/16, B05B 7/24 take precedence)
  - 7/04 • • with arrangements for mixing liquids or other fluent materials before discharge [2]
  - 7/06 • • with one outlet orifice surrounding another approximately in the same plane (B05B 7/10 takes precedence)
  - 7/08 • • with separate outlet orifices, e.g. to form parallel jets, to form intersecting jets
  - 7/10 • • producing a swirling discharge
  - 7/12 • • designed to control volume of flow, e.g. with adjustable passages
  - 7/14 • designed for spraying particulate materials (B05B 7/16 takes precedence)
  - 7/16 • incorporating means for heating the material to be sprayed
  - 7/18 • • the material having originally the shape of a wire, rod, or the like
  - 7/20 • • by flame or combustion
  - 7/22 • • electrically, e.g. by arc
  - 7/24 • with means, e.g. a container, for supplying liquid or other fluent material to a discharge device (B05B 7/14, B05B 7/16, B05B 11/00 take precedence)
  - 7/26 • • Apparatus in which liquids or other fluent materials from different sources are brought together before entering the discharge device
  - 7/28 • • • in which one liquid or other fluent material is fed or drawn through an orifice into a stream of a carrying fluid
  - 7/30 • • • • the first liquid or other fluent material being fed by gravity, or sucked into the carrying fluid
  - 7/32 • • • • the fed liquid or other fluent material being under pressure
- 9/00 Spraying apparatus for discharge of liquid or other fluent material without essentially mixing with gas or vapour (B05B 11/00 takes precedence) [3]**
  - 9/01 • Spray pistols (B05B 9/03 takes precedence) [3]
  - 9/03 • characterised by means for supplying liquid or other fluent material [3]
  - 9/04 • • with pressurised or compressible container (aerosol containers B65D 83/14); with pump [3]
  - 9/043 • • • having pump readily separable from container [2, 3]
  - 9/047 • • • supply being effected by follower in container, e.g. membrane or floating piston [2, 3]
  - 9/06 • • • the delivery being related to the movement of a vehicle, e.g. the pump being driven by a vehicle wheel [3]
  - 9/08 • • • Apparatus to be carried on or by a person, e.g. of knapsack type (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [3, 4]

## B05B

- |       |  |       |  |
|-------|--|-------|--|
| 11/00 | <b>Single-unit, i.e. unitary, hand-held apparatus in which flow of liquid or other fluent material is produced by the operator at the moment of use [2]</b>  | 13/02 | • Means for supporting work; Arrangement or mounting of spray heads; Adaptation or arrangement of means for feeding work (B05B 13/06 takes precedence)   |
| 11/02 | • the flow being effected by a follower, e.g. membrane, floating piston, in container for liquid or other fluent material [2]  | 13/04 | • • the spray heads being moved during operation   |
| 11/04 | • the flow being effected by deformation of container for liquid or other fluent material [2]  | 13/06 | • specially designed for treating the inside of hollow bodies (spray heads B05B 1/00-B05B 7/00)  |
| 11/06 | • the spray being effected by gas or vapour flow, e.g. from a compressible bulb [2, 3]   | 15/00 | <b>Details of spraying plant or apparatus not otherwise provided for; Accessories [4]</b>  |
| 12/00 | <b>Arrangements or special adaptations of delivery controlling means in spraying systems [2]</b>   | 15/02 | • Arrangements or devices for cleaning discharge openings  |
| 12/02 | • for controlling time, or sequence, of delivery [2]   | 15/04 | • Control of spray area, e.g. masking, side shields; Means for collection or re-use of excess material (B05B 1/28 takes precedence)  |
| 12/04 | • • for sequential operation or multiple outlets [2]   | 15/06 | • Mountings, supporting or holding means, or rests for spray heads or other outlets when in use or out of use (B05B 15/10 takes precedence)  |
| 12/06 | • • for effecting pulsating flow [2]   | 15/08 | • • Means for adjusting position of spray heads  |
| 12/08 | • responsive to condition of liquid or other fluent material discharged, of ambient medium or of target [2]  | 15/10 | • Arrangements for moving spray heads automatically to or from the working position  |
| 12/10 | • • responsive to temperature or viscosity of liquid or other fluent material discharged [2]   | 15/12 | • Spray booths [4]   |
| 12/12 | • • responsive to conditions of ambient medium or target, e.g. humidity, temperature [2]   | 17/00 | <b>Apparatus for spraying or atomising liquids or other fluent materials, not covered by any other group of this subclass (dropping or releasing powdered, liquid or gaseous matter in flight B64D 1/16) [2]</b> |
| 12/14 | • for supplying a selected one of a plurality of liquids or other fluent materials to a single spray outlet [3]  | 17/04 | • operating with special methods   |
| 13/00 | <b>Machines or plants for applying liquids or other fluent materials to surfaces of objects or other work by spraying, not covered by groups B05B 1/00-B05B 11/00 (processes for applying liquids or other fluent materials to surfaces in general B05D; means for supplying or discharging liquid or other fluent material for this purpose, see the relevant one of groups B05B 1/00-B05B 12/00) [3]</b> | 17/06 | • • using ultrasonic vibrations  |
|       |  | 17/08 | • Fountains (drinking fountains E03B 9/20; wash fountains E03C 1/16)   |

**B05C APPARATUS FOR APPLYING LIQUIDS OR OTHER FLUENT MATERIALS TO SURFACES, IN GENERAL** (spraying apparatus, atomising apparatus, nozzles B05B; plant for applying liquids or other fluent materials to objects by electrostatic spraying B05B 5/08; processes for applying liquids or other fluent materials to surfaces B05D) [2]

### Note(s)

- This subclass covers apparatus or hand tools, in general, for applying liquids or other fluent materials to a surface or a part thereof, by any mechanical or physical method, in particular apparatus for obtaining a uniform distribution of liquids or other fluent materials on a surface.
- Hand tools or apparatus using hand-held tools are classified in group B05C 17/00.
- Attention is drawn to the Note following the title of class B05.

### Subclass index

APPARATUS CHARACTERISED BY THE MEANS USED.....1/00, 3/00, 5/00, 9/00  
 APPARATUS FOR SPECIAL WORK OR MATERIALS.....7/00, 19/00  
 HAND TOOLS.....17/00  
 DETAILS OR ACCESSORIES.....11/00, 13/00, 15/00, 17/00, 21/00

- |      |  |      |  |
|------|--|------|--|
| 1/00 | <b>Apparatus in which liquid or other fluent material is applied to the surface of the work by contact with a member carrying the liquid or other fluent material, e.g. a porous member loaded with a liquid to be applied as a coating (B05C 5/02, B05C 7/00, B05C 19/00 take precedence) [2]</b> | 1/08 | • • using a roller [2]   |
| 1/02 | • for applying liquid or other fluent material to separate articles  | 1/10 | • • • the liquid or other fluent material being supplied from inside the roller  |
| 1/04 | • for applying liquid or other fluent material to work of indefinite length  | 1/12 | • • • the work being fed round the roller (B05C 1/10 takes precedence)   |
| 1/06 | • • by rubbing contact, e.g. by brushes, by pads   | 1/14 | • • using a travelling band [2]  |
|      |  | 1/16 | • • only at particular parts of the work   |
|      |  | 3/00 | <b>Apparatus in which the work is brought into contact with a bulk quantity of liquid or other fluent material (B05C 19/00 takes precedence) [2]</b> |

- 3/02 • the work being immersed in the liquid or other fluent material
- 3/04 • • with special provision for agitating the work or the liquid or other fluent material
- 3/05 • • • by applying vibrations thereto
- 3/08 • • • the work and the liquid or other fluent material being agitated together in a container, e.g. tumbled (B05C 3/05 takes precedence)
- 3/09 • • for treating separate articles
- 3/10 • • • the articles being moved through the liquid or other fluent material (conveying articles through baths B65G, e.g. B65G 49/02)
- 3/109 • • • Passing liquids or other fluent materials into or through chambers containing stationary articles
- 3/12 • • for treating work of indefinite length
- 3/132 • • • supported on conveying means
- 3/15 • • • not supported on conveying means (web or filament feeding arrangements B65H)
- 3/152 • • • • the work passing in zig-zag fashion over rollers
- 3/172 • • • • in endless form
- 3/18 • only one side of the work coming into contact with the liquid or other fluent material (B05C 3/02 takes precedence) [2]
- 3/20 • for applying liquid or other fluent material only at particular parts of the work (B05C 3/02 takes precedence) [2]
- 5/00 Apparatus in which liquid or other fluent material is projected, poured or allowed to flow on to the surface of the work** (B05C 7/00, B05C 19/00 take precedence; essentially involving spraying or electrostatic projection B05B)
- 5/02 • from an outlet device in contact, or almost in contact, with the work (B05C 5/04 takes precedence) [3]
- 5/04 • the liquid or other fluent material being supplied to the apparatus in a solid state and melted before application [3]
- 7/00 Apparatus specially designed for applying liquid or other fluent material to the inside of hollow work** (B05C 19/00 takes precedence)
- 7/02 • the liquid or other fluent material being projected
- 7/04 • the liquid or other fluent material flowing or being moved through the work; the work being filled with liquid or other fluent material and emptied
- 7/06 • by devices moving in contact with the work
- 7/08 • • for applying liquids or other fluent materials to the inside of tubes
- 9/00 Apparatus or plant for applying liquid or other fluent material to surfaces by means not covered by groups B05C 1/00-B05C 7/00, or in which the means of applying the liquid or other fluent material is not important** (B05C 19/00 takes precedence)
- 9/02 • for applying liquid or other fluent material to surfaces by single means not covered by groups B05C 1/00-B05C 7/00, whether or not also using other means
- 9/04 • for applying liquid or other fluent material to opposite sides of the work
- 9/06 • for applying two different liquids or other fluent materials, or the same liquid or other fluent material twice, to the same side of the work
- 9/08 • for applying liquid or other fluent material and performing an auxiliary operation [2]
- 9/10 • • the auxiliary operation being performed before the application (B05C 9/14 takes precedence)
- 9/12 • • the auxiliary operation being performed after the application (B05C 9/14 takes precedence)
- 9/14 • • the auxiliary operation involving heating
- 11/00 Component parts, details or accessories not specifically provided for in groups B05C 1/00-B05C 9/00** (B05C 19/00 takes precedence; means for manipulating or holding work B05C 13/00; enclosures for apparatus, booths B05C 15/00; spray booths B05B 15/12) [2]
- 11/02 • Apparatus for spreading or distributing liquids or other fluent materials already applied to a surface (B05C 7/00 takes precedence; hand tools for such purposes B05C 17/10); Control of the thickness of a coating (controlling supply of liquid or other fluent material B05C 11/10) [2]
- 11/04 • • with blades
- 11/06 • • with a blast of gas or vapour [2]
- 11/08 • • Spreading liquid or other fluent material by manipulating the work, e.g. tilting
- 11/10 • Storage, supply or control of liquid or other fluent material; Recovery of excess liquid or other fluent material
- 11/105 • • by capillary action, e.g. using wicks
- 11/11 • Vats or other containers for liquids or other fluent materials
- 11/115 • • Sealing means for work inlet or outlet
- 13/00 Means for manipulating or holding work, e.g. for separate articles** [2]
- 13/02 • for particular articles [2]
- 15/00 Enclosures for apparatus; Booths** (spray booths B05B 15/12) [4]
- 17/00 Hand tools or apparatus using hand-held tools, for applying liquids or other fluent materials to, for spreading applied liquids or other fluent materials on, or for partially removing applied liquids or other fluent materials from, surfaces** (brushes A46B; absorbent pads, e.g. swabs, for applying media to the human body A61F 13/15; implements or apparatus for removing dry paint from surfaces B44D 3/16) [2]
- 17/005 • for discharging material through an outlet orifice by pressure (B05C 17/02 takes precedence; containers or packages with special means for dispensing fluent material by means of a piston or the like B65D 83/76; grease guns F16N 3/12) [5]
- 17/01 • • with mechanically or electrically actuated piston or the like [5]
- 17/015 • • with pneumatically actuated piston or the like [5]
- 17/02 • Rollers [2]
- 17/025 • • with self-contained reservoir [5]
- 17/03 • • with feed system for supplying material from an external source [5]
- 17/035 • • • direct to the outer surface of the roller [5]
- 17/04 • • Stencil rollers [2]
- 17/06 • Stencils (B05C 17/04 takes precedence; stencils used in connection with printing plates or foils B41N 1/24; drawing accessories B43L 13/00) [2]
- 17/08 • • Stencil holders [2]
- 17/10 • Hand tools for removing partially or for spreading or redistributing applied liquids or other fluent materials, e.g. colour touchers [2]
- 17/12 • Other hand tools for producing patterns [2]
- 19/00 Apparatus specially adapted for applying particulate materials to surfaces** [2]

## B05C

- 19/02 • using fluidised-bed technique (fluidised-bed technique in general B01J 8/24) [2]
- 19/04 • the particulate material being projected, poured or allowed to flow onto the surface of the work (B05C 19/02 takes precedence; involving spraying or electrostatic projection B05B) [5]
- 19/06 • Storage, supply or control of the application of particulate material; Recovery of excess particulate material [5]

**21/00 Accessories or implements for use in connection with applying liquids or other fluent materials to surfaces, not provided for in groups B05C 1/00-B05C 19/00** (accessories or implements for use in connection with painting or artistic drawing and fully provided for in B44D 3/02-B44D 3/38, *see* subgroups of group B44D 3/00) [2]

**B05D PROCESSES FOR APPLYING LIQUIDS OR OTHER FLUENT MATERIALS TO SURFACES, IN GENERAL** (apparatus for applying liquids or other fluent materials to surfaces B05B, B05C; conveying articles or workpieces through baths of liquid B65G, e.g. B65G 49/02) [2]

### Note(s)

1. This subclass *covers*:
  - processes for applying liquids or other fluent materials to a surface or part of a surface, in general, by any mechanical or physical method and particularly processes producing a uniform distribution of liquids or other fluent materials on a surface;
  - pretreatment of surfaces to which liquids or other fluent materials are to be applied;
  - after-treatment of applied coatings.
2. Attention is drawn to the Note following the title of class B05.

### Subclass index

#### PROCESSES CHARACTERISED BY

means used.....	1/00
special result obtained.....	5/00
surfaces to be treated.....	7/00

PRETREATMENT OF SURFACES; AFTER-TREATMENT OF COATINGS.....3/00

#### **1/00 Processes for applying liquids or other fluent materials** (B05D 5/00, B05D 7/00 take precedence) [2]

- 1/02 • performed by spraying [2]
- 1/04 • • involving the use of an electrostatic field [2]
- 1/06 • • • Applying particulate materials [2]
- 1/08 • • Flame spraying [2]
- 1/10 • • • Applying particulate materials [2]
- 1/12 • • Applying particulate materials (B05D 1/06, B05D 1/10 take precedence) [2]
- 1/14 • • • Flocking [2]
- 1/16 • Flocking otherwise than by spraying [2]
- 1/18 • performed by dipping [2]
- 1/20 • • substances to be applied floating on a fluid [2]
- 1/22 • • using fluidised-bed technique (fluidised-bed technique in general B01J 8/24) [2]
- 1/24 • • • Applying particulate materials [2]
- 1/26 • performed by applying the liquid or other fluent material from an outlet device in contact with, or almost in contact with, the surface [2]
- 1/28 • performed by transfer from the surfaces of elements carrying the liquid or other fluent material, e.g. brushes, pads, rollers [2]
- 1/30 • performed by gravity only, i.e. flow coating [2]
- 1/32 • using means for protecting parts of a surface not to be coated, e.g. using stencils, resists [2]
- 1/34 • Applying different liquids or other fluent materials simultaneously [2]
- 1/36 • Successively applying liquids or other fluent materials, e.g. without intermediate treatment [2]
- 1/38 • • with intermediate treatment (intermediate treatment *per se* B05D 3/00) [2]
- 1/40 • Distributing applied liquids or other fluent materials by members moving relatively to surface [2]

- 1/42 • • by non-rotary members [2]

#### **3/00 Pretreatment of surfaces to which liquids or other fluent materials are to be applied; After-treatment of applied coatings, e.g. intermediate treating of an applied coating preparatory to subsequent applications of liquids or other fluent materials** (successively applying liquids or other fluent materials B05D 1/36; drying ovens F26B) [2]

- 3/02 • by baking [2]
- 3/04 • by exposure to gases [2]
- 3/06 • by exposure to radiation (B05D 3/02 takes precedence) [2]
- 3/08 • by flames [2]
- 3/10 • by other chemical means [2]
- 3/12 • by mechanical means [2]
- 3/14 • by electrical means [2]

#### **5/00 Processes for applying liquids or other fluent materials to surfaces to obtain special surface effects, finishes or structures** [2]

- 5/02 • to obtain a matt or rough surface [2]
- 5/04 • to obtain a surface receptive to ink or other liquid (B05D 5/02 takes precedence) [2]
- 5/06 • to obtain multicolour or other optical effects (B05D 5/02 takes precedence) [2]
- 5/08 • to obtain an anti-friction or anti-adhesive surface (rendering particulate materials free flowing in general, e.g. making them hydrophobic, B01J 2/30) [2]
- 5/10 • to obtain an adhesive surface [2]
- 5/12 • to obtain a coating with specific electrical properties [2]

- |   |   |
|---|---|
| <p>7/00 <b>Processes, other than flocking, specially adapted for applying liquids or other fluent materials to particular surfaces or for applying particular liquids or other fluent materials [2]</b></p> <p>7/02 • to macromolecular substances, e.g. rubber (treatment or coating of shaped articles made of macromolecular substances C08J 7/00) [2]</p> <p>7/04 • • to surfaces of films or sheets (producing layered products by applying coatings of pasty or pulverulent plastics B29C 41/00, B32B 37/00) [2]</p> <p>7/06 • to wood [2]</p> <p>7/08 • • using synthetic lacquers or varnishes [2]</p> <p>7/10 • • • based on cellulose derivatives [2]</p> | <p>7/12 • to leather (chemical treatment of leather C14C; dyeing leather D06P) [2]</p> <p>7/14 • to metal, e.g. car bodies (involving a chemical reaction between the metal and the coating C23) [2]</p> <p>7/16 • • using synthetic lacquers or varnishes [2]</p> <p>7/18 • • • based on cellulose derivatives [2]</p> <p>7/20 • to wires (for insulating electric cables H01B 13/16) [2]</p> <p>7/22 • to internal surfaces, e.g. of tubes [2]</p> <p>7/24 • for applying particular liquids or other fluent materials [2]</p> <p>7/26 • • synthetic lacquers or varnishes (B05D 7/08, B05D 7/16 take precedence) [2]</p> |
|---|---|

## B06 GENERATING OR TRANSMITTING MECHANICAL VIBRATIONS IN GENERAL

**B06B GENERATING OR TRANSMITTING MECHANICAL VIBRATIONS IN GENERAL** (for particular physical or chemical processes, see the relevant subclasses, e.g. B07B 1/40, B22C 19/06, B23Q 17/12, B24B 31/06, E01C 19/22; measurement of mechanical vibrations, including the combination of generation and measurement, G01H; systems using reflection or reradiation of acoustic waves G01S 15/00; generating seismic energy for prospecting G01V 1/02; control of mechanical vibrations G05D 19/00; methods or devices for transmitting, conducting or directing sound, in general G10K 11/00; synthesis of acoustic waves G10K 15/02; piezo-electric, electrostrictive or magnetostrictive elements H01L 41/00; motors with vibrating magnet, armature or coil H02K 33/00; motors using piezo-electric effect, electrostriction or magnetostriction H02N 2/00; generation of electrical oscillations H03B; electromechanical resonators as resonant circuit elements H03H; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R) [2]

### Note(s)

1. This subclass covers arrangements for generating mechanical vibrations in solids, e.g. for the purpose of performing mechanical work.
2. This subclass does not cover arrangements for generating mechanical vibrations in fluids, which are covered by subclass G10K.

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|--|---|
| <p>1/00 <b>Processes or apparatus for generating mechanical vibrations of infrasonic, sonic or ultrasonic frequency</b></p> <p>1/02 • making use of electrical energy (B06B 1/18, B06B 1/20 take precedence)</p> <p>1/04 • • operating with electromagnetism (dynamo-electric motors with vibrating magnet, armature or coil system H02K 33/00)</p> <p>1/06 • • operating with piezo-electric effect or with electrostriction (piezo-electric or electrostrictive elements in general H01L 41/00)</p> <p>1/08 • • operating with magnetostriction (magnetostrictive elements in general H01L 41/00)</p> <p>1/10 • making use of mechanical energy (B06B 1/18, B06B 1/20 take precedence)</p> | <p>1/12 • • operating with systems involving reciprocating masses</p> <p>1/14 • • • the masses being elastically coupled</p> <p>1/16 • • operating with systems involving rotary unbalanced masses</p> <p>1/18 • wherein the vibrator is actuated by pressure fluid (B06B 1/20 takes precedence)</p> <p>1/20 • making use of a vibrating fluid</p> <p>3/00 <b>Processes or apparatus specially adapted for transmitting mechanical vibrations of infrasonic, sonic or ultrasonic frequency</b></p> <p>3/02 • involving a change of amplitude</p> <p>3/04 • involving focusing or reflecting</p> |
|--|---|

## B07 SEPARATING SOLIDS FROM SOLIDS; SORTING

**B07B SEPARATING SOLIDS FROM SOLIDS BY SIEVING, SCREENING, OR SIFTING OR BY USING GAS CURRENTS; OTHER SEPARATING BY DRY METHODS APPLICABLE TO BULK MATERIAL, e.g. LOOSE ARTICLES FIT TO BE HANDLED LIKE BULK MATERIAL** (wet separating processes, sorting by processes using fluent material in the same way as liquid B03; combinations of dry separating apparatus with wet separating apparatus B03B; using liquids B03B, B03D; sorting by magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high voltage electric fields B03C; centrifuges or vortex apparatus for carrying out physical processes B04; hand sorting, postal sorting, sorting by switching or other devices actuated in response to detection or measurement of some feature of articles or samples of material B07C)

### Note(s)

This subclass covers:

- any sorting or grading of bulk material or loose articles fit to be handled like bulk material which results automatically from the construction of the apparatus and properties of the material, e.g. by a trap opening under an object of a certain minimum weight, by an aperture of graduated size;
- sorting of articles in so far as the same conditions apply, e.g. sorting of timber by passing it over successively longer openings; the articles may or may not be orientated for the purpose of sorting.

### Subclass index

SEPARATING SOLIDS FROM SOLIDS USING NETWORKS, GRATINGS, OR GRIDS.....	1/00
SEPARATING SOLIDS FROM SOLIDS USING GAS CURRENTS.....	4/00, 7/00, 9/00, 11/00
OTHER SEPARATING; COMBINATIONS.....	13/00, 15/00

#### 1/00 Sieving, screening, sifting, or sorting solid materials using networks, gratings, grids, or the like

- 1/02 • Hand screens
- 1/04 • Stationary flat screens
- 1/06 • Cone or disc shaped screens
- 1/08 • Screens rotating within their own plane
- 1/10 • Screens in the form of endless moving bands
- 1/12 • Apparatus having only parallel elements
- 1/14 • • Roller screens
- 1/15 • • • using corrugated, grooved or ribbed rollers [2]
- 1/16 • • the elements being movable and in other than roller form
- 1/18 • Drum screens
- 1/20 • • Stationary drums with moving interior agitators
- 1/22 • • Revolving drums
- 1/24 • • • with fixed or moving interior agitators
- 1/26 • • • with additional axial or radial movement of the drum
- 1/28 • Moving screens not otherwise provided for, e.g. swinging, reciprocating, rocking, tilting, or wobbling screens

#### Note(s)

Group B07B 1/40 takes precedence over groups B07B 1/30-B07B 1/38.

- 1/30 • • jigging or moving to-and-fro in or approximately in the direction of conveyance
- 1/32 • • jigging or moving to-and-fro within their own plane transverse to the direction of conveyance
- 1/34 • • jigging or moving to-and-fro perpendicularly or approximately perpendicularly to the plane of the screen
- 1/36 • • jigging or moving to-and-fro in more than one direction
- 1/38 • • oscillating in a circular arc in their own plane; Plansifters
- 1/40 • • Resonant vibration screens
- 1/42 • Drive mechanisms, regulating or controlling devices, or balancing devices, specially adapted for screens
- 1/44 • • Balancing devices
- 1/46 • Constructional details of screens in general; Cleaning or heating of screens
- 1/48 • • Stretching devices for screens
- 1/49 • • • stretching more than one screen or screen section by the same or different stretching means [2]
- 1/50 • • Cleaning
- 1/52 • • • with brushes or scrapers
- 1/54 • • • with beating devices
- 1/55 • • • with fluid jets [3]
- 1/56 • • Heated screens
- 1/58 • • • heated by heated fluid
- 1/60 • • • heated by flame heating

- 1/62 • • • heated by direct electric heating

#### Separating solids from solids using gas currents

#### 4/00 Separating solids from solids by subjecting their mixture to gas currents (using tables or jigs B03B)

- 4/02 • while the mixtures fall
- 4/04 • • in cascades
- 4/06 • • using revolving drums
- 4/08 • while the mixtures are supported by sieves, screens, or like mechanical elements

#### 7/00 Selective separation of solid materials carried by, or dispersed in, gas currents (sieves or filters for separating dispersed particles from gases or vapours B01D)

- 7/01 • using gravity
- 7/02 • by reversal of direction of flow
- 7/04 • by impingement against baffle separators
- 7/06 • by impingement against sieves
- 7/08 • using centrifugal force
- 7/083 • • generated by rotating vanes, discs, drums, or brushes
- 7/086 • • generated by the winding course of the gas stream
- 7/10 • • having air recirculating within the apparatus
- 7/12 • with pulsating air currents

#### 9/00 Combinations of apparatus for screening or sifting or for separating solids from solids using gas currents; General arrangement of plant, e.g. flow sheets

- 9/02 • Combinations of similar or different apparatus for separating solids from solids using gas currents

#### 11/00 Arrangement of accessories in apparatus for separating solids from solids using gas currents

- 11/02 • Arrangement of air or material conditioning accessories
- 11/04 • Control arrangements
- 11/06 • Feeding or discharging arrangements
- 11/08 • Cleaning arrangements

#### Other separating, e.g. grading, resulting automatically from the construction of the apparatus used and properties of the material concerned; Combinations

#### 13/00 Grading or sorting solid materials by dry methods, not otherwise provided for; Sorting articles otherwise than by indirectly controlled devices

- 13/02 • Apparatus for grading using pockets for taking out particles from aggregates
- 13/04 • according to size



- |  |  |
|--|--|
| 13/05 • • using material mover cooperating with retainer, deflector or discharger (B07B 13/065-B07B 13/075 take precedence) [3]<br>13/065 • • Apparatus for grading or sorting using divergent conveyer belts or cables [3]<br>13/07 • • Apparatus in which aggregates or articles are moved along or past openings which increase in size in the direction of movement [3]<br>13/075 • • Apparatus comprising moving article-receiving openings, the size of which varies as they move [3]<br>13/08 • according to weight (B07B 13/10 takes precedence) | 13/10 • using momentum effects<br>13/11 • • involving travel of particles over surfaces which separate by centrifugal force or by relative friction between particles and such surfaces, e.g. helical sorters [2]<br>13/14 • Details or accessories<br>13/16 • • Feed or discharge arrangements<br>13/18 • • Control<br><br><b>15/00 Combinations of apparatus for separating solids from solids by dry methods applicable to bulk material, e.g. loose articles fit to be handled like bulk material</b> (using gas currents B07B 9/00) |
|--|--|

**B07C POSTAL SORTING; SORTING INDIVIDUAL ARTICLES, OR BULK MATERIAL FIT TO BE SORTED PIECE-MEAL, e.g. BY PICKING** (specially adapted for a specific purpose covered by another class, see the relevant place, e.g. A43D 33/06, B23Q 7/12)

### Note(s)

This subclass covers sorting of materials or articles by hand or by devices actuated, manually or automatically, as a result of inspection or of detection or measurement of some feature of the material or articles.

### Subclass index

SORTING CHARACTERISED BY THE METHOD.....5/00, 7/00, 99/00  
SORTING ACCORDING TO DESTINATION.....1/00, 3/00

### Postal sorting; Similar sorting of documents, e.g. cheques

- |      |  |
|------|--|
| 3/20 | • Arrangements for facilitating the visual reading of addresses, e.g. display arrangements |
|------|--|

#### **1/00 Measures preceding sorting of mail or documents according to destination**

- |      |   |
|------|---|
| 1/02 | • Forming articles into a stream; Arranging articles in a stream, e.g. spacing, orientating |
| 1/04 | • • Forming a stream from a bulk; Regulating the stream, e.g. spacing the articles          |
| 1/06 | • • Orientating; Aligning   |
| 1/10 | • Sorting according to size or flexibility  |
| 1/12 | • • Separating letters from parcels   |
| 1/14 | • • Sorting according to length or width  |
| 1/16 | • • Sorting according to thickness or stiffness   |
| 1/18 | • Orientating articles other than in a stream   |
| 1/20 | • Sorting according to orientation, e.g. according to position of stamp                     |

#### **3/00 Sorting of mail or documents according to destination**

- |      |   |
|------|---|
| 3/02 | • Apparatus characterised by the means used for distribution  |
| 3/04 | • • Drum-type sorting machines  |
| 3/06 | • • Linear sorting machines in which articles are removed from a stream at selected points  |
| 3/08 | • • using arrangements of conveyers   |
| 3/10 | • Apparatus characterised by the means used for detection of the destination (methods or arrangements for reading and recognising printed or written characters or geometric figures G06K 9/00) |
| 3/12 | • • using electric or electronic detecting means (B07C 3/14 takes precedence)   |
| 3/14 | • • using light-responsive detecting means  |
| 3/16 | • • using magnetic detecting means  |
| 3/18 | • Devices or arrangements for indicating destination, e.g. by code marks  |

- |             |   |
|-------------|---|
| <b>5/00</b> | <b>Sorting according to a characteristic or feature of the articles or material being sorted, e.g. by control effected by devices which detect or measure such characteristic or feature; Sorting by manually actuated devices, e.g. switches</b> (sorting by hand only B07C 7/00; separating solids from solids by sieving, screening, or sifting or by using gas currents or other separating by dry methods applicable to bulk material B07B; sorting of coins G07D) [3] |
|-------------|---|

- |      |   |
|------|---|
| 5/02 | • Measures preceding sorting, e.g. arranging articles in a stream, orientating                                    |
| 5/04 | • Sorting according to size   |
| 5/06 | • • measured mechanically   |
| 5/07 | • • • by caliper using relatively moving article-engaging means, e.g. clamps [2]                                  |
| 5/08 | • • measured electrically or electronically (B07C 5/10 takes precedence)  |
| 5/10 | • • measured by light-responsive means  |
| 5/12 | • • characterised by the application to particular articles, not otherwise provided for (sorting eggs A01K 43/00) |
| 5/14 | • • • Sorting timber or logs  |
| 5/16 | • Sorting according to weight (sorting eggs A01K 43/00; weighing apparatus <u>per se</u> G01G)                    |
| 5/18 | • • using a single stationary weighing mechanism  |
| 5/20 | • • • for separating articles of less than a predetermined weight from those of more than that weight             |
| 5/22 | • • using a plurality of stationary weighing mechanisms   |

## B07C

- 5/24 • • using moving weighing mechanisms, e.g. moving along a circular path
- 5/26 • • • wherein the counterbalancing effect of the weighing mechanisms is varied during such movement
- 5/28 • • using electrical control means
- 5/30 • • with associated counting means
- 5/32 • • with associated check-weighing means
- 5/34 • Sorting according to other particular properties
- 5/342 • • according to optical properties, e.g. colour
- 5/344 • • according to electric or electromagnetic properties
- 5/346 • • according to radioactive properties
- 5/36 • Sorting apparatus characterised by the means used for distribution
- 5/38 • • Collecting or arranging articles in groups
- 7/00 Sorting by hand only**
- 7/02 • Compartmented furniture, e.g. pigeon-holes (storage racks B65G)
- 7/04 • Apparatus or accessories for hand picking
- 99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

## B08 CLEANING

**B08B CLEANING IN GENERAL; PREVENTION OF FOULING IN GENERAL** (brushes A46; devices for domestic or like cleaning A47L; separation of particles from liquids or gases B01D; separation of solids B03, B07; spraying or applying liquids or other fluent materials to surfaces in general B05; cleaning devices for conveyers B65G 45/10; concurrent cleaning, filling and closing of bottles B67C 7/00; inhibiting corrosion or incrustation in general C23; cleaning streets, permanent ways, beaches or land E01H; parts, details or accessories of swimming or splash baths or pools, specially adapted for cleaning E04H 4/16; preventing or removing electrostatic charges H05F)

### Note(s)

1. This subclass covers only cleaning, which is usually classified according to one (or more) of the aspects mentioned below, if it is not fully classifiable in a subclass providing for any of the following aspects:
  - the articles cleaned, e.g. bed-pans, urinal or other sanitary devices for bed-ridden persons A61G 9/02, filters, semi-permeable membranes B01D, castings and moulds B22D 29/00, vehicles B60S, coke ovens C10B 43/00, building forms E04G, boilers F22, combustion apparatus F23J, furnaces F27;
  - the general nature of the cleaning, e.g. preparing for sugar manufacture A23N, domestic cleaning A47L, treatment of textiles D06, laundry D06F, air-conditioning F24F;
  - the particular operation performed, e.g. filtering B01D, separating of solids B03, B07, sand-blasting B24C;
  - the particular apparatus or device, e.g. brushes A46B, mops A47L, centrifuges B04, hand tools B25;
  - the substance cleaned, e.g. metals B21C, C23, water C02, glass C03B, leather C14B, textile fibres D01;
  - the substance removed (or prevented from depositing or forming), e.g. implements or apparatus for removing dry paint from surfaces B44D 3/16, chemical paint-removers C09D 9/00, preventing rust C23F;
  - the substance used, e.g. macromolecular compounds or compositions C08, anti-icing materials C09K, detergents C11D;
  - the operation in connection with which cleaning is done, e.g. metal rolling B21B, metal boring B23B, soldering B23K, textile fabrication D01G, D01H, D03J, D04B;
  - the surroundings of a surface to be cleaned or kept clean, e.g. water in a boiler C02F, air in a room F24F.
2. Processes using enzymes or micro-organisms in order to:
  - i. liberate, separate or purify a pre-existing compound or composition, or to
  - ii. treat textiles or clean solid surfaces of materialsare further classified in subclass C12S.

### Subclass index

CLEANING CHARACTERISED BY THE MEANS USED.....1/00, 3/00, 5/00, 6/00, 7/00  
CLEANING HOLLOW, FLEXIBLE OR DELICATE ARTICLES.....9/00, 11/00  
ACCESSORIES OR DETAILS OF MACHINES.....13/00  
PREVENTING FOULING OR ESCAPE OF DIRT OR FUMES.....15/00, 17/00

- 
- 1/00 Cleaning by methods involving the use of tools, brushes, or analogous members** (B08B 3/12, B08B 6/00, B08B 9/00 take precedence) [2]
  - 1/02 • Cleaning travelling work, e.g. a web, articles on a conveyer
  - 1/04 • using rotary operative members (B08B 1/02 takes precedence)
  - 3/00 Cleaning by methods involving the use or presence of liquid or steam** (B08B 9/00 takes precedence)
  - 3/02 • Cleaning by the force of jets or sprays
  - 3/04 • Cleaning involving contact with liquid
  - 3/06 • • using perforated drums in which the article or material is placed
  - 3/08 • • the liquid having chemical or dissolving effect (substances used, see the relevant classes)
  - 3/10 • • with additional treatment of the liquid or of the object being cleaned, e.g. by heat, by electricity, by vibration

- 3/12 • • • by sonic or ultrasonic vibrations (washing or rinsing machines for crockery or tableware using sonic or ultrasonic waves A47L 15/13; of natural teeth, of prostheses using ultrasonic techniques similar to those used for natural teeth A61C 17/20; application of ultrasonic vibrations to chemical, physical, or physico-chemical processes in general B01J 19/10) [2, 5]
- 3/14 • • • Removing waste, e.g. labels, from cleaning liquid (treatment of water in general C02F) [5]
- 5/00 Cleaning by methods involving the use of air flow or gas flow** (B08B 6/00, B08B 9/00 take precedence) [2, 7]
- 5/02 • Cleaning by the force of jets, e.g. blowing-out cavities
- 5/04 • Cleaning by suction, with or without auxiliary action (suction cleaners A47L)
- 6/00 Cleaning by electrostatic means** (domestic cleaning implements functioning electrostatically A47L 13/40; cleaning of grooved record carriers G11B 3/58) [2]
- 7/00 Cleaning by methods not provided for in a single other subclass or a single group in this subclass**
- 7/02 • by distortion, beating, or vibration of the surface to be cleaned
- 7/04 • by a combination of operations
- 9/00 Cleaning hollow articles by methods or apparatus specially adapted thereto** (B08B 3/12, B08B 6/00 take precedence) [2]
- 9/02 • Cleaning pipes or tubes or systems of pipes or tubes (apparatus for cleaning metal pipes by chemical methods C23G 3/04) [5]
- 9/023 • • Cleaning the external surfaces [7]
- 9/027 • • Cleaning the internal surfaces; Removal of blockages [7]
- 9/032 • • • by the mechanical action of a moving fluid, e.g. by flushing (B08B 9/04 takes precedence) [7]
- 9/035 • • • • by suction [7]
- 9/04 • • • using cleaning devices introduced into and moved along the pipes [1, 7]
- 9/043 • • • • moved by externally powered mechanical linkage, e.g. pushed or drawn through the pipes [7]
- 9/045 • • • • • the cleaning devices being rotated while moved (B08B 9/047 takes precedence) [7]
- 9/047 • • • • • the cleaning devices having motors for powering cleaning tools [7]
- 9/049 • • • • having self-contained propelling means for moving the cleaning devices along the pipes [7]
- 9/051 • • • • • the cleaning devices having motors for powering cleaning tools [7]
- 9/053 • • • • moved along the pipes by a fluid, e.g. by fluid pressure or by suction [7]
- 9/055 • • • • • the cleaning devices conforming to, or being conformable to, substantially the cross-section of the pipes, e.g. pigs or moles [7]
- 9/057 • • • • • the cleaning devices being entrained discrete elements, e.g. balls, grinding elements, brushes [7]
- 9/08 • Cleaning of containers, e.g. tanks
- 9/087 • • by methods involving the use of tools, e.g. brushes, scrapers (B08B 9/20 takes precedence) [5]
- 9/093 • • by the force of jets or sprays (B08B 9/20 takes precedence) [5]
- 9/20 • • by using apparatus into or on to which containers, e.g. bottles, jars, cans, are brought [5]
- 9/22 • • • the apparatus cleaning by soaking alone [5]
- 9/24 • • • • and having conveyers [5]
- 9/26 • • • • • Rotating conveyers [5]
- 9/28 • • • the apparatus cleaning by splash, spray or jet application, with or without soaking [5]
- 9/30 • • • • and having conveyers [5]
- 9/32 • • • • • Rotating conveyers [5]
- 9/34 • • • • Arrangement of conduits or nozzles [5]
- 9/36 • • • the apparatus cleaning by using brushes [5]
- 9/38 • • • the apparatus cleaning by using scrapers, chains, grains of shot, sand or other abrasive means (abrasive blasting in general B24C) [5]
- 9/40 • • • the apparatus cleaning by burning out [5]
- 9/42 • • • the apparatus being characterised by means for conveying or carrying containers therethrough [5]
- 9/44 • • • • the means being for loading or unloading the apparatus [5]
- 9/46 • • Inspecting cleaned containers for cleanliness [5]
- 11/00 Cleaning flexible or delicate articles by methods or apparatus specially adapted thereto** (B08B 3/12, B08B 6/00 take precedence) [2]
- 11/02 • Devices for holding articles during cleaning
- 11/04 • specially adapted for plate glass, e.g. prior to manufacture of windshields (cleaning the gap between permanently secured panes E06B 3/677)
- 13/00 Accessories or details of general applicability for machines or apparatus for cleaning**
- 15/00 Preventing escape of dirt or fumes from the area where they are produced; Collecting or removing dirt or fumes from that area** (parts, details or accessories of cooking-vessels for withdrawing or condensing cooking vapours from such vessels A47J 36/38; refuse disposal B65F; devices for conducting smoke or fumes, e.g. flues, F23J 11/00; removing cooking fumes from domestic stoves or ranges F24C 15/20; air-conditioning, ventilation F24F) [5]
- 15/02 • using chambers or hoods covering the area
- 15/04 • from a small area, e.g. a tool
- 17/00 Methods preventing fouling**
- 17/02 • Preventing deposition of fouling or of dust
- 17/04 • • by using removable coverings
- 17/06 • • by giving articles subject to fouling a special shape for arrangement

**B09 DISPOSAL OF SOLID WASTE; RECLAMATION OF CONTAMINATED SOIL****B09B DISPOSAL OF SOLID WASTE [3]****Note(s)**

1. This subclass covers only single or combined, e.g. multistage, operations not fully classifiable in a single other subclass.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "disposal" means the discarding, e.g. dumping, or destroying of waste or its transformation into something useful or harmless;
  - "solid waste" includes waste which, although it has liquid content, is for practical purposes handled as solid.
3. Attention is drawn to the following places:
  - A23J 1/16.....Obtaining proteins from waste water of starch-manufacturing plants or like wastes
  - A23K 1/06.....Animal feeding-stuffs from distillers' or brewers' waste
  - A23K 1/08.....Animal feeding-stuffs from waste products of dairy plants
  - A23K 1/10.....Animal feeding-stuffs from kitchen waste
  - A43B 1/12.....Footwear made of rubber waste
  - A61L 11/00.....Disinfection or sterilisation methods specially adapted for refuse
  - A62D 3/00.....Processes for making harmful chemical substances harmless, or less harmful, by effecting a chemical change in the substances
  - B01D 53/34.....Chemical or biological purification of waste gases
  - B02C 18/00.....Disintegrating by knives or other cutting or tearing members which chop material into fragments
  - B03B 7/00.....Combinations of wet processes or apparatus with other processes or apparatus, e.g. for dressing ores or garbage
  - B03B 9/06.....General arrangement of separating plant, e.g. flow sheets, specially adapted for refuse
  - B05B 15/04.....Control of spray area of spraying plant, e.g. masking, side shields; Means for collection or re-use of excess material
  - B08B 15/00.....Preventing escape of dirt or fumes from the area where they are produced; Collecting or removing dirt or fumes from that area
  - B22F 8/00.....Manufacture of articles from scrap or waste metal particles
  - B23D 25/14.....Machines or arrangements for shearing stock while the latter is travelling otherwise than in the direction of the cut without regard to the exact dimensions of the resulting material, e.g. for cutting up scrap
  - B24B 55/12.....Devices for recovering materials resulting from grinding or polishing
  - B27B 33/20.....Edge trimming saw blades or tools combined with means to disintegrate waste
  - B29B 17/00.....Recovery of plastics or other constituents of waste material containing plastics
  - B30B 9/32.....Presses for consolidating scrap metal or for compacting used cars
  - B62D 67/00.....Systematic disassembly of vehicles for recovery of salvageable components, e.g. for recycling
  - B63B 17/06.....Refuse discharge from vessels, e.g. for ash
  - B63J 4/00.....Arrangements of installations for treating waste water or sewage on vessels
  - B65F 1/00.....Refuse receptacles
  - B65F 3/00.....Vehicles particularly adapted for collecting refuse
  - B65F 5/00.....Gathering or removal of refuse otherwise than by receptacles or vehicles
  - B65F 7/00.....Cleaning or disinfecting devices combined with refuse receptacles or refuse vehicles
  - C03C 1/00.....Ingredients generally applicable to manufacture of glasses, glazes or vitreous enamels
  - C04B 7/24.....Hydraulic cements from oil shales, residues or waste other than slag
  - C04B 11/26.....Calcium sulfate cements made from phosphogypsum or from waste, e.g. purification products of smoke
  - C04B 18/04.....Waste material or refuse used as fillers for mortars, concrete, artificial stone or the like
  - C04B 33/132.....Waste materials or refuse used as compounding ingredients for clay-ware
  - C05F.....Fertilisers from waste or refuse
  - C08B 16/00.....Regeneration of cellulose
  - C08J 9/33.....Agglomerating foam fragments, e.g. waste foam
  - C08J 11/00.....Recovery of waste materials of macromolecular substances
  - C08L 17/00.....Compositions of reclaimed rubber
  - C09K 11/01.....Recovery of luminescent materials
  - C10B 53/00.....Destructive distillation, specially adapted for particular solid raw materials or solid raw materials in special form
  - C10B 57/00.....Other processes not covered before; Features of destructive distillation processes in general
  - C10G 1/10.....Production of liquid hydrocarbon mixtures from rubber or rubber waste
  - C10G 73/23.....Recovery of used solvents
  - C10L 5/46.....Solid fuels essentially based on sewage, house or town refuse
  - C10L 5/48.....Solid fuels essentially based on industrial residues and waste materials
  - C10M 175/02.....Working-up used lubricants based on mineral oils
  - C11B 13/00.....Recovery of fats, fatty oils, or fatty acids from waste materials
  - C11D 19/00.....Recovery of glycerol from a saponification liquor
  - C12F 3/00.....Recovery of by-products
  - C12F 3/08.....Recovery of alcohol from press residues or other waste material
  - C12P 7/08.....Biochemical production of ethanol from waste

C22B 7/00.....	Working-up raw materials other than ores, e.g. scrap, to produce non-ferrous metals or compounds thereof
C22B 19/28.....	Obtaining zinc or zinc oxide from muffle furnace residues
C22B 19/30.....	Obtaining zinc or zinc oxide from metallic residues or scraps
C22B 25/06.....	Obtaining tin from scrap
C25D 13/24.....	Regeneration of process liquids used in electrophoretic coating
C25D 21/16.....	Regeneration of process solutions used in electrolytic coating
D01B.....	Mechanical treatment of natural fibrous or filamentary material to obtain fibres or filaments, e.g. for spinning
D01C 5/00.....	Carbonising rags to recover animal fibres
D01F 13/00.....	Recovery of starting material, waste material or solvents during the manufacture of artificial filaments or the like
D01G 11/00.....	Disintegrating fibre-containing articles to obtain fibres for re-use
D01H 11/00.....	Arrangements for confining or removing dust, fly, or the like
D06L 1/10.....	Regeneration of used chemical baths used for dry-cleaning or washing fibres, fabrics or the like
D21B 1/08.....	Dry treatment of waste paper or rags for making paper or for the production of cellulose
D21B 1/32.....	Defibrating waste paper
D21C 5/02.....	Processes for obtaining cellulose by working-up waste paper
D21C 11/14.....	Regeneration of pulp liquors by wet combustion
D21F 1/66.....	Re-use of pulp-water in wet end machines for making continuous webs of paper
D21H 17/01.....	Waste products added to the pulp or used in paper-impregnating material
E03F.....	Sewers, cesspools
E04F 17/10.....	Arrangements in buildings for the disposal of refuse
F23G.....	Consuming waste by combustion
F23J.....	Removal or treatment of combustion products or combustion residues
G03C 11/24.....	Removing emulsion from waste photographic material
G03G 21/10.....	Collecting or recycling waste developer used in electrography, electrophotography, magnetography
G21F 9/28.....	Treating radioactively contaminated solids
H01B 15/00.....	Apparatus or processes for salvaging material from electric cables
H01J 9/52.....	Recovery of material from discharge tubes or lamps
H01M 6/52.....	Reclaiming serviceable parts of waste cells or batteries
H01M 10/54.....	Reclaiming serviceable parts of waste accumulators.

**1/00 Dumping solid waste [3]**

**5/00 Operations not covered by a single other subclass or by a single other group in this subclass [3]**

**3/00 Destroying solid waste or transforming solid waste into something useful or harmless [3]**

**B09C RECLAMATION OF CONTAMINATED SOIL** (gatherers for removing stones or the like from the soil A01B 43/00; sterilising soil by steam A01G 11/00; separation in general B01D; cleaning beaches E01H 12/00; removing undesirable matter, e.g. rubbish, from the land E01H 15/00) **[6]**

#### Note(s)

- In this subclass, the following term is used with the meaning indicated:
    - "reclamation" means the partial or total elimination or the fixing of contaminants in soil.
  - Processes using enzymes or micro-organisms in order to:
    - liberate, separate or purify a pre-existing compound or composition, or to
    - treat textiles or clean solid surfaces of materials
- are further classified in subclass C12S.

**1/00 Reclamation of contaminated soil** (processes for making harmful chemical substances harmless or less harmful by affecting a chemical change in the substances A62D 3/00) **[6]**

**1/02** • Extraction using liquids, e.g. washing, leaching **[6]**

**1/04** • Flotation **[6]**

**1/06** • thermally (incinerators for contaminated soil F23G 7/14) **[6]**

**1/08** • chemically **[6]**

**1/10** • microbiologically or by using enzymes **[6]**

## SHAPING

### B21 MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL

#### Note(s)

1. This class does not cover:
  - combinations of operations covered by different subclasses of class B21, which are covered by subclass B23P;
  - combinations of operations covered by any particular subclass of class B21 with operations covered by other classes, e.g. with operations involving removal of material, which are also covered by subclass B23P, except that if the operations covered by the other classes are subsidiary to the operations properly covered by a single subclass of B21 the combination is classified in that subclass.
2. Processes of a kind covered by this class but applied to non-metallic materials are classified in this class if they are applicable to metal and cannot be classified fully in another class.

**B21B ROLLING OF METAL** (auxiliary operations used in connection with metal-working operations covered in B21, see B21C; bending by rolling B21D; manufacture of particular objects, e.g. screws, wheels, rings, barrels, balls, by rolling B21H; pressure welding by means of a rolling mill B23K 20/04)

#### Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "rolling" means rolling operations in which plastic deformations occur;
- "continuous process" means a process employing a mill train designed to have the workpiece enter one pair of rolls before leaving the preceding pair.

#### Subclass index

##### METAL ROLLING IN GENERAL

General methods or apparatus.....	1/00, 11/00, 13/00, 15/00
Control or handling.....	35/00, 37/00, 38/00, 39/00, 41/00
Safety, cooling, maintenance.....	28/00, 33/00, 43/00
Details of rolling mills.....	27/00, 29/00, 31/00

METAL ROLLING UNDER SPECIAL CONDITIONS.....9/00

AUXILIARY OPERATIONS PERFORMED IN CONNECTION WITH METAL ROLLING.....15/00, 45/00, 47/00

ROLLING SPECIAL ALLOYS.....3/00

##### ROLLING TO PRODUCE PARTICULAR SHAPES

###### Tubes

rolling methods.....17/00-23/00

mandrels, accessories.....25/00

Extending closed shapes.....5/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

**1/00 Metal rolling methods or mills for making semi-finished products of solid or profiled cross-section** (B21B 17/00-B21B 23/00 take precedence; with respect to composition of material to be rolled B21B 3/00; extending closed shapes of metal bands by simultaneous rolling at two or more zones B21B 5/00; metal-rolling stands as units B21B 13/00; continuous casting into moulds having walls formed by moving rolls B22D 11/06); **Sequence of operations in milling trains; Layout of rolling-mill plant, e.g. grouping of stands; Succession of passes or of sectional pass alternations**

1/02 • for rolling heavy work, e.g. ingots, slabs, billets, in which the cross-sectional form is unimportant

1/04 • • in a continuous process

1/06 • • in a non-continuous process

1/08 • for rolling work of special cross-section, e.g. angle steel (rolling metal of indefinite length in repetitive shapes specially designed for the manufacture of particular objects B21H 8/00) **[1, 2006.01]**

1/082 • • Piling sections having lateral edges specially adapted for interlocking with each other in order to build a wall **[2006.01]**

1/085 • • Rail sections **[2006.01]**

1/088 • • H- or I-sections **[2006.01]**

1/09 • • L-sections **[2006.01]**

1/092 • • T-sections **[2006.01]**

1/095 • • U- or channel sections **[2006.01]**

1/098 • • Z-sections **[2006.01]**

1/10 • • in a single two-high or universal rolling mill

1/12 • • in a continuous process

1/14	• in a non-continuous process	13/22	• for rolling metal immediately subsequent to continuous casting (methods therefor B21B 1/46; continuous casting B22D 11/00, e.g. into moulds with rolls B22D 11/06)
1/16	• for rolling wire or material of like small cross-section		
1/18	• • in a continuous process		
1/20	• • in a non-continuous process		
1/22	• for rolling bands or sheets of indefinite length (B21B 1/42 takes precedence)	15/00	<b>Arrangements for performing additional metal-working operations specially combined with or arranged in, or specially adapted for use in connection with, metal-rolling mills</b>
1/24	• • in a continuous process	15/02	• in which work is subjected to permanent internal twisting, e.g. for producing reinforcement bars for concrete
1/26	• • • by hot-rolling		
1/28	• • • by cold-rolling		
1/30	• • in a non-continuous process		
1/32	• • • in reversing mills, e.g. with intermediate storage reels for accumulating work		
1/34	• • • • by hot-rolling		
1/36	• • • • by cold-rolling		
1/38	• for rolling sheets of limited length, e.g. folded sheets, superimposed sheets (B21B 1/40 takes precedence; folding sheets before, or separating layers after, rolling B21B 47/00) [2]		
1/40	• for rolling foils which present special problems, e.g. because of thinness		
1/42	• for step-by-step or planetary rolling (making tubes by pilgrim-step rolling B21B 21/00)		
1/46	• for rolling metal immediately subsequent to continuous casting (metal-rolling stands B21B 13/22; continuous casting B22D 11/00, e.g. into moulds with rolls B22D 11/06) [3]		
3/00	<b>Rolling materials of special alloys so far as the composition of the alloy requires or permits special rolling methods or sequences</b> (altering special metallurgical properties of alloys, other than structure consolidation or mechanical properties resulting therefrom C21D, C22F)		
3/02	• Rolling special iron alloys		
5/00	<b>Extending closed shapes of metal bands by rolling</b> (manufacture of circular shapes, e.g. wheel rims, B21H 1/06)		
9/00	<b>Measures for carrying out rolling operations under special conditions, e.g. in vacuum or inert atmosphere to prevent oxidation of work; Special measures for removing fumes from rolling mills</b>		
11/00	<b>Subsidising the rolling processes by subjecting rollers or work to vibrations</b>		
13/00	<b>Metal-rolling stands, i.e. an assembly composed of a stand frame, rolls, and accessories</b> (B21B 17/00-B21B 23/00 take precedence; details, component parts, accessories, auxiliary means, procedures in connection with metal rolling, <u>see</u> the relevant groups)		
13/02	• with axes of rolls arranged horizontally		
13/04	• • Three-high arrangement		
13/06	• with axes of rolls arranged vertically		
13/08	• with differently-directed roll axes, e.g. for the so-called "universal" rolling process		
13/10	• • all axes being arranged in one plane		
13/12	• • axes being arranged in different planes		
13/14	• having counter-pressure devices acting on rolls to inhibit deflection of same under load (counter-pressure devices as such B21B 29/00)		
13/16	• with alternatively operative rolls		
13/18	• for step-by-step or planetary rolling (methods B21B 1/42; making tubes by pilgrim-step rolling B21B 21/00)		
13/20	• • for planetary rolling		
			<b><u>Rolling methods or mills specially designed for making or processing tubes</u></b>
		17/00	<b>Tube-rolling by rollers of which the axes are arranged essentially perpendicular to the axis of the work, e.g. "axial" tube-rolling</b>
		17/02	• with mandrel (B21B 17/08 takes precedence) [2]
		17/04	• • in a continuous process
		17/06	• • in a discontinuous process
		17/08	• with mandrel having one or more protrusions [2]
		17/10	• • in a continuous process
		17/12	• • in a discontinuous process
		17/14	• without mandrel
		19/00	<b>Tube-rolling by rollers arranged outside the work and having their axes not perpendicular to the axis of the work</b> (straightening by rollers B21D)
		19/02	• the axes of the rollers being arranged essentially diagonally to the axis of the work, e.g. "cross" tube-rolling
		19/04	• • Rolling basic material of solid, i.e. non-hollow, structure; Piercing
		19/06	• • Rolling hollow basic material (B21B 19/04 takes precedence; separating work from mandrel B21C 45/00)
		19/08	• • • Enlarging tube diameter
		19/10	• • • Finishing, e.g. smoothing, sizing
		19/12	• the axes of the rollers being arranged essentially parallel to the axis of the work
		19/14	• • Rolling tubes by means of additional rollers arranged inside the tubes
		19/16	• • Rolling tubes without additional rollers arranged inside the tubes
		21/00	<b>Pilgrim-step tube-rolling</b>
		21/02	• Rollers therefor
		21/04	• Pilgrim-step feeding mechanisms (B21B 21/06 takes precedence)
		21/06	• Devices for revolving work between the steps
		23/00	<b>Tube-rolling not restricted to methods provided for in only one of groups B21B 17/00-B21B 21/00, e.g. combined processes</b> (B21B 25/00 takes precedence)
		25/00	<b>Mandrels for metal tube rolling mills, e.g. mandrels of the types used in the methods covered by group B21B 17/00; Accessories or auxiliary means therefor</b>
		25/02	• Guides, supports, or abutments for mandrels, e.g. carriages; Adjusting devices for mandrels
		25/04	• Cooling or lubricating mandrels during operation [2]
		25/06	• Interchanging mandrels

- 27/00** **Rolls** (shape of working surfaces required by special processes B21B 1/00); **Lubricating, cooling or heating rolls while in use**
- 27/02 • Shape or construction of rolls (for rolling metal of indefinite length in repetitive shapes specially designed for the manufacture of particular objects B21H 8/02)
- 27/03 • • Sleeved rolls [5]
- 27/05 • • • with deflectable sleeves [5]
- 27/06 • Lubricating, cooling, or heating rolls
- 27/08 • • internally
- 27/10 • • externally
- 28/00** **Maintaining rolls or rolling equipment in effective condition** (lubricating, cooling or heating rolls while in use B21B 27/06) [2]
- 28/02 • Maintaining rolls in effective condition, e.g. reconditioning [2]
- 28/04 • • while in use, e.g. polishing [2]
- 29/00** **Counter-pressure devices acting on rolls to inhibit deflection of same under load, e.g. backing rolls**
- 31/00** **Rolling stand structures; Mounting, adjusting, or interchanging rolls, roll mountings, or stand frames**
- 31/02 • Rolling stand frames; Roll mountings
- 31/04 • • with tie rods, e.g. prestressed tie rods
- 31/06 • • Fastening stands or frames to foundation, e.g. to the sole plate (in general F16M)
- 31/07 • Adaptation of roll bearings (bearings in general F16C) [2]
- 31/08 • Interchanging rolls, roll mountings, or stand frames [2]
- 31/10 • • by horizontally displacing
- 31/12 • • by vertically displacing
- 31/14 • • by pivotally displacing
- 31/16 • Adjusting rolls (control devices B21B 37/00)
- 31/18 • • by moving rolls axially
- 31/20 • • by moving rolls perpendicularly to roll axis
- 31/22 • • • mechanically
- 31/24 • • • • by screws
- 31/26 • • • • Adjusting eccentrically-mounted roll bearings
- 31/28 • • • • by toggle-lever mechanisms
- 31/30 • • • • by wedges or their equivalent
- 31/32 • • • by liquid pressure
- 33/00** **Safety devices not otherwise provided for** (safety devices in general F16P); **Breaker blocks; Devices for freeing jammed rolls** [2]
- 33/02 • Preventing fracture of rolls [2]
- 35/00** **Drives for metal-rolling mills**
- 35/02 • for continuously-operating mills (B21B 35/10, B21B 35/12 take precedence)
- 35/04 • • each stand having its own motor or motors
- 35/06 • for non-continuously-operating mills or for single stands (B21B 35/10, B21B 35/12 take precedence)
- 35/08 • • for reversing rolling mills
- 35/10 • Driving arrangements for rolls which have only a low-power drive; Driving arrangements for rolls which receive power from the shaft of another roll [2]
- 35/12 • Toothed-wheel gearings specially adapted for metal-rolling mills; Housings or mountings therefor
- 35/14 • Couplings, driving spindles, or spindle carriers specially adapted for or specially arranged in metal-rolling mills (couplings or shafts in general F16)

- 37/00** **Control devices or methods specially adapted for metal-rolling mills or the work produced thereby** (methods or devices for measuring specially adapted for metal-rolling mills B21B 38/00)
- 37/16 • Control of thickness, width, diameter or other transverse dimensions (B21B 37/58 takes precedence) [6]
- 37/18 • • Automatic gauge control [6]
- 37/20 • • • in tandem mills [6]
- 37/22 • • Lateral spread control; Width control, e.g. by edge rolling [6]
- 37/24 • • Automatic variation of thickness according to a predetermined programme [6]
- 37/26 • • • for obtaining one strip having successive lengths of different constant thickness [6]
- 37/28 • Control of flatness or profile during rolling of strip, sheets or plates [6]
- 37/30 • • using roll camber control [6]
- 37/32 • • • by cooling, heating or lubricating the rolls [6]
- 37/34 • • • by hydraulic expansion of the rolls [6]
- 37/36 • • • by radial displacement of the roll sleeve on a stationary roll beam by means of hydraulic supports [6]
- 37/38 • • using roll bending (B21B 37/42 takes precedence) [6]
- 37/40 • • using axial shifting of the rolls (B21B 37/42 takes precedence) [6]
- 37/42 • • using a combination of roll bending and axial shifting of the rolls [6]
- 37/44 • • using heating, lubricating or water-spray cooling of the product [6]
- 37/46 • Roll speed or drive motor control (B21B 37/52, B21B 37/60 take precedence) [6]
- 37/48 • Tension control; Compression control [6]
- 37/50 • • by looper control [6]
- 37/52 • • by drive motor control [6]
- 37/54 • • • including coiler drive control, e.g. reversing mills [6]
- 37/56 • Elongation control [6]
- 37/58 • Roll-force control; Roll-gap control [6]
- 37/60 • • by control of a motor which drives an adjusting screw [6]
- 37/62 • • by control of a hydraulic adjusting device [6]
- 37/64 • • Mill spring or roll spring compensation systems, e.g. control of prestressed mill stands [6]
- 37/66 • • Roll eccentricity compensation systems [6]
- 37/68 • Camber or steering control for strip, sheets or plates, e.g. preventing meandering [6]
- 37/70 • Length control (B21B 37/56 takes precedence) [6]
- 37/72 • Rear end control; Front end control [6]
- 37/74 • Temperature control, e.g. by cooling or heating the rolls or the product (B21B 37/32, B21B 37/44 take precedence) [6]
- 37/76 • • Cooling control on the run-out table [6]
- 37/78 • Control of tube rolling [6]
- 38/00** **Methods or devices for measuring specially adapted for metal-rolling mills, e.g. position detection, inspection of the product** [6]
- 38/02 • for measuring flatness or profile of strips [6]
- 38/04 • for measuring thickness, width, diameter or other transverse dimensions of the product [6]
- 38/06 • for measuring tension or compression [6]
- 38/08 • for measuring roll-force [6]
- 38/10 • for measuring roll-gap, e.g. pass indicators [6]
- 38/12 • for measuring roll camber [6]



<b>39/00</b>	<b>Arrangements for moving, supporting, or positioning work, or controlling its movement, combined with or arranged in, or specially adapted for use in connection with, metal-rolling mills</b> (guiding, conveying, or accumulating easily-flexible work in loops or curves B21B 41/00; specially associated with cooling-beds B21B 43/00; conveying or transporting in general B65G)	<b>41/00</b>	<b>Guiding, conveying, or accumulating easily-flexible work, e.g. wire, sheet metal bands, in loops or curves; Loop lifters</b>
39/02	• Feeding or supporting work; Braking or tensioning arrangements	41/02	• Returning work to repeat the pass or passes
39/04	• • Lifting or lowering work for conveying purposes, e.g. tilting tables arranged immediately in front of or behind the pass (turn-over or like manipulating means as such B21B 39/20)	41/04	• • above or underneath the rolling stand or rolls
39/06	• • Pushing or forcing work into pass	41/06	• in which the direction of movement of the work is turned through approximately 180°
39/08	• • Braking or tensioning arrangements	41/08	• without overall change in the general direction of movement of the work
39/10	• • Arrangement or installation of feeding rollers in rolling stands	41/10	• • Loop deflectors
39/12	• • Arrangement or installation of roller tables in relation to a roll stand	41/12	• Arrangements of interest only with respect to provision for indicating or controlling operations
39/14	• Guiding, positioning or aligning work (B21B 43/12 takes precedence; guides in which work is subjected to permanent internal twisting B21B 15/02)	<b>43/00</b>	<b>Cooling beds, whether stationary or moving; Means specially associated with cooling beds, e.g. for braking work or for transferring it to or from the bed</b> (conveying means in general B65G)
39/16	• • immediately before entering or after leaving the pass	43/02	• Cooling beds comprising rakes or bars (B21B 43/10 takes precedence) [2]
39/18	• • Switches for directing work in metal-rolling mills or trains	43/04	• Cooling beds comprising rolls or worms
39/20	• Revolving, turning-over, or like manipulation of work (guides in which work is subjected to permanent internal twisting B21B 15/02)	43/06	• Cooling beds comprising carriages (B21B 43/08 takes precedence)
39/22	• • by tipping, e.g. by lifting one side by levers or wedges (B21B 39/26, B21B 39/28 take precedence)	43/08	• Cooling beds comprising revolving drums or recycling chains
39/24	• • by tongs or grippers	43/10	• Cooling beds with other work-shifting elements projecting through the bed
39/26	• • by members, e.g. grooved, engaging opposite sides of the work and moved relatively to each other to revolve the work	43/12	• Devices for positioning workpieces "flushed", i.e. with all their axial ends arranged in line on cooling beds or on co-operating conveyers [2]
39/28	• • by means of guide members shaped to revolve the work during its passage	<b>45/00</b>	<b>Devices for surface treatment of work, specially combined with or arranged in, or specially adapted for use in connection with, metal-rolling mills</b> (B21B 15/00 takes precedence; technical features of scaling-off devices B21C 43/00)
39/30	• • by lodging it in a rotating ring manipulator or ring segment manipulator	45/02	• for lubricating, cooling, or cleaning
39/32	• • Devices specially adapted for turning sheets	45/04	• for de-scaling
39/34	• Arrangements or constructional combinations specifically designed to perform functions covered by more than one of groups B21B 39/02, B21B 39/14, B21B 39/20	45/06	• • of strip material (B21B 45/08 takes precedence)
		45/08	• • hydraulically
		<b>47/00</b>	<b>Auxiliary arrangements, devices or methods in connection with rolling of multi-layer sheets of metal</b> (soaking pits C21D 9/70) [2]
		47/02	• for folding sheets before rolling
		47/04	• for separating layers after rolling
		<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>

**B21C MANUFACTURE OF METAL SHEETS, WIRE, RODS, TUBES, PROFILES OR LIKE SEMI-MANUFACTURED PRODUCTS OTHERWISE THAN BY ROLLING; AUXILIARY OPERATIONS USED IN CONNECTION WITH METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL**

**Subclass index**

METAL DRAWING	
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Equipment.....	3/00, 19/00
METAL EXTRUDING	
General methods.....	23/00
Auxiliary operations.....	29/00, 33/00, 35/00
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# AUXILIARY OPERATIONS USED IN CONNECTION WITH METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL

Reeling.....	47/00
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## Metal drawing

- 1/00 Manufacture of metal sheets, wire, rods, tubes or like semi-manufactured products by drawing**
- 1/02 • Drawing metal wire or like flexible metallic material by drawing machines or apparatus in which the drawing action is effected by drums
- 1/04 • • with two or more dies operating in series
- 1/06 • • • in which the material slips on the drums
- 1/08 • • • in which the material does not slip on the drums
- 1/10 • • • • with accumulation of material between consecutively-arranged dies
- 1/12 • • Regulating or controlling speed of drawing drums, e.g. to influence tension; Drives; Stop or relief mechanisms (couplings for drums B21C 1/14; design or construction of electrical equipment, see the relevant classes)
- 1/14 • • Drums, e.g. capstans (capstans or winches in general B66D); Connection of grippers thereto; Grippers specially adapted for drawing machines or apparatus of the drum type; Couplings specially adapted for these drums
- 1/16 • Metal drawing by machines or apparatus in which the drawing action is effected by means other than drums, e.g. by a longitudinally-moved carriage pulling or pushing the work or stock for making metal sheets, rods or tubes
- 1/18 • • from stock of limited length (B21C 1/22 takes precedence)
- 1/20 • • from stock of essentially unlimited length (B21C 1/22 takes precedence)
- 1/22 • • specially adapted for making tubular articles (bending sheet metal into tubular form by drawing B21D 5/10)
- 1/24 • • • by means of mandrels (mandrels B21C 3/16)
- 1/26 • • • • Push-bench drawing
- 1/27 • • Carriages; Drives
- 1/28 • • • Carriages; Connections of grippers thereto; Grippers (for drawing machines of the drum type B21C 1/14)
- 1/30 • • • Drives, e.g. carriage-traversing mechanisms; Driving elements, e.g. drawing chains; Controlling the drive
- 1/32 • • Feeding or discharging the material or mandrels
- 1/34 • • Guiding or supporting the material or mandrels
- 3/00 Profiling tools for metal drawing; Combinations of dies and mandrels for metal drawing**
- 3/02 • Dies; Selection of material therefor; Cleaning thereof
- 3/04 • • with non-adjustable section (B21C 3/08 takes precedence)
- 3/06 • • with adjustable section (B21C 3/08 takes precedence)
- 3/08 • • with section defined by rollers, balls, or the like
- 3/10 • • with hydraulic forces acting immediately on work
- 3/12 • • Die holders; Rotating dies

- 3/14 • • • Die holders combined with devices for guiding the drawing material or combined with devices for cooling, heating, or lubricating
- 3/16 • Mandrels (separating mandrels from work B21C 45/00); Mounting or adjusting same
- 3/18 • Making tools by operations not covered by a single other subclass; Repairing
- 5/00 Pointing or push-pointing drawn work or drawing material**
- 9/00 Cooling, heating or lubricating drawing material** (B21C 3/14 takes precedence)
- 9/02 • Selection of compositions therefor
- 19/00 Devices for straightening wire or like work combined with or specially adapted for use in connection with drawing or winding machines or apparatus**

## Metal extruding

- 23/00 Extruding metal; Impact extrusion**
- 23/01 • starting from material of particular form or shape, e.g. mechanically pre-treated (B21C 23/22 takes precedence; heat treatment or combinations thereof with mechanical treatments, see appropriate classes)
- 23/02 • Making uncoated products
- 23/03 • • by both direct and backward extrusion
- 23/04 • • by direct extrusion
- 23/06 • • • Making sheets
- 23/08 • • • Making wire, rods or tubes
- 23/10 • • • • Making finned tubes
- 23/12 • • • • Extruding bent tubes or rods
- 23/14 • • • Making other products
- 23/16 • • • • Making turbo blades or propellers
- 23/18 • • by impact extrusion [2]
- 23/20 • • by backward extrusion
- 23/21 • Presses specially adapted for extruding metal (extrusion presses in general B30B 11/22)
- 23/22 • Making metal-coated products; Making products from two or more metals
- 23/24 • • Covering indefinite lengths of metal or non-metal material with a metal coating
- 23/26 • • • Applying metal coats to cables, e.g. to insulated electric cables
- 23/28 • • • • on intermittently-operating extrusion presses
- 23/30 • • • • on continuously-operating extrusion presses
- 23/32 • Lubrication of metal being extruded or of dies, or the like, e.g. physical state of lubricant, location where lubricant is applied (chemical composition, see appropriate classes)
- 25/00 Profiling tools for metal extruding**
- 25/02 • Dies
- 25/04 • Mandrels

25/06	• Press heads, dies, or mandrels for coating work	37/14	• • Making tubes from doubled flat material
25/08	• Dies or mandrels with section variable during extruding, e. g for making tapered work; Controlling variation	37/15	• • Making tubes of special shape; Making the fittings
25/10	• Making tools by operations not covered by a single other subclass	37/16	• • • Making tubes with varying diameter in longitudinal direction
<b>26/00</b>	<b>Rams or plungers for metal extruding; Discs therefor [2]</b>	37/18	• • • • conical tubes
<b>27/00</b>	<b>Containers for metal to be extruded (B21C 29/02 takes precedence)</b>	37/20	• • • Making helical or similar guides in or on tubes without removing material, e.g. by drawing same over mandrels, by pushing same through dies
27/02	• for making coated work	37/22	• • • Making finned or ribbed tubes by fixing strip or like material to tubes (making heat exchangers B21D 53/02)
27/04	• Venting metal-container chamber	37/24	• • • • annularly-ribbed tubes
<b>29/00</b>	<b>Cooling or heating extruded work or parts of the extrusion press</b>	37/26	• • • • helically-ribbed tubes
29/02	• of containers for metal to be extruded	37/28	• • • Making tube fittings for connecting pipes, e.g. U-pieces
29/04	• of press heads, dies, or mandrels	37/29	• • • • Making branched pieces, e.g. T-pieces
<b>31/00</b>	<b>Control devices for metal extruding, e.g. for regulating the pressing speed or temperature of metal (B21C 25/08 takes precedence); Measuring devices, e.g. for temperature of metal, combined with or specially adapted for use in connection with extrusion presses (measuring devices of more general interest within subclass B21C, see group B21C 51/00)</b>	37/30	• • Finishing tubes, e.g. sizing, burnishing
<b>33/00</b>	<b>Feeding extrusion presses with metal to be extruded</b>	<b>43/00</b>	<b>Devices for cleaning metal products combined with or specially adapted for use with machines or apparatus provided for in this subclass</b>
33/02	• the metal being in liquid form	43/02	• combined with or specially adapted for use in connection with drawing or winding machines or apparatus
<b>35/00</b>	<b>Removing work or waste from extruding presses; Drawing-off extruded work (in connection with the extruding of bent tubes or rods B21C 23/12); Cleaning dies, ducts, containers, or mandrels for metal extruding [2]</b>	43/04	• • Devices for de-scaling wire or like flexible work
35/02	• Removing or drawing-off work	<b><u>Auxiliary operations used in connection with metal working without essentially removing material</u></b>	
35/03	• • Straightening the work (metal straightening in general B21D)	<b>45/00</b>	<b>Separating mandrels from work or vice versa</b>
35/04	• Cutting-off or removing waste	<b>47/00</b>	<b>Winding-up, coiling or winding-off metal wire, metal band or other flexible metal material characterised by features relevant to metal processing only (coiling wire into particular forms B21F 3/00; hot coilers in connection with heat-treatment apparatus C21D 9/68)</b>
35/06	• Cleaning dies, ducts, containers or mandrels [2]	47/02	• Winding-up or coiling
<hr/>		47/04	• • on or in reels or drums, without using a moving guide (reels or drums B21C 47/28)
<b>37/00</b>	<b>Manufacture of metal sheets, rods, wire, tubes, profiles or like semi-manufactured products, not otherwise provided for (by rolling B21B; by working or processing semi-finished sheet metal, profiles, tubes, or wire B21D, B21F; by casting B22; by material-removing machine tools B23; by welding, e.g. cladding or plating, B23K; by grinding or polishing B24; by electroforming C25D 1/00); Manufacture of tubes of special shape [2]</b>	47/06	• • • with loaded rollers, bolts, or equivalent means holding the material on the reel or drum
37/02	• of sheets	47/08	• • without making use of a reel or drum, the first turn being formed by a stationary guide
37/04	• of rods or wire	47/10	• • by means of a moving guide
37/06	• of tubes or metal hoses; Combined procedures for making tubes, e.g. for making multi-wall tubes (bending sheets for making tubes B21D 5/00; seaming by folding B21D 39/02)	47/12	• • • the guide moving parallel to the axis of the coil (B21C 47/14 takes precedence)
37/08	• • Making tubes with welded or soldered seams (involving only a soldering or welding operation B23K)	47/14	• • • by means of a rotating guide, e.g. laying the material around a stationary reel or drum
37/083	• • • Supply, or operations combined with supply, of strip material	47/16	• Unwinding or uncoiling
37/087	• • • using rods or strips of soldering material	47/18	• • from reels or drums
37/09	• • • of coated strip material	47/20	• • • the unreel material moving transversely to the tangent line of the drum, e.g. axially, radially
37/10	• • Making tubes with riveted seams	47/22	• • Unwinding coils without reels or drums
37/12	• • Making tubes or metal hoses with helically arranged seams	47/24	• Transferring coils to or from winding apparatus or to or from operative position therein; Preventing uncoiling during transfer
		47/26	• Special arrangements with regard to simultaneous or subsequent treatment of the material
		47/28	• Drums or other coil-holders (gripping means B21C 47/32)
		47/30	• • expandable or contractible
		47/32	• Tongs or gripping means specially adapted for reeling operations

## B21C

47/34	• Feeding or guiding devices not specially adapted to a particular type of apparatus		
49/00	Devices for temporarily accumulating material	99/00	Subject matter not provided for in other groups of this subclass [2009.01]
51/00	Measuring, gauging, indicating, counting, or marking devices specially adapted for use in the production or manipulation of material in accordance with subclasses B21B-B21F		
B21D	<b>WORKING OR PROCESSING OF SHEET METAL OR METAL TUBES, RODS OR PROFILES WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING</b> (operations of the kind involved in the manufacture of such products B21B, B21C; working or processing of wire B21F; cutting or severing devices or machines in general B26; presses in general B30B)		

### Note(s)

1. This subclass covers cutting or perforating of sheet metal or other stock material.
2. This subclass does not cover the working of metal foils in a manner analogous to the working of paper, which is covered by classes B26, B31.

### Subclass index

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### Straightening; Restoring form; Bending; Corrugating; Flanging

- 1/00** Straightening, restoring form or removing local distortions of sheet metal or specific articles made therefrom (B21D 3/00 takes precedence); **Stretching sheet metal combined with rolling** (working sheet metal of limited length by stretching B21D 25/00; by localised hammering B21D 31/06) [2]
- 1/02 • by rollers (B21D 1/06 takes precedence)
- 1/05 • Stretching combined with rolling [2]
- 1/06 • Removing local distortions
- 1/08 • • of hollow bodies made from sheet metal (of substantially open bodies B21D 1/10)
- 1/10 • • of specific articles made from sheet metal, e.g. mudguards
- 1/12 • Straightening vehicle body parts or bodies (B21D 1/14 takes precedence)
- 1/14 • Straightening frame structures
- 3/00** Straightening or restoring form of metal rods, metal tubes, metal profiles, or specific articles made therefrom, whether or not in combination with sheet metal parts (straightening of well casings in situ E21B)

- 3/02 • by rollers
- 3/04 • • arranged on axes skew to the path of the work
- 3/05 • • arranged on axes rectangular to the path of the work [2]
- 3/06 • • arranged inclined to a revolving flier rolling frame
- 3/08 • • which move in an orbit without rotating round the work
- 3/10 • between rams and anvils or abutments
- 3/12 • by stretching with or without twisting (by twisting only B21D 11/14)
- 3/14 • Recontouring
- 3/16 • of specific articles made from metal rods, tubes, or profiles, e.g. crankshafts, by specially-adapted methods or means
- 5/00** Bending sheet metal along straight lines, e.g. to form simple curves (B21D 11/06-B21D 11/18 take precedence; corrugating sheet metal B21D 13/00; as edge treatment B21D 19/00)
- 5/01 • between rams and anvils or abutments
- 5/02 • on press brakes without making use of clamping means

- 5/04 • on brakes making use of clamping means on one side of the work
- 5/06 • by drawing procedure making use of dies or forming-rollers, e.g. making profiles
- 5/08 • • making use of forming-rollers (B21D 5/12 takes precedence)
- 5/10 • • for making tubes
- 5/12 • • • making use of forming-rollers
- 5/14 • by passing between rollers (B21D 5/06 takes precedence)
- 5/16 • Folding; Pleating
- 7/00 Bending rods, profiles, or tubes** (B21D 11/02-B21D 11/18 take precedence; using mandrels or the like B21D 9/00)
- 7/02 • over a stationary forming member; by use of a swinging forming member or abutment [2]
- 7/022 • • over a stationary forming member only [2]
- 7/024 • • by a swinging forming member
- 7/025 • • • and pulling or pushing the ends of the work
- 7/028 • • • and altering the profile at the same time, e.g. forming bumpers
- 7/03 • • Apparatus with means to keep the profile in shape
- 7/04 • over a movably-arranged forming member (B21D 7/02 takes precedence)
- 7/06 • in press brakes or between rams and anvils or abutments; Pliers with forming dies
- 7/08 • by passing between rollers or through a curved die
- 7/10 • by abutting members and flexible bending means, e.g. with chains, ropes
- 7/12 • with programme control
- 7/14 • combined with measuring of bends or lengths
- 7/16 • Auxiliary equipment, e.g. for heating or cooling of bends
- 9/00 Bending tubes using mandrels or the like** (B21D 11/02-B21D 11/18 take precedence)
- 9/01 • the mandrel being flexible and engaging the entire tube length
- 9/03 • • and built-up from loose elements, e.g. series of balls
- 9/04 • the mandrel being rigid [2]
- 9/05 • co-operating with forming members
- 9/07 • • with one or more swinging forming members engaging tube ends only
- 9/08 • in press brakes or between rams and anvils or abutments; Pliers with forming dies
- 9/10 • by passing between rollers
- 9/12 • by pushing over a curved mandrel; by pushing through a curved die
- 9/14 • Wrinkle-bending, i.e. bending by corrugating
- 9/15 • using filling material of indefinite shape, e.g. sand, plastic material (filling of tubes with such material B21D 9/16) [2]
- 9/16 • Auxiliary equipment, e.g. machines for filling tubes with sand
- 9/18 • • for heating or cooling of bends
- 11/00 Bending not restricted to forms of material mentioned in only one of groups B21D 5/00, B21D 7/00, B21D 9/00; Bending not provided for in groups B21D 5/00-B21D 9/00 (corrugating or bending into wave form B21D 13/00, B21D 15/00; flanging B21D 19/00); Twisting [2]**
- 11/02 • Bending by stretching or pulling over a die (working sheet metal of limited length by stretching B21D 25/00)
- 11/06 • Bending into helical or spiral form; Forming a succession of return bends, e.g. serpentine form (making helically seamed tubing B21C 37/12)
- 11/07 • • Making serpentine-shaped articles by bending essentially in one plane
- 11/08 • Bending by altering the thickness of part of the cross-section of the work (B21D 11/06 takes precedence)
- 11/10 • Bending specially adapted to produce specific articles, e.g. leaf springs
- 11/12 • • the articles being reinforcements for concrete
- 11/14 • Twisting
- 11/15 • • Reinforcing rods for concrete
- 11/16 • • Crankshafts
- 11/18 • Jogging
- 11/20 • Bending sheet metal, not otherwise provided for
- 11/22 • Auxiliary equipment, e.g. positioning devices
- 13/00 Corrugating sheet metal, rods or profiles; Bending sheet metal, rods or profiles into wave form** (tubes B21D 15/00)
- 13/02 • by pressing
- 13/04 • by rolling
- 13/06 • by drawing
- 13/08 • by combined methods
- 13/10 • into a peculiar profiling shape
- 15/00 Corrugating tubes** (wrinkle-bending using mandrels or the like B21D 9/14) [2]
- 15/02 • longitudinally
- 15/03 • • by applying fluid pressure
- 15/04 • transversely, e.g. helically
- 15/06 • • annularly
- 15/10 • • by applying fluid pressure
- 15/12 • Bending tubes into wave form
- 17/00 Forming single grooves in sheet metal or tubular or hollow articles**
- 17/02 • by pressing (grooving or notching of bolts, studs, or the like B21K 1/54)
- 17/04 • by rolling
- 19/00 Flanging or other edge treatment, e.g. of tubes** (connecting by making use of folds B21D 39/00; flaring out tube ends B21D 41/02)
- 19/02 • by continuously-acting tools moving along the edge (edge-curling B21D 19/12)
- 19/04 • • shaped as rollers
- 19/06 • • • working inwardly
- 19/08 • by single or successive action of pressing tools, e.g. vice jaws
- 19/10 • • working inwardly
- 19/12 • Edge-curling
- 19/14 • • Reinforcing edges, e.g. armouring same
- 19/16 • Reverse flanging of tube ends
- 21/00 Combined processes according to methods covered by groups B21D 1/00-B21D 19/00**
- Stamping; Spinning; Deep-drawing; Working sheet metal of limited length by stretching; Punching**
- 22/00 Shaping without cutting, by stamping, spinning, or deep-drawing** (otherwise than using rigid devices or tools or yieldable or resilient pads B21D 26/00)
- 22/02 • Stamping using rigid devices or tools

## B21D

- 22/04 • • for dimpling (combined with perforating B21D 28/24)
- 22/06 • • having relatively-movable die parts
- 22/08 • • with die parts on rotating carriers
- 22/10 • Stamping using yieldable or resilient pads
- 22/12 • • using enclosed flexible chambers
- 22/14 • Spinning
- 22/16 • • over shaping mandrels or formers
- 22/18 • • using tools guided to produce the required profile
- 22/20 • Deep-drawing (special deep-drawing arrangements in, or in connection with, presses B21D 24/00)
- 22/21 • • without fixing the border of the blank [2]
- 22/22 • • with devices for holding the edge of the blanks (B21D 22/24-B21D 22/30 take precedence; shaping over a die without external former B21D 11/02)
- 22/24 • • involving two drawing operations having effects in opposite directions with respect to the blank
- 22/26 • • for making peculiarly, e.g. irregularly, shaped articles
- 22/28 • • of cylindrical articles using consecutive dies
- 22/30 • • to finish articles formed by deep-drawing
- 24/00 Special deep-drawing arrangements in, or in connection with, presses**
  - 24/02 • Die-cushions
  - 24/04 • Blank holders; Mounting means therefor
  - 24/06 • • Mechanically spring-loaded blank holders
  - 24/08 • • Pneumatically or hydraulically loaded blank holders
  - 24/10 • Devices controlling or operating blank holders independently, or in conjunction with dies
  - 24/12 • • mechanically
  - 24/14 • • pneumatically or hydraulically
  - 24/16 • Additional equipment in association with the tools, e.g. for shearing, for trimming
- 25/00 Working sheet metal of limited length by stretching, e.g. for straightening [2]**
  - 25/02 • by pulling over a die [2]
  - 25/04 • Clamping arrangements [2]
- 26/00 Shaping without cutting otherwise than using rigid devices or tools or yieldable or resilient pads, i.e. applying fluid pressure or magnetic forces (stamping using resilient pads B21D 22/10)**
  - 26/02 • by applying fluid pressure [2, 2011.01]
  - 26/021 • • Deforming sheet bodies [2011.01]
  - 26/023 • • • including an additional treatment performed by fluid pressure, e.g. perforating [2011.01]
  - 26/025 • • • Means for controlling the clamping or opening of the moulds [2011.01]
  - 26/027 • • • Means for controlling fluid parameters, e.g. pressure or temperature [2011.01]
  - 26/029 • • • Closing or sealing means [2011.01]
  - 26/031 • • • Mould construction (B21D 26/025-B21D 26/029 take precedence) [2011.01]
  - 26/033 • • Deforming tubular bodies (corrugating tubes by applying fluid pressure B21D 15/03, B21D 15/10) [2011.01]
  - 26/035 • • • including an additional treatment performed by fluid pressure, e.g. perforating [2011.01]
  - 26/037 • • • Forming branched tubes [2011.01]
  - 26/039 • • • Means for controlling the clamping or opening of the moulds [2011.01]

- 26/041 • • • Means for controlling fluid parameters, e.g. pressure or temperature [2011.01]
- 26/043 • • • Means for controlling the axial pusher [2011.01]
- 26/045 • • • Closing or sealing means [2011.01]
- 26/047 • • • Mould construction (B21D 26/037-B21D 26/045 take precedence) [2011.01]
- 26/049 • • • Deforming bodies having a closed end [2011.01]
- 26/051 • • • Deforming double-walled bodies [2011.01]
- 26/053 • • characterised by the material of the blanks [2011.01]
- 26/055 • • • Blanks having super-plastic properties [2011.01]
- 26/057 • • • Tailored blanks [2011.01]
- 26/059 • • • Layered blanks [2011.01]
- 26/06 • • by shock waves
- 26/08 • • • generated by explosives, e.g. chemical explosives
- 26/10 • • • generated by evaporation, e.g. of wire, of liquids
- 26/12 • • • initiated by spark discharge [2]
- 26/14 • applying magnetic forces
- 28/00 Shaping by press-cutting; Perforating**
  - 28/02 • Punching blanks or articles with or without obtaining scrap (cutting nails or pins from strips or sheet material B21G 3/26); Notching
  - 28/04 • • Centering the work; Positioning the tools
  - 28/06 • • Making more than one part out of the same blank; Scrapless working
  - 28/08 • • • Zig-zag sequence working
  - 28/10 • • Incompletely punching in such a manner that the parts are still coherent with the work
  - 28/12 • • Punching using rotatable carriers
  - 28/14 • • Dies (ejecting or stripping-off devices arranged in punching machines or tools B21D 45/00)
  - 28/16 • • Shoulder or burr prevention
  - 28/18 • • Yieldable, e.g. rubber, punching pads
  - 28/20 • • Applications of drives
  - 28/22 • • Notching the peripheries of circular blanks, e.g. laminations for dynamo-electric machines
  - 28/24 • Perforating, i.e. punching holes
  - 28/26 • • in sheets or flat parts
  - 28/28 • • in tubes or other hollow bodies
  - 28/30 • • in annular parts, e.g. rims
  - 28/32 • • in other articles of special shape
  - 28/34 • • Perforating tools; Die holders
  - 28/36 • • using rotatable work or tool holders

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- 31/00 Other methods for working sheet metal, metal tubes, metal profiles** (deforming one surface of tubes helically by rolling B21H 3/00; upsetting B21J 5/08; working metal by removing material therefrom B23; embossing B44B)
    - 31/02 • Stabbing or piercing, e.g. for making sieves (dimpling B21D 22/04; perforating by punching B21D 28/24)
    - 31/04 • Expanding other than provided for in groups B21D 1/00-B21D 28/00, e.g. for making expanded metal (B21D 47/00 takes precedence; enlarging tube ends B21D 41/02) [2]

- 31/06 • Deforming sheet metal, tubes or profiles by sequential impacts, e.g. hammering, beating, peen forming (forging hammers B21J 7/00)
- 33/00 Special measures in connection with working metal foils, e.g. gold foils** (cutting or perforating of metal foil analogous to paper B26)
- 35/00 Combined processes according to methods covered by groups B21D 1/00-B21D 31/00** (B21D 21/00 takes precedence)
- 37/00 Tools as parts of machines covered by this subclass** (forms or constructions of tools uniquely adapted for particular operations, see in the relevant groups for the operations)
- 37/01 • Selection of materials [2]
- 37/02 • Die constructions enabling assembly of the die parts in different ways (B21D 37/06 takes precedence)
- 37/04 • Movable or exchangeable mountings for tools
- 37/06 • • Pivotaly-arranged tools, e.g. disengageable (die sets with dies pivoted to one another B21D 37/12)
- 37/08 • Dies with different parts for several steps in a process
- 37/10 • Die sets; Pillar guides
- 37/12 • • Particular guiding equipment; Special arrangements for interconnection or cooperation of dies
- 37/14 • Particular arrangements for handling and holding in place complete dies
- 37/16 • Heating or cooling
- 37/18 • Lubricating
- 37/20 • Making tools by operations not covered a single other subclass
- 39/00 Application of procedures in order to connect objects or parts, e.g. coating with sheet metal otherwise than by plating** (riveting B21J; uniting components by forging or pressing to form integral members B21K 25/00; welding B23K; press-fitting, force-fitting, or shrinking in general B23P 11/00, B23P 19/00; by adhesives F16B 11/00); **Tube expanders**
- 39/02 • of sheet metal by folding, e.g. connecting edges of a sheet to form a cylinder
- 39/03 • of sheet metal otherwise than by folding [2]
- 39/04 • of tubes with tubes; of tubes with rods
- 39/06 • of tubes in openings, e.g. rolling-in
- 39/08 • Tube expanders
- 39/10 • • with rollers for expanding only
- 39/12 • • with rollers for expanding and flanging
- 39/14 • • with balls
- 39/16 • • with torque limiting devices
- 39/18 • • Rollers of special shape
- 39/20 • • with mandrels, e.g. expandable [2]
- 41/00 Application of procedures in order to alter the diameter of tube ends** (B21D 39/00 takes precedence)
- 41/02 • Enlarging
- 41/04 • Reducing; Closing
- 43/00 Feeding, positioning or storing devices combined with, or arranged in, or specially adapted for use in connection with, apparatus for working or processing sheet metal, metal tubes or metal profiles; Associations therewith of cutting devices** (cutting devices associated with the tool, see the relevant group for the tool)
- 43/02 • Advancing work in relation to the stroke of the die or tool
- 43/04 • • by means in mechanical engagement with the work
- 43/05 • • • specially adapted for multi-stage presses
- 43/06 • • • by positive or negative engaging parts co-operating with corresponding parts of the sheet or the like to be processed, e.g. carrier bolts or grooved section in the carriers
- 43/08 • • • by rollers
- 43/09 • • • • by one or more pairs of rollers for feeding sheet or strip material [2]
- 43/10 • • • by grippers
- 43/11 • • • • for feeding sheet or strip material [2]
- 43/12 • • • by chains or belts
- 43/13 • • • by linearly moving tables [2]
- 43/14 • • • by turning devices, e.g. turn-tables
- 43/16 • • by gravity, e.g. chutes
- 43/18 • • by means in pneumatic or magnetic engagement with the work
- 43/20 • Storage arrangements; Piling or unpling (in general B65G)
- 43/22 • • Devices for piling sheets
- 43/24 • • Devices for removing sheets from a stack
- 43/26 • Stops
- 43/28 • Associations of cutting devices therewith
- 45/00 Ejecting or stripping-off devices arranged in machines or tools dealt with in this subclass**
- 45/02 • Ejecting devices [2]
- 45/04 • • interrelated with motion of tool [2]
- 45/06 • Stripping-off devices [2]
- 45/08 • • interrelated with motion of tool [2]
- 45/10 • Combined ejecting and stripping-off devices [2]
- Processing sheet metal or metal tubes, or processing metal profiles according to any of groups B21D 1/00-B21D 45/00, in the manufacture of finished or semi-finished articles**
- 47/00 Making rigid structural elements or units, e.g. honeycomb structures**
- 47/01 • beams or pillars [2]
- 47/02 • • by expanding [2]
- 47/04 • composite sheet metal profiles
- 49/00 Sheathing or stiffening objects** (by winding wire or tape thereon B65H 54/00, B65H 81/00; specially adapted for manufacturing conductors or cables H01B 13/26)
- 51/00 Making hollow objects** (from thick-walled or non-uniform tubes B21K 21/00)
- 51/02 • characterised by the structure of the objects
- Note(s) [2009.01]**
- Making hollow objects characterised both by their structure and by their use isclassified only in group B21D 51/16.
- 51/04 • • built-up objects, e.g. objects with rigidly-attached bottom or cover
- 51/06 • • folded objects
- 51/08 • • ball-shaped objects
- 51/10 • • conically or cylindrically shaped objects
- 51/12 • • objects with corrugated walls
- 51/14 • • Flattening hollow objects for transport or storage; Re-forming same (making tubes from doubled flat material B21C 37/14)

## B21D

51/16	• characterised by the use of the objects (making heat exchangers B21D 53/02)	53/28	• • gear wheels
51/18	• • vessels, e.g. tubs, vats, tanks, sinks, or the like	53/30	• • wheel rims
51/20	• • • barrels	53/32	• • wheel covers
51/22	• • • pots, e.g. for cooking	53/34	• • brake drums
51/24	• • high-pressure containers, e.g. boilers, bottles	53/36	• clips, clamps, or like fastening or attaching devices, e.g. for electric installation
51/26	• • cans or tins; Closing same in a permanent manner (making outlet arrangements B21D 51/38; welding or soldering B23K) [2]	53/38	• locksmith's goods, e.g. handles
51/28	• • • Folding the longitudinal seam	53/40	• • hinges, e.g. door hinge plates
51/30	• • • Folding the circumferential seam	53/42	• • keys
51/32	• • • • by rolling	53/44	• fancy goods, e.g. jewellery products
51/34	• • • • by pressing	53/46	• haberdashery, e.g. buckles, combs; pronged fasteners, e.g. staples
51/36	• • collapsible or like thin-walled tubes, e.g. for toothpaste	53/48	• • buttons, e.g. press-buttons, snap fasteners
51/38	• • Making inlet or outlet arrangements of cans, tins, baths, bottles or other vessels; Making can ends; Making closures	53/50	• • metal slide-fastener parts
51/40	• • • Making outlet openings, e.g. bung holes	53/52	• • • fastener elements; Attaching such elements so far as this procedure is combined with the process for making the elements
51/42	• • • • Making or attaching spouts	53/54	• • • slides
51/44	• • • Making closures, e.g. caps (folded of thin metal foils in the way of making paper caps B31D 5/00; making closures in conjunction with applying same B67B)	53/56	• • • stops
51/46	• • • • Placing sealings or sealing material	53/58	• end-pieces for laces or ropes
51/48	• • • • Making crown caps	53/60	• cutlery wares; garden tools or the like
51/50	• • • • Making screw caps	53/62	• • spoons; table forks
51/52	• • boxes, cigarette cases, or the like	53/64	• • knives; scissors; cutting blades (B21D 53/72 takes precedence; handle portions B21D 53/70)
51/54	• • cartridge cases, e.g. for ammunition, for letter carriers in pneumatic-tube plants	53/66	• • spades; shovels (handle portions B21D 53/70)
53/00	<b>Making other particular articles</b> (making wire fabrics B21F; making chains or chain parts B21L)	53/68	• • rakes, garden forks, or the like (handle portions B21D 53/70)
53/02	• heat exchangers, e.g. radiators, condensers (making finned or ribbed tubes by fixing strip material or the like to tubes B21C 37/22) [2]	53/70	• • handle portions (B21D 53/72 takes precedence)
53/04	• • of sheet metal	53/72	• • sickles; scythes
53/06	• • of metal tubes	53/74	• frames for openings, e.g. for windows, doors, handbags
53/08	• • of both metal tubes and sheet metal (connecting tubes in openings B21D 39/06)	53/76	• writing or drawing instruments, e.g. writing pens, erasing pens
53/10	• parts of bearings; sleeves; valve seats or the like	53/78	• propeller blades; turbine blades
53/12	• • cages for bearings	53/80	• dustproof covers; safety covers
53/14	• belts, e.g. machine-gun belts	53/82	• perforated music sheets; pattern sheets, e.g. for control purposes, stencils
53/16	• rings, e.g. barrel hoops	53/84	• other parts for engines, e.g. connecting-rods
53/18	• • of hollow or C-shaped cross-section, e.g. for curtains, for eyelets	53/86	• other parts for bicycles or motorcycles
53/20	• • washers, e.g. for sealing	53/88	• other parts for vehicles, e.g. cowlings, mudguards
53/22	• • • with means for preventing rotation	53/90	• • axle-housings
53/24	• nuts or like thread-engaging members	53/92	• other parts for aircraft
53/26	• wheels or the like		
		55/00	<b>Safety devices protecting the machine or the operator, specially adapted for apparatus or machines dealt with in this subclass</b> (for presses in general B30B; safety devices in general F16P)

**B21F WORKING OR PROCESSING OF WIRE** (rolling of metal B21B; by drawing, auxiliary operations used in connection with metal-working without essentially removing material B21C; bundling articles B65B 13/00)

### Subclass index

#### WIRE WORKING CHARACTERISED BY OPERATIONS PERFORMED

Bending, straightening; coiling; twisting.....	1/00, 3/00, 7/00
Upsetting, straining.....	5/00, 9/00
Cutting, splitting, connecting.....	11/00, 13/00, 15/00
Articles jacketed or reinforced with wire.....	17/00
Coating of wire.....	19/00
Other treatments.....	99/00
Feeding wire into apparatus.....	23/00



## WIRE WORKING CHARACTERISED BY THE PARTICULAR ARTICLES PRODUCED

Barbed wire;network, fencing, wire fabrics.....	25/00, 27/00-33/00
Springs, rings.....	35/00, 37/00
other articles.....	39/00-45/00

**Wire working characterised by operations performed**

<b>1/00</b>	<b>Bending wire other than coiling; Straightening wire</b>
1/02	• Straightening
1/04	• Undulating
1/06	• Bending wire-eyes
<b>3/00</b>	<b>Coiling wire into particular forms</b>
3/02	• helically
3/027	• • with extended ends formed in a special shape, e.g. for clothes-pegs
3/04	• • externally on a mandrel or the like
3/06	• • internally on a hollow form
3/08	• to flat spiral
3/10	• to spirals other than flat, e.g. conical
3/12	• of interconnected helical springs
<b>5/00</b>	<b>Upsetting wire</b> (in the manufacture of nails or pins B21G 3/12)
<b>7/00</b>	<b>Twisting wire; Twisting wire together</b> (for connections of limited size B21F 15/04)
<b>9/00</b>	<b>Straining wire</b> (straining prestressing wires for concrete E04G 21/12; connections or attachments adapted for straining F16G 11/00)
9/02	• by tools adapted also for making connections
<b>11/00</b>	<b>Cutting wire</b> (hand-held metal-shearing or metal-cutting devices B23D 29/00; hand cutting tools with two jaws which come into abutting contact B26B 17/00)
<b>13/00</b>	<b>Splitting wire</b>
<b>15/00</b>	<b>Connecting wire to wire or other metallic material or objects; Connecting parts by means of wire</b> (tools for both straining and connecting B21F 9/00; jacketing or reinforcing B21F 17/00; manufacture of wire network B21F 27/00; in making bands B21F 43/00)
15/02	• wire with wire
15/04	• • without additional connecting elements or material, e.g. by twisting
15/06	• • with additional connecting elements or material
15/08	• • • making use of soldering or welding
15/10	• wire with sheet metal
<b>17/00</b>	<b>Jacketing or reinforcing articles with wire</b> (by winding B65H 54/00, B65H 81/00; by braiding D04C)
<b>19/00</b>	<b>Metallic coating of wire</b> (by extruding B21C 23/24; by soldering or welding, e.g. cladding or plating, B23K; by other non-mechanical means C23; electroplating C25D)
<b>23/00</b>	<b>Feeding wire in wire-working machines or apparatus</b> (applicable also to feeding rods or strips B21D 43/00)

**Wire working characterised by the particular articles produced**

<b>25/00</b>	<b>Making barbed wire</b>
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<b>27/00</b>	<b>Making wire network, i.e. wire nets</b> (meshed-ring network B21F 31/00; in making bands B21F 43/00; using looms D03D)
27/02	• without additional connecting elements or material at crossings, e.g. connected by knitting
27/04	• • Manufacturing on machines with rotating blades or formers
27/06	• • Manufacturing on twister-gear machines
27/08	• with additional connecting elements or material at crossings
27/10	• • with soldered or welded crossings
27/12	• Making special types or portions of network by methods or means specially adapted therefor
27/14	• • Specially bending or deforming free wire ends
27/16	• • for spring mattresses
27/18	• • of meshed work for filters or sieves
27/20	• • of plaster-carrying network
27/22	• • of network for wire-reinforced glass or the like
<b>29/00</b>	<b>Making fencing or like material made partly of wire</b> (B21F 25/00, B21F 27/00 take precedence) [2]
29/02	• comprising bars or the like connected by wires
<b>31/00</b>	<b>Making meshed-ring network from wire</b>
<b>33/00</b>	<b>Tools or devices specially designed for handling or processing wire fabrics or the like</b>
33/02	• Mounting of wire network on frames
33/04	• Connecting ends of helical springs for mattresses
<b>35/00</b>	<b>Making springs from wire</b> (by coiling wire B21F 3/00; making resilient rings B21F 37/02)
35/02	• Bending or deforming ends of coil springs to special shape
35/04	• Making flat springs, e.g. sinus springs
<b>37/00</b>	<b>Manufacture of rings from wire</b> (in chain making B21L; producing bead-rings or bead-cores for tyres B29D 30/48)
37/02	• or resilient rings, e.g. key-rings
37/04	• of washers (B21F 37/02 takes precedence)
<b>39/00</b>	<b>Making wheel spokes from wire</b>
<b>41/00</b>	<b>Making umbrella frames or members from wire</b>
<b>43/00</b>	<b>Making bands, e.g. bracelets, or wire</b> (making chains B21L; using looms D03D)
<b>45/00</b>	<b>Wire-working in the manufacture of other particular articles</b> (of pins, needles, nails, hairpins B21G; of chains B21L)
45/02	• of clothes hangers
45/04	• of elements, e.g. levers or links, for bottle stoppers
45/06	• of flexible shafts or hollow conduits, e.g. for Bowden mechanisms
45/08	• of loom heddles
45/10	• of cards for fabric-napping machines
45/12	• of fishing hooks
45/14	• of end-pieces for laces or ropes

## B21F

- 45/16 • of devices for fastening or securing purposes
- 45/18 • • of slide fastener elements
- 45/20 • • of spring hooks; of spring safety hooks
- 45/22 • • of paper fasteners or clips (staples B21F 45/24)
- 45/24 • • of staples; of belt-fastening elements
- 45/26 • • of buttons

- 45/28 • • • of "patent-fastener" or press-button type

**99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

## B21G MAKING NEEDLES, PINS, OR NAILS

**1/00 Making needles used for performing operations** (forming heads on pin-like needles B21G 3/12; making U-shaped hairpins B21G 7/04)

### Note(s)

Group B21G 1/12 takes precedence over groups B21G 1/02-B21G 1/10.

- 1/02 • of needles with eyes, e.g. sewing-needles, sewing-awls
- 1/04 • • of needles specially adapted for use in machines or tools
- 1/06 • of needles with hook or barb, e.g. crochet hooks
- 1/08 • of hollow needles or needles with hollow end, e.g. hypodermic needles, larding-needles (B21G 1/10 takes precedence)
- 1/10 • equipped with locking means for the material to be drawn through, e.g. for repairing tubeless tyres
- 1/12 • Securing, cleaning-off burrs, reconditioning, polishing, grinding
- 3/00 Making pins, nails, or the like** (of pins with individual caps B21G 5/00; of U-like shape B21G 7/00; of split-pins B21G 7/08) [2]
- 3/02 • of pins of the kind used in the tailoring trade or the household
- 3/04 • • with locking or shielding device for the pin point, e.g. safety-pins
- 3/06 • of nails with shoulders
- 3/08 • of nails with head and two or more shanks or split shanks

- 3/10 • of undulated nails or pins
- 3/12 • Upsetting; Forming heads
- 3/14 • Reducing diameter of parts otherwise than by rolling
- 3/16 • Pointing, with or without cutting
- 3/18 • by operations not restricted to one of the groups B21G 3/12-B21G 3/16 (B21G 3/06-B21G 3/10 take precedence)
- 3/20 • • from wire of indefinite length (by rolling B21G 3/30)
- 3/22 • • • in pairs arranged head to head
- 3/24 • • • by simultaneously forming the head of one nail and the adjacent point of another
- 3/26 • • by cutting from strip or sheet material
- 3/28 • • by forging or pressing
- 3/30 • • by rolling
- 3/32 • Feeding material to be worked to nail or pin making machines

**5/00 Making pins or nails with attached caps or with coated heads**

- 5/02 • of drawing-pins or pins of drawing-pin type

**7/00 Making pins of U-like shape or split-pins** (of paper fasteners or staples B21D 53/46, B21F 45/16)

- 7/02 • of U-like shape
- 7/04 • • of hairpins
- 7/06 • • • of undulated hairpins
- 7/08 • of split-pins, e.g. cotter-pins

## B21H MAKING PARTICULAR METAL OBJECTS BY ROLLING, e.g. SCREWS, WHEELS, RINGS, BARRELS, BALLS (essentially from sheet metal B21D)

### Note(s)

This subclass covers only rolling operations which are specially adapted for use in the manufacture of particular objects and which are not essentially combined with any different metal-working operation unless the latter is a subsidiary operation performed in the same machine.

**1/00 Making articles shaped as bodies of revolution** (rolling tubes B21B 17/00-B21B 25/00)

- 1/02 • discs; disc wheels
- 1/04 • • with rim, e.g. railway wheels
- 1/06 • rings of restricted axial length (extending closed shapes of metal bands by simultaneous rolling at two or more zones B21B 5/00)
- 1/08 • • railway wheel rims
- 1/10 • • rims for pneumatic tyres
- 1/12 • • rings for ball or roller bearings
- 1/14 • balls, rollers, cone rollers, or like bodies
- 1/16 • • for bearings
- 1/18 • cylinders, e.g. rolled transversely
- 1/20 • • rolled longitudinally

- 1/22 • characterised by use of rolls having circumferentially varying profile [2]

**3/00 Making helical bodies or bodies having parts of helical shape** (helical gears B21H 5/00; bending strip or the like helically B21D 11/06; forming tubes or tube walls into helical shape B21D 15/04)

- 3/02 • external screw-threads
- 3/04 • • Making by means of profiled rolls
- 3/06 • • Making by means of profiled members other than rolls, e.g. jaws, moved longitudinally or curvilinearly with respect to each other
- 3/08 • internal screw-threads
- 3/10 • twist-drills; screw-taps
- 3/12 • articles with helicoidal surface

5/00	<b>Making gear wheels</b>	7/14	• knurled articles
5/02	• with cylindrical outline	7/16	• turbine blades; compressor blades; propeller blades
5/04	• bevel gears	7/18	• grooved pins; Rolling grooves, e.g. oil grooves, in articles
7/00	<b>Making articles not provided for in groups B21H 1/00-B21H 5/00, e.g. agricultural tools, dinner forks, knives, spoons (nails, pins B21G 3/30)</b>	8/00	<b>Rolling metal of indefinite length in repetitive shapes specially designed for the manufacture of particular objects</b>
7/02	• spades; shovels	8/02	• Rolls of special shape
7/04	• hoes	9/00	<b>Feeding arrangements for rolling machines or apparatus manufacturing articles dealt with in this subclass</b>
7/06	• ploughshares; axes	9/02	• for screw-rolling machines
7/08	• forks; rakes		
7/10	• knives; sickles; scythes		
7/12	• horse-shoes; articles of like shape, e.g. wear-resisting attachments for shoes		

**B21J FORGING; HAMMERING; PRESSING; RIVETING; FORGE FURNACES** (rolling of metal B21B; making particular products by forging or pressing B21K; cladding or plating B23K; finishing surfaces by hammering B23P 9/04; compacting surfaces by blasting with particulate material B24C 1/10; general features of presses, presses for consolidating scrap B30B; furnaces in general F27)

#### Subclass index

PREPARING METAL STOCK.....	1/00
FORGING; HAMMERING; PRESSING	
General methods, equipment therefor.....	5/00
Machines, presses, hammers.....	7/00-13/00
Lubrication.....	3/00
Furnaces.....	17/00
RIVETING.....	15/00
OTHER BLACKSMITHS' REQUISITES.....	19/00

1/00	<b>Preparing metal stock</b>	7/08	• • • with rigidly-guided hammer
1/02	• Preliminary treatment of metal stock without particular shaping, e.g. salvaging segregated zones, forging or pressing in the rough (modifying the physical properties by deformation C21D 7/00, C22F 1/00)	7/10	• • with both drive and hammer connected to a fulcrumed lever, e.g. tail hammers
1/04	• Shaping in the rough solely by forging or pressing	7/12	• • • the lever being a spring, i.e. spring hammers
1/06	• Heating or cooling methods or arrangements specially adapted for performing forging or pressing operations	7/14	• • Forging machines working with several hammers
3/00	<b>Lubricating during forging or pressing</b> (lubricating in general F16N)	7/16	• • • in rotary arrangements
5/00	<b>Methods for forging, hammering, or pressing</b> (for working sheet metal or metal tubes, rods, or profiles B21D; for working wire B21F); <b>Special equipment or accessories therefor</b>	7/18	• • Forging machines working with die jaws, e.g. pivoted, movable laterally of the forging or pressing direction, e.g. for swaging
5/02	• Die forging; Trimming by making use of special dies	7/20	• Drives for hammers; Transmission means therefor
5/04	• by directly applied fluid pressure or explosive action	7/22	• • for power hammers
5/06	• for performing particular operations	7/24	• • • operated by steam, air, or other gaseous pressure
5/08	• • Upsetting	7/26	• • • operated by internal combustion
5/10	• • Piercing billets (in combination with extrusion B21C 23/00)	7/28	• • • operated by hydraulic or liquid pressure
5/12	• • Forming profiles on internal or external surfaces (making screw-thread by forging, pressing, or hammering B21K)	7/30	• • • operated by electro-magnets
7/00	<b>Hammers; Forging machines with hammers or die jaws acting by impact</b> (hand hammers B25D; electrical features section H)	7/32	• • • operated by rotary drive, e.g. electric motor
7/02	• Special design or construction	7/34	• • • operating both the hammer and the anvil, so-called counter-tup
7/04	• • Power hammers	7/36	• • for drop hammers
7/06	• • Drop hammers	7/38	• • • driven by steam, air, or other gaseous pressure
		7/40	• • • driven by hydraulic or liquid pressure
		7/42	• • • operated by rotary drive, e.g. electric motors
		7/44	• • • • equipped with belts, ropes, cables, chains
		7/46	• • Control devices specially adapted to forging hammers, not restricted to one of the preceding subgroups
		9/00	<b>Forging presses</b>
		9/02	• Special design or construction
		9/04	• • Piercing presses
		9/06	• • Sawing presses; Upsetting presses

## B21J

9/08	<ul style="list-style-type: none"><li>• • • equipped with devices for heating the workpiece (electric heating elements H05B)</li></ul>	15/16	<ul style="list-style-type: none"><li>• • Drives for riveting machines; Transmission means therefor</li></ul>
9/10	<ul style="list-style-type: none"><li>• Drives for forging presses</li></ul>	15/18	<ul style="list-style-type: none"><li>• • • operated by air pressure or other gas pressure, e.g. explosion pressure</li></ul>
9/12	<ul style="list-style-type: none"><li>• • operated by hydraulic or liquid pressure</li></ul>	15/20	<ul style="list-style-type: none"><li>• • • operated by hydraulic or liquid pressure</li></ul>
9/14	<ul style="list-style-type: none"><li>• • • in conjunction with electric power</li></ul>	15/22	<ul style="list-style-type: none"><li>• • • operated by both hydraulic or liquid pressure and gas pressure</li></ul>
9/16	<ul style="list-style-type: none"><li>• • • in conjunction with steam or gas power</li></ul>	15/24	<ul style="list-style-type: none"><li>• • • operated by electro-magnets</li></ul>
9/18	<ul style="list-style-type: none"><li>• • operated by making use of gearing mechanisms, e.g. levers, spindles, crankshafts, eccentrics, toggle-levers, rack bars</li></ul>	15/26	<ul style="list-style-type: none"><li>• • • operated by rotary drive, e.g. by electric motor</li></ul>
9/20	<ul style="list-style-type: none"><li>• • Control devices specially adapted to forging presses not restricted to one of the preceding subgroups</li></ul>	15/28	<ul style="list-style-type: none"><li>• • Control devices specially adapted to riveting machines not restricted to one of the preceding subgroups</li></ul>
11/00	<b>Forging hammers combined with forging presses; Forging machines with provision for hammering and pressing</b>	15/30	<ul style="list-style-type: none"><li>• • Particular elements, e.g. supports; Suspension equipment specially adapted for portable riveters</li></ul>
13/00	<b>Details of machines for forging, pressing, or hammering</b>	15/32	<ul style="list-style-type: none"><li>• • • Devices for inserting or holding rivets in position with or without feeding arrangements</li></ul>
13/02	<ul style="list-style-type: none"><li>• Dies or mountings therefor [2]</li></ul>	15/34	<ul style="list-style-type: none"><li>• • • • for installing tubular rivets</li></ul>
13/03	<ul style="list-style-type: none"><li>• • Die mountings [2]</li></ul>	15/36	<ul style="list-style-type: none"><li>• • Rivet sets, i.e. tools for forming heads; Mandrels for expanding parts of hollow rivets</li></ul>
13/04	<ul style="list-style-type: none"><li>• Frames; Guides</li></ul>	15/38	<ul style="list-style-type: none"><li>• Accessories for use in connection with riveting, e.g. pliers for upsetting; Hand tools for riveting</li></ul>
13/06	<ul style="list-style-type: none"><li>• Hammer tups; Anvils; Anvil blocks</li></ul>	15/40	<ul style="list-style-type: none"><li>• • for forming rivet heads</li></ul>
13/08	<ul style="list-style-type: none"><li>• Accessories for handling work or tools</li></ul>	15/42	<ul style="list-style-type: none"><li>• • Special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes</li></ul>
13/10	<ul style="list-style-type: none"><li>• • Manipulators (in general B25J)</li></ul>	15/44	<ul style="list-style-type: none"><li>• • Rivet hole positioners</li></ul>
13/12	<ul style="list-style-type: none"><li>• • • Turning means</li></ul>	15/46	<ul style="list-style-type: none"><li>• • Positioners for rivets for making tube joints</li></ul>
13/14	<ul style="list-style-type: none"><li>• • Ejecting devices</li></ul>	15/48	<ul style="list-style-type: none"><li>• • Devices for caulking rivets</li></ul>
15/00	<b>Riveting</b>	15/50	<ul style="list-style-type: none"><li>• • Removing or cutting devices for rivets</li></ul>
15/02	<ul style="list-style-type: none"><li>• Riveting procedures</li></ul>	17/00	<b>Forge furnaces</b> (furnaces for heat treatment C21D 9/00; furnaces in general F27)
15/04	<ul style="list-style-type: none"><li>• • Riveting hollow rivets mechanically</li></ul>	17/02	<ul style="list-style-type: none"><li>• electrically heated (electric heating elements H05B)</li></ul>
15/06	<ul style="list-style-type: none"><li>• • Riveting hollow rivets by means of hydraulic, liquid, or gas pressure</li></ul>	19/00	<b>Blacksmiths' requisites not otherwise provided for</b>
15/08	<ul style="list-style-type: none"><li>• • Riveting by applying heat to the end parts of the rivets to enable heads to be formed</li></ul>	19/02	<ul style="list-style-type: none"><li>• Hearths; Air supply arrangements specially adapted therefor</li></ul>
15/10	<ul style="list-style-type: none"><li>• Riveting machines (electric heating elements H05B)</li></ul>	19/04	<ul style="list-style-type: none"><li>• Anvils; Associated items</li></ul>
15/12	<ul style="list-style-type: none"><li>• • with tools or tool parts having a movement additional to the feed movement, e.g. spin</li></ul>		
15/14	<ul style="list-style-type: none"><li>• • specially adapted for riveting specific articles, e.g. brake lining machines</li></ul>		

**B21K MAKING FORGED OR PRESSED PRODUCTS, e.g. HORSE-SHOES, RIVETS, BOLTS, WHEELS** (making particular articles by working sheet metal without essentially removing material B21D; processing wire B21F; making pins, needles or nails B21G; making particular articles by rolling B21H; forging machines, pressing machines, hammering machines, in general B21J; making chains B21L; plating B23K)

### Note(s)

This subclass covers only forging, pressing, or hammering operations which are specially adapted for use in the manufacture of particular objects and which are not essentially combined with any different metal-working operation unless the latter is a subsidiary operation performed in the same machine.

### Subclass index

MAKING MACHINE ELEMENTS OR TOOLS.....	1/00, 3/00, 5/00, 19/00
MAKING RAILS.....	7/00, 9/00
MAKING LOCKSMITHS' OR BLACKSMITHS' GOODS.....	13/00, 15/00
MAKING OTHER ARTICLES.....	7/00, 11/00, 17/00, 21/00, 23/00
UNITING OF COMPONENTS.....	25/00
ACCESSORIES, AUXILIARY DEVICES.....	27/00, 29/00, 31/00

**Making particular articles by forging, pressing, or hammering; Equipment therefor**

**1/00 Making machine elements**

- 1/02 • balls, rolls, or rollers, e.g. for bearings
- 1/04 • ball-races
- 1/05 • cages for bearings [2]
- 1/06 • axles or shafts
- 1/08 • • crankshafts
- 1/10 • • of cylindrical form
- 1/12 • • of specially-shaped cross-section
- 1/14 • fittings
- 1/16 • • parts of pipe or hose couplings
- 1/18 • pistons or plungers
- 1/20 • valve parts
- 1/22 • • poppet valves, e.g. for internal-combustion engines
- 1/24 • • valve bodies; valve seats
- 1/26 • housings or supporting parts, e.g. axle housings, engine mountings
- 1/28 • wheels; discs
- 1/30 • • with gear-teeth
- 1/32 • • discs, e.g. disc wheels
- 1/34 • • wheels with spokes
- 1/36 • • with blades
- 1/38 • • rims; tyres
- 1/40 • • hubs
- 1/42 • • pulleys, e.g. cable pulleys
- 1/44 • bolts, studs, or the like (making screw-thread B21K 1/56; making U-bolts B21K 1/74)
- 1/46 • • with heads
- 1/48 • • • Machines working with hammers, e.g. beating in a radial direction, for forming heads
- 1/50 • • • Trimming or shearing formed heads, e.g. working with dies
- 1/52 • • double-ended, e.g. with heads on both ends (forming heads B21K 1/46)
- 1/54 • • with grooves or notches
- 1/56 • screw-threaded elements [2]
- 1/58 • rivets
- 1/60 • • hollow or semi-hollow rivets
- 1/62 • • special rivets, e.g. with electrical contacts
- 1/64 • nuts (making screw-thread B21K 1/56)
- 1/66 • • from strip bars
- 1/68 • • from round or profiled bars
- 1/70 • • of special shape, e.g. self-locking nuts, wing nuts
- 1/72 • hooks, e.g. crane hooks, railway track spikes (making nails in general B21G)
- 1/74 • forked members or members with two or more limbs, e.g. U-bolts, anchors
- 1/76 • elements not mentioned in one of the preceding groups

**3/00 Making engine or like machine parts not covered by B21K 1/00; Making propellers or the like**

- 3/02 • cylinder heads
- 3/04 • blades, e.g. for turbines; Upsetting of blade roots

**5/00 Making tools or tool parts, e.g. pliers**

- 5/02 • drilling-tools or other tools for making or working on holes
- 5/04 • • twisting-tools, e.g. drills, reamers
- 5/06 • • Dressing, e.g. sharpening rock drills
- 5/08 • • drifting tools
- 5/10 • • Forming drill-bit shanks

- 5/12 • other cutting tools (cutlery wares B21K 11/00)
- 5/14 • hand hammers
- 5/16 • tools for turning nuts
- 5/18 • handles or parts therefor
- 5/20 • Making working faces of dies, either recessed or outstanding

**7/00 Making railway appurtenances; Making vehicle parts**

- 7/02 • parts for permanent way (spikes B21K 1/72)
- 7/04 • • switch tongues
- 7/06 • • sleepers
- 7/08 • • base plates for rails, e.g. chairs
- 7/10 • • rail joints
- 7/12 • parts for locomotives or vehicles, e.g. frames, underframes
- 7/14 • • brake rigging or brake parts [2]

**9/00 Reconditioning railroad accessories, e.g. rails**

**11/00 Making cutlery wares; Making garden tools or the like**

- 11/02 • knives
- 11/04 • spoons; table forks
- 11/06 • scissors
- 11/08 • sickles; scythes
- 11/10 • axes; picks
- 11/12 • spades; shovels
- 11/14 • rakes; garden forks

**13/00 Making locksmiths' goods, e.g. handles for cases**

- 13/02 • hinges

**15/00 Making blacksmiths' goods**

- 15/02 • horse-shoes; accessories therefor
- 15/04 • • caulks
- 15/06 • metal attachments for footwear, e.g. wear-resisting plates

**17/00 Making sport articles, e.g. skates**

**19/00 Making articles for agricultural machinery**

- 19/02 • plough blades; ploughshares

**21/00 Making hollow articles not covered by any single one of groups B21K 1/00-B21K 19/00 (essentially from sheet-metal or uniform thin-walled tubes B21D, e.g. B21D 41/00, B21D 51/00)**

- 21/02 • Producing blanks in the shape of discs or cups as semi-finished articles for making hollow articles, e.g. to be deep-drawn or extruded
- 21/04 • Shaping thin-walled hollow articles, e.g. cartridges
- 21/06 • Shaping thick-walled hollow articles, e.g. projectiles
- 21/08 • Shaping hollow articles with different cross-section in longitudinal direction, e.g. nozzles, spark-plugs
- 21/10 • • cone-shaped or bell-shaped articles, e.g. insulator caps
- 21/12 • Shaping end portions of hollow articles
- 21/14 • • closed or substantially-closed ends, e.g. cartridge bottoms
- 21/16 • Remodelling hollow bodies with respect to the shape of the cross-section (remodelling end portions only B21K 21/12)

**23/00 Making other articles**

- 23/02 • members of endless tracks, e.g. track guides, shoes (making from sheet-metal B21D)

## B21K

- 23/04 • flanged articles (B21K 1/28 takes precedence; flanging tubes B21D)
- 25/00 **Uniting components to form integral members, e.g. turbine wheels and shafts, caulks with inserts, with or without shaping of the components** (uniting by interference- or press-fitting B23P 11/02, B23P 19/02)

### Accessories; Auxiliary devices

- 27/00 **Handling devices, e.g. for feeding, aligning, discharging; Cutting-off means; Arrangement thereof**

## B21L MAKING CHAINS (making chains or chain links by casting B22D 25/02; chains in general F16G)

### Subclass index

#### GENERAL METHODS OF WORKING

Chains made from individual links.....	1/00, 3/00, 7/00, 9/00
Chains with integral links.....	5/00
METHODS FOR MAKING SPECIAL CHAINS OR PARTS THEREOF.....	11/00, 13/00
TOOLS FOR MANUFACTURE OR REPAIR.....	19/00, 21/00
FINISHING.....	15/00
OTHER MANUFACTURE.....	99/00

#### 1/00 **Making chains or chain links by bending workpieces of rod, wire, or strip to form links of oval or other simple shape** (B21L 3/00, B21L 7/00 take precedence)

- 1/02 • by bending the ends of the workpieces to abut
- 1/04 • by bending and interconnecting the ends of the workpieces with or without separate jointing members

#### 3/00 **Making chains or chain links by bending the chain links or link parts and subsequently welding or soldering the abutting ends** (B21L 7/00 takes precedence)

- 3/02 • Machines or devices for welding chain links
- 3/04 • • by making use of forge or pressure welding

#### 5/00 **Making chains or chain links by working the starting material in such a way that integral, i.e. jointless, chain links are formed**

- 5/02 • in such a way that interconnected links are formed

#### 7/00 **Making chains or chain links by cutting single loops or loop-parts from coils, assembling the cut parts and subsequently subjecting same to twisting with or without welding**

#### 9/00 **Making chains or chain links, the links being composed of two or more different parts, e.g. drive chains** (B21L 1/04, B21L 7/00, B21L 11/14, B21L 13/00 take precedence)

- 9/02 • of roller-chain or other plate-link type
- 9/04 • • Punching or bending the different parts of the chain links
- 9/06 • • Sorting, feeding, assembling, riveting, or finishing parts of chains
- 9/08 • • Combining the chain links with auxiliary parts, e.g. welding-on wear-resistant parts

- 27/02 • Feeding devices for rods, wire, or strips
- 27/04 • • allowing successive working steps
- 27/06 • Cutting-off means; Arrangement thereof

#### 29/00 **Arrangements for heating or cooling during processing** (for preparing metal stock to be forged or pressed B21J 1/06; heating equipment in general, see the appropriate subclasses, e.g. H05B)

#### 31/00 **Control devices specially adapted for positioning tool carriers**

#### 11/00 **Making chains or chain links of special shape**

- 11/02 • each link being formed of a single member of which both ends are bent or shaped to engage the middle portion of the next link
- 11/04 • • the ends being pierced or punched to form eyes
- 11/06 • • • the workpiece being of thin strip metal
- 11/08 • • the ends being interengaged with other parts of the same link
- 11/10 • the chain links having opposed correspondingly shaped cylindrical and hook-like parts of which one part forms a hinge-like support for the adjacent link (B21L 11/02 takes precedence)
- 11/12 • Forming bead chains
- 11/14 • Making chain links with inserted or integrally-formed studs

#### 13/00 **Making terminal or intermediate chain links of special shape; Making couplings for chains, e.g. swivels, shackles**

- 15/00 **Finishing or dressing chains or chain links, e.g. removing burr material, calibrating** (B21L 9/06 takes precedence)
- 15/02 • Twisting already closed links

#### 19/00 **Appurtenances for chain-making not restricted to any particular process**

#### 21/00 **Tools or implements for repairing chains using metal-working operations, e.g. for detaching deformed chain links**

#### 99/00 **Subject matter not provided for in other groups of this subclass [2009.01]**

## B22 CASTING; POWDER METALLURGY

### B22C FOUNDRY MOULDING (moulding refractory materials in general B28B)

#### Note(s)

This subclass covers:

- the making of moulds for casting metals or of other refractory moulds;
- selection or preparation of materials therefor;
- the necessary patterns, processes, machines, accessory devices or tools.

#### Subclass index

PATTERNS, MANUFACTURE THEREOF.....	7/00, 3/00
MOULDS, CORES, GENERAL MOULDING PROCESSES; COMPOSITIONS FOR MOULDS AND CORES.....	9/00, 1/00, 3/00
MOULDING MACHINES, PROCESSES INVOLVING THESE MACHINES.....	11/00-19/00
MOULDING PLANTS.....	25/00
TOOLS OR OTHER DEVICES.....	5/00, 21/00, 23/00

<b>1/00</b>	<b>Compositions of refractory mould or core materials; Grain structures thereof</b> (refractory materials in general C04B 35/00); <b>Chemical or physical features in the formation or manufacture of moulds</b>	5/14	• Equipment for storing or handling the dressed mould material, forming part of a plant for preparing such material
1/02	• characterised by additives for special purposes, e.g. indicators, breakdown additives	5/16	• • with conveyers or other equipment for feeding the material
1/04	• • for protection of the casting, e.g. against decarbonisation	5/18	• Plants for preparing mould materials
1/06	• • • for casting extremely oxidisable metals	<b>7/00</b>	<b>Patterns; Manufacture thereof so far as not provided for in other classes</b>
1/08	• • for decreasing shrinkage of the mould, e.g. for investment casting	7/02	• Lost patterns
1/10	• • for influencing the hardening tendency of the mould material (influencing the hardening tendency of the binding agent only B22C 1/16)	7/04	• Pattern plates
1/12	• • for manufacturing permanent moulds or cores	7/05	• • for vacuum-sealed moulding [6]
1/14	• • for separating the pattern from the mould	7/06	• Core boxes
1/16	• characterised by the use of binding agents; Mixtures of binding agents	<b>9/00</b>	<b>Moulds or cores</b> (uniquely adapted to particular casting processes B22D); <b>Moulding processes</b> (processes involving the use of particular moulding machines, <u>see</u> the relevant groups for these machines)
1/18	• • of inorganic agents	9/02	• Sand moulds or like moulds for shaped castings
1/20	• • of organic agents	9/03	• • formed by vacuum-sealed moulding [6]
1/22	• • • of resins or rosins	9/04	• • Use of lost patterns
1/24	• • • of oily or fatty substances; of distillation residues therefrom	9/06	• Permanent moulds for shaped castings (moulds for ingots B22D 7/06)
1/26	• • • of carbohydrates; of distillation residues therefrom	9/08	• Features with respect to supply of molten metal, e.g. ingates, circular gates, skim gates
<b>3/00</b>	<b>Selection of compositions for coating the surfaces of moulds, cores, or patterns</b>	9/10	• Cores; Manufacture or installation of cores
3/02	• specially adapted for vacuum-sealed moulding [6]	9/11	• • for vacuum-sealed moulding [6]
<b>5/00</b>	<b>Machines or devices specially designed for dressing or handling the mould material so far as specially adapted for that purpose</b> (of general applicability, <u>see</u> the relevant places, e.g. for material with water-setting properties B28C)	9/12	• Treating moulds or cores, e.g. drying, hardening
5/02	• Dressing by centrifuging essentially or additionally	9/14	• • Equipment or plant specially adapted for drying moulds or cores (B22C 13/08 takes precedence)
5/04	• by grinding, blending, mixing, kneading, or stirring	9/16	• • • Movable drying equipment
5/06	• by sieving or magnetic separating	9/18	• Finishing
5/08	• by sprinkling, cooling, or drying	9/20	• Stack moulds, i.e. arrangement of multiple moulds or flasks
5/10	• by dust separating	9/22	• Moulds for peculiarly-shaped castings
5/12	• for filling flasks (in combination with compacting B22C 15/20-B22C 15/28)	9/24	• • for hollow articles
5/13	• • during vacuum-sealed moulding [6]	9/26	• • • for ribbed tubes; for radiators
		9/28	• • for wheels, rolls, or rollers
		9/30	• • for chains

**Moulding machines for making moulds or cores****11/00 Moulding machines for making moulds or cores, characterised by the relative arrangement of their parts**

- 11/02 • Machines in which the moulds are moved during a cycle of successive operations
- 11/04 • • by a horizontal rotary table or carrier
- 11/06 • • by a vertical rotary carrier
- 11/08 • • by non-rotary conveying means, e.g. by travelling platforms
- 11/10 • with one or more flasks forming part of the machine, from which only the sand moulds made by compacting are removed
- 11/12 • Moulding machines able to travel

**13/00 Moulding machines for making moulds or cores of particular shapes**

- 13/02 • equipped with templates, e.g. for sweeping operation
- 13/04 • • with rotary templates, e.g. arranged on a pillar
- 13/06 • • with non-rotary template and rotary flask
- 13/08 • for shell moulds or shell cores
- 13/10 • for pipes or elongated hollow articles
- 13/12 • for cores
- 13/14 • • by sweeping, turning, or coating
- 13/16 • • by pressing through a die

**15/00 Moulding machines for making moulds or cores, characterised by the compacting mechanism; Accessories therefor**

- 15/02 • Compacting by pressing devices only
- 15/04 • • involving muscle power, e.g. hand-operated levers
- 15/06 • • involving mechanical gearings, e.g. crank gears (B22C 15/04 takes precedence)
- 15/08 • • involving pneumatic or hydraulic mechanisms
- 15/10 • Compacting by jarring devices only
- 15/12 • • involving mechanical gearings
- 15/14 • • involving pneumatic or hydraulic mechanisms
- 15/16 • • • the machine having special provision for reducing shock to its frame
- 15/18 • • • • by means of separate shock-absorbers
- 15/20 • Compacting by centrifugal forces only, e.g. in sand slingers
- 15/23 • Compacting by gas pressure or vacuum [6]
- 15/24 • • involving blowing devices in which the mould material is supplied in the form of loose particles
- 15/26 • • involving propulsion devices in which the mould material is supplied in the shape of a compacted column or the like
- 15/264 • • Compacting after charge of the mould material [6]
- 15/268 • • • involving explosive combustion [6]
- 15/272 • • • involving the storage of gas under pressure [6]

- 15/276 • • • by vacuum, e.g. vacuum-sealed moulding processes [6]
- 15/28 • Compacting by different means acting simultaneously or successively, e.g. preliminary blowing and finally pressing
- 15/30 • • by both pressing and jarring devices
- 15/32 • • • involving mechanical gearing only
- 15/34 • • • involving pneumatic or hydraulic mechanisms only

**17/00 Moulding machines for making moulds or cores, characterised by the mechanism for separating the pattern from the mould or for turning over the flask or the pattern plate**

- 17/02 • Moulding machines with pin lifting arrangement
- 17/04 • Drop-plate moulding machines
- 17/06 • Moulding machines using stripping plates; Stripping plates
- 17/08 • Moulding machines with mechanisms to turn over the pattern plate or the mould around a horizontal axis
- 17/10 • • Turning-over pattern plate and flask only (B22C 17/14 takes precedence)
- 17/12 • • Turning-over pattern plate, flask, and compacting device as a unit (B22C 17/14 takes precedence)
- 17/14 • • arranged to one side of the mould table, so-called roll-over table moulding machines

**19/00 Components or accessories for moulding machines for making moulds or cores**

- 19/01 • Devices for applying sealing coating [6]
- 19/02 • Mould tables
- 19/04 • Controlling devices specially designed for moulding machines
- 19/06 • Devices for rapping or loosening the pattern

**21/00 Flasks; Accessories therefor (stripping plates B22C 17/06)**

- 21/01 • for vacuum-sealed moulding [6]
- 21/02 • Sectional flasks, i.e. with divided, articulated, or interchangeable side sections
- 21/04 • Upset frames; Bottom boards or mould boards (pattern plates B22C 7/04)
- 21/06 • • Bottom boards or mould boards
- 21/08 • Clamping equipment
- 21/10 • Guiding equipment
- 21/12 • Accessories
- 21/14 • • for reinforcing or securing moulding materials or cores, e.g. gagers, chaplets, pins, bars

**23/00 Tools; Devices not mentioned before for moulding**

- 23/02 • Devices for coating moulds or cores

**25/00 Foundry moulding plants (for preparing mould materials B22C 5/18; in combination with casting plants B22D 47/02)**

**B22D CASTING OF METALS; CASTING OF OTHER SUBSTANCES BY THE SAME PROCESSES OR DEVICES** (shaping of plastics or substances in a plastic state B29C; metallurgical processing, selection of substances to be added to metal C21, C22)

**Note(s)**

In this subclass, any material to be cast is referred to as metal.

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INDICATING OR MEASURING.....2/00



## GENERAL CASTING PROCESSES; EQUIPMENT THEREFOR

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## CASTING CHARACTERISED BY THE PRODUCTS

Pig casting.....	3/00, 5/00
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Continuous casting.....	11/00
Casting in, on, or around objects.....	19/00
Casting for other specified purposes.....	25/00

## CASTING PARTICULAR METALS.....21/00

## AFTER-TREATMENTS

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For other purposes.....	45/00

## CONTROLLING OR SUPERVISING.....46/00

## CASTING PLANTS.....47/00

**1/00 Treatment of fused masses in the ladle or the supply runners before casting** (features relating to gas injection, provided on closures of the sliding-gate type B22D 41/42, provided on pouring-nozzles B22D 41/58)

**2/00 Arrangement of indicating or measuring devices, e.g. for temperature or viscosity of the fused mass [3]**

**Casting of pigs, i.e. metal castings suitable for subsequent melting; Similar casting**

**3/00 Pig or like casting** (equipment for conveying molten metal B22D 35/00)

3/02 • Moulding of beds

**5/00 Machines or plants for pig or like casting**

5/02 • with rotary casting tables

5/04 • with endless casting conveyers

**Casting of ingots, i.e. metal castings suitable for subsequent rolling or forging**

**7/00 Casting ingots** (equipment for conveying molten metal B22D 35/00)

7/02 • Casting compound ingots of two or more different metals in the molten state, i.e. integrally cast

7/04 • Casting hollow ingots

7/06 • Ingot moulds or their manufacture

7/08 • • Divided ingot moulds

7/10 • • Hot tops therefor

7/12 • Accessories, e.g. for sintering, for preventing splashing

**9/00 Machines or plants for casting ingots**

**Particular casting processes; Machines or apparatus therefor**

**11/00 Continuous casting of metals, i.e. casting in indefinite lengths** (metal drawing, metal extruding B21C)

11/01 • without moulds, e.g. on molten surfaces [2]

11/04 • into open-ended moulds (B22D 11/06, B22D 11/07 take precedence; plants for continuous casting, e.g. for upwardly drawing the strand, B22D 11/14) [3]

11/041 • • for vertical casting (B22D 11/043, B22D 11/049-B22D 11/059 take precedence) [7]

11/043 • • Curved moulds (B22D 11/049-B22D 11/059 take precedence) [7]

11/045 • • for horizontal casting (B22D 11/049-B22D 11/059 take precedence) [7]

11/047 • • • Means for joining tundish to mould [7]

11/049 • • for direct chill casting, e.g. electromagnetic casting [7]

11/05 • • into moulds having adjustable walls [7]

11/051 • • into moulds having oscillating walls [7]

11/053 • • Means for oscillating the moulds [7]

11/055 • • Cooling the moulds [7]

11/057 • • Manufacturing or calibrating the moulds [7]

11/059 • • Mould materials or platings [7]

11/06 • into moulds with travelling walls, e.g. with rolls, plates, belts, caterpillars (B22D 11/07 takes precedence) [3]

11/07 • Lubricating the moulds [3]

11/08 • Accessories for starting the casting procedure

11/10 • Supplying or treating molten metal (B22D 41/00 takes precedence) [1, 7]

11/103 • • Distributing the molten metal, e.g. using runners, floats, distributors [7]

11/106 • • Shielding the molten jet [7]

11/108 • • Feeding additives, powders, or the like [7]

11/11 • • Treating the molten metal [7]

11/111 • • • by using protecting powders [7]

11/112 • • • by accelerated cooling [7]

11/113 • • • by vacuum treating [7]

11/114 • • • by using agitating or vibrating means (B22D 11/117 takes precedence) [7]

11/115 • • • • by using magnetic fields [7]

11/116 • • • Refining the metal [7]

11/117 • • • • by treating with gases (B22D 11/118, B22D 11/119 take precedence) [7]

- 11/118 • • • • by circulating the metal under, over or around weirs (B22D 11/119 takes precedence) [7]
- 11/119 • • • • by filtering [7]
- 11/12 • Accessories for subsequent treating or working cast stock in situ (rolling immediately subsequent to continuous casting B21B 1/46, B21B 13/22) [3]
- 11/124 • • for cooling [2]
- 11/126 • • for cutting [2]
- 11/128 • • for removing [2]
- 11/14 • Plants for continuous casting, e.g. for upwardly drawing the strand
- 11/16 • Controlling or regulating processes or operations [2]
- 11/18 • • for pouring (B22D 11/20 takes precedence) [4]
- 11/20 • • for removing cast stock [4]
- 11/22 • • for cooling cast stock or mould [4]
- 13/00 Centrifugal casting; Casting by using centrifugal force**
- 13/02 • of elongated solid or hollow bodies, e.g. pipes, in moulds rotating around their longitudinal axis
- 13/04 • of shallow solid or hollow bodies, e.g. wheels or rings, in moulds rotating around their axis of symmetry
- 13/06 • of solid or hollow bodies in moulds rotating around an axis arranged outside of the mould
- 13/08 • in which a stationary mould is fed from a rotating mass of liquid metal
- 13/10 • Accessories for centrifugal casting apparatus, e.g. moulds, linings therefor, means for feeding molten metal, cleansing moulds, removing castings (making or lining moulds B22C)
- 13/12 • Controlling, supervising, specially adapted to centrifugal casting, e.g. for safety reasons [3]
- 15/00 Casting using a mould or core of which a part significant to the process of high thermal conductivity, e.g. chill casting; Moulds or accessories specially adapted therefor** (continuous casting of metals into open-ended moulds for direct chill casting B22D 11/049) [1, 7]
- 15/02 • of cylinders, pistons, bearing shells or like thin-walled objects
- 15/04 • Machines or apparatus for chill casting (B22D 15/02 takes precedence)
- 17/00 Pressure die casting or injection die casting, i.e. casting in which the metal is forced into a mould under high pressure [3]**
- 17/02 • Hot chamber machines, i.e. with heated press chamber in which metal is melted
- 17/04 • • Plunger machines
- 17/06 • • Air injection machines
- 17/08 • Cold chamber machines, i.e. with unheated press chamber into which molten metal is ladled
- 17/10 • • with horizontal press motion
- 17/12 • • with vertical press motion
- 17/14 • Machines with evacuated die cavity
- 17/16 • specially adapted for casting slide fasteners or elements therefor
- 17/18 • Machines built up from units providing for different combinations
- 17/20 • Accessories; Details
- 17/22 • • Dies (manufacture, see the appropriate class, e.g. B23P 15/24); Die plates; Die supports; Cooling equipment for dies; Accessories for loosening and ejecting castings from dies
- 17/24 • • • Accessories for locating and holding cores or inserts
- 17/26 • • Mechanisms or devices for locking or opening dies
- 17/28 • • Melting pots
- 17/30 • • Accessories for supplying molten metal, e.g. in rations
- 17/32 • • Controlling equipment
- 18/00 Pressure casting; Vacuum casting** (B22D 17/00 takes precedence; treating the metal in the mould by using pressure or vacuum B22D 27/00) [3]
- 18/02 • Pressure casting making use of mechanical pressing devices, e.g. cast-forging (B22D 18/04 takes precedence) [3]
- 18/04 • Low pressure casting, i.e. making use of pressures up to a few bars to fill the mould [3]
- 18/06 • Vacuum casting, i.e. making use of vacuum to fill the mould [3]
- 18/08 • Controlling, supervising, e.g. for safety reasons [3]
- 19/00 Casting in, on, or around, objects which form part of the product** (B22D 23/04 takes precedence; aluminothermic welding B23K 23/00; coating by casting molten material on the substrate C23C 6/00)
- 19/02 • for making reinforced articles (B22D 19/14 takes precedence) [3]
- 19/04 • for joining parts
- 19/06 • for manufacturing or repairing tools
- 19/08 • for building up linings or coverings, e.g. of anti-frictional metal
- 19/10 • Repairing defective or damaged objects by metal casting techniques (by other techniques B23P 6/04)
- 19/12 • for making objects, e.g. hinges, with parts which are movable relatively to one another
- 19/14 • the objects being filamentary or particulate in form (making alloys containing fibres or filaments by contacting the fibres or filaments with molten metal C22C 47/08) [3]
- 19/16 • for making compound objects cast of two or more different metals, e.g. for making rolls for rolling mills (casting compound ingots B22D 7/02) [3]
- 21/00 Casting non-ferrous metals or metallic compounds so far as their metallurgical properties are of importance for the casting procedure** (apparatus for vacuum casting B22D 18/00); **Selection of compositions therefor**
- 21/02 • Casting exceedingly oxidisable non-ferrous metals, e.g. in inert atmosphere (use of inert atmosphere in casting metals in general B22D 23/00)
- 21/04 • • Casting aluminium or magnesium
- 21/06 • Casting non-ferrous metals with a high melting-point, e.g. metallic carbides (B22D 21/02 takes precedence)
- 23/00 Casting processes not provided for in groups B22D 1/00-B22D 21/00** (making metallic powder by casting B22F 9/08; aluminothermic welding B23K 23/00; remelting metals C22B 9/16)
- 23/02 • Top casting
- 23/04 • Casting by dipping (hot-dipping or immersion processes for applying coating material in the molten state without affecting the shape C23C 2/00)
- 23/06 • Melting-down metal, e.g. metal particles, in the mould
- 23/10 • • Electroslag casting [5]

- 25/00 Special casting characterised by the nature of the product** (B22D 15/02, B22D 17/16, B22D 19/00 take precedence; casting stereotype plates B41D 3/00) [2]
- 25/02 • by its peculiarity of shape; of works of art
- 25/04 • • Casting metal electric battery plates or the like (manufacture thereof by multi-step processes H01M 4/82) [2]
- 25/06 • by its physical properties (B22D 27/00 takes precedence)
- 25/08 • • by uniform hardness (B22D 15/00 takes precedence)
- 27/00 Treating the metal in the mould while it is molten or ductile** (B22D 7/12, B22D 11/10, B22D 18/00, B22D 43/00 take precedence) [3]
- 27/02 • Use of electric or magnetic effects
- 27/04 • Influencing the temperature of the metal, e.g. by heating or cooling the mould (cooling of open-ended moulds in continuous casting B22D 11/055) [1, 7]
- 27/06 • • Heating the top discard of ingots (hot tops for ingot moulds B22D 7/10)
- 27/08 • Shaking, vibrating, or turning of moulds (B22D 11/051, B22D 11/053 take precedence) [1, 7]
- 27/09 • by using pressure [3]
- 27/11 • • making use of mechanical pressing devices [3]
- 27/13 • • making use of gas pressure [3]
- 27/15 • by using vacuum [3]
- 27/18 • Measures for using chemical processes for influencing the surface composition of castings, e.g. for increasing resistance to acid attack
- 27/20 • Measures not previously mentioned for influencing the grain structure or texture; Selection of compositions therefor

#### **Final measures after casting**

- 29/00 Removing castings from moulds, not restricted to casting processes covered by a single main group; Removing cores; Handling ingots** [2]
- 29/02 • Vibratory apparatus specially designed for shaking out flasks
- 29/04 • Handling or stripping castings or ingots (grippers in general, see the relevant subclasses, e.g. B66C)
- 29/06 • • Strippers actuated by fluid pressure
- 29/08 • • Strippers actuated mechanically [2]
- 30/00 Cooling castings, not restricted to casting processes covered by a single main group** (accessories for cooling cast stock in continuous casting of metals B22D 11/124; controlling or regulating processes or operations for cooling cast stock or mould in continuous casting of metals B22D 11/22; chill casting B22D 15/00) [5]
- 31/00 Cutting-off surplus material after casting, e.g. gates** (cleaning of castings by sand-blasting B24C)

#### **Other equipment for casting** [3]

- 33/00 Equipment for handling moulds**
- 33/02 • Turning or transposing moulds
- 33/04 • Bringing together or separating moulds
- 33/06 • Burdening or relieving moulds

- 35/00 Equipment for conveying molten metal into beds or moulds** (B22D 37/00-B22D 41/00 take precedence; specially adapted to particular processes or machines, see the relevant groups)
- 35/02 • into beds
- 35/04 • into moulds, e.g. base plates, runners
- 35/06 • Heating or cooling equipment
- 37/00 Controlling or regulating the pouring of molten metal from a casting melt-holding vessel** (B22D 39/00, B22D 41/00 take precedence; specially adapted to particular processes or machines, see the relevant groups of this subclass) [3, 5]
- 39/00 Equipment for supplying molten metal in rations** (specially adapted to particular processes or machines, see the relevant groups of this subclass)
- 39/02 • having means for controlling the amount of molten metal by volume [3]
- 39/04 • having means for controlling the amount of molten metal by weight [3]
- 39/06 • having means for controlling the amount of molten metal by controlling the pressure above the molten metal [3]
- 41/00 Casting melt-holding vessels, e.g. ladles, tundishes, cups or the like** (B22D 39/00, B22D 43/00 take precedence) [5]
- 41/005 • with heating or cooling means [5]
- 41/01 • • Heating means [5]
- 41/015 • • • with external heating, i.e. the heat source not being a part of the ladle [5]
- 41/02 • Linings
- 41/04 • tiltable
- 41/05 • • Tea-pot spout ladles [5]
- 41/06 • Equipment for tilting
- 41/08 • for bottom pouring (B22D 41/14, B22D 41/50 take precedence)
- 41/12 • Travelling ladles or similar containers; Cars for ladles (casting cranes B66C)
- 41/13 • • Ladle turrets [7]
- 41/14 • Closures [5]
- 41/16 • • stopper-rod type, i.e. a stopper-rod being positioned downwardly through the vessel and the metal therein, for selective registry with the pouring opening [5]
- 41/18 • • • Stopper-rods therefor [5]
- 41/20 • • • Stopper-rod operating equipment [5]
- 41/22 • • sliding-gate type, i.e. having a fixed plate and a movable plate in sliding contact with each other for selective registry of their openings [5]
- 41/24 • • • characterised by a rectilinearly movable plate (B22D 41/38-B22D 41/42 take precedence) [5]
- 41/26 • • • characterised by a rotatively movable plate (B22D 41/38-B22D 41/42 take precedence) [5]
- 41/28 • • • Plates therefor (B22D 41/38-B22D 41/42 take precedence) [5]
- 41/30 • • • • Manufacturing or repairing thereof [5]
- 41/32 • • • • • characterised by the materials used therefor [5]
- 41/34 • • • • Supporting, fixing or centering means therefor [5]
- 41/36 • • • • Treating the plates, e.g. lubricating, heating (ladles, cups or the like with heating means B22D 41/01) [5]
- 41/38 • • • Means for operating the sliding gate [5]
- 41/40 • • • Means for pressing the plates together [5]

**B22D**

- 41/42 • • • Features relating to gas injection [5]
- 41/44 • • Consumable closure means, i.e. closure means being used only once [5]
- 41/46 • • • Refractory plugging masses [5]
- 41/48 • • • Melttable closures [5]
- 41/50 • Pouring-nozzles [5]
- 41/52 • • Manufacturing or repairing thereof [5]
- 41/54 • • • characterised by the materials used therefor [5]
- 41/56 • • Means for supporting, manipulating or changing a pouring-nozzle [5]
- 41/58 • • with gas injecting means [5]
- 41/60 • • with heating or cooling means [5]

- 41/62 • • with stirring or vibrating means [5]

**43/00 Mechanical cleaning, e.g. skimming of molten metals**

**45/00 Equipment for casting, not otherwise provided for**

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**46/00 Controlling, supervising, not restricted to casting covered by a single main group, e.g. for safety reasons [3]**

**47/00 Casting plants**

- 47/02 • for both moulding and casting

**B22F WORKING METALLIC POWDER; MANUFACTURE OF ARTICLES FROM METALLIC POWDER; MAKING METALLIC POWDER** (processes or devices for granulating materials in general B01J 2/00; making ceramics by compacting or sintering C04B, e.g. C04B 35/64; for the production of metals as such, see class C22; reduction or decomposition of metal compounds in general C22B; making alloys by powder metallurgy C22C; electrolytic production of metal powder C25C 5/00)

**Note(s)**

1. This subclass covers the making of metallic powder only insofar as powder with specific physical characteristics is made.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "metallic powder" covers powders containing a substantial proportion of non-metallic material;
  - "powder" includes somewhat larger particles which are worked, obtained or behave in a manner similar to powder, e.g. fibres.

**1/00 Special treatment of metallic powder, e.g. to facilitate working, to improve properties; Metallic powders per se, e.g. mixtures of particles of different composition** (C04, C08 take precedence)

- 1/02 • comprising coating of the powder [2]

**3/00 Manufacture of workpieces or articles from metallic powder characterised by the manner of compacting or sintering; Apparatus specially adapted therefor**

- 3/02 • Compacting only
- 3/03 • • Press-moulding apparatus therefor [6]
- 3/035 • • • with one or more of the parts thereof being pivotally mounted [6]
- 3/04 • • by applying fluid pressure
- 3/06 • • by centrifugal forces
- 3/08 • • by explosive forces
- 3/087 • • using high energy impulses, e.g. magnetic field impulses [6]
- 3/093 • • using vibration [6]
- 3/10 • Sintering only
- 3/105 • • by using electric current, laser radiation or plasma (B22F 3/11 takes precedence) [6]
- 3/11 • • Making porous workpieces or articles [6]
- 3/115 • by spraying molten metal, i.e. spray sintering, spray casting [6]
- 3/12 • Both compacting and sintering (by forging B22F 3/17) [6]
- 3/14 • • simultaneously
- 3/15 • • • Hot isostatic pressing [6]
- 3/16 • • in successive or repeated steps
- 3/17 • by forging [6]
- 3/18 • by using pressure rollers [6]
- 3/20 • by extruding
- 3/22 • for producing castings from a slip
- 3/23 • involving a self-propagating high-temperature synthesis or reaction sintering step [6]
- 3/24 • After-treatment of workpieces or articles
- 3/26 • • Impregnating

**5/00 Manufacture of workpieces or articles from metallic powder characterised by the special shape of the product**

- 5/02 • of piston rings
- 5/04 • of turbine blades
- 5/06 • of threaded articles, e.g. nuts
- 5/08 • of toothed articles, e.g. gear wheels; of cam discs
- 5/10 • of articles with cavities or holes, not otherwise provided for in the preceding subgroups [6]
- 5/12 • of tubes or wires [6]

**7/00 Manufacture of composite layers, workpieces, or articles, comprising metallic powder, by sintering the powder, with or without compacting**

- 7/02 • of composite layers
- 7/04 • • with one or more layers not made from powder, e.g. made from solid metal
- 7/06 • of composite workpieces or articles from parts, e.g. to form tipped tools
- 7/08 • • with one or more parts not made from powder

**8/00 Manufacture of articles from scrap or waste metal particles [6]**

**9/00 Making metallic powder or suspensions thereof**

- 9/02 • using physical processes [3]
- 9/04 • • starting from solid material, e.g. by crushing, grinding or milling (crushing, grinding or milling, in general, see the relevant subclasses, e.g. B02C) [3]
- 9/06 • • starting from liquid material [3]
- 9/08 • • • by casting, e.g. through sieves or in water, by atomising or spraying (using electric discharge B22F 9/14) [3]
- 9/10 • • • • using centrifugal force [3]
- 9/12 • • starting from gaseous material [3]
- 9/14 • • using electric discharge [3]
- 9/16 • using chemical processes [3]
- 9/18 • • with reduction of metal compounds [3]

9/20 • • • starting from solid metal compounds [3]  
 9/22 • • • using gaseous reductors [3]  
 9/24 • • • starting from liquid metal compounds, e.g.  
 solutions [3]

9/26 • • • using gaseous reductors [3]  
 9/28 • • • starting from gaseous metal compounds [3]  
 9/30 • • with decomposition of metal compounds, e.g. by  
 pyrolysis [3]

## B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

### Note(s)

- This class covers:
  - operations not provided for in any other class;
  - combinations of operations covered by different subclasses of classes B21-B24, which combinations are covered by subclass B23P, with the exception of subsidiary operations performed in conjunction with main operations covered by a single subclass;
  - features, specific to machine tools, which relate to a requirement or problem of a nature which is not peculiar to a particular kind of machine tool, e.g. feeding work, which are covered by subclass B23Q, although the realisation of these features may differ according to the kind of machine tool concerned. The said subclass covers such features, in general, even if the feature or a specific function, in any particular case, is to some extent peculiar to, or is claimed only for, machine tools designed for one particular operation; only in exceptional cases are such features classified in the subclass for the machine tool concerned. Certain features of this general nature are, however, referred to subclasses relating to particular metal-working operations, especially B23B, in which case the subclasses in question are not restricted, in respect of those features, to the kind of machine tool with which they are primarily concerned.
- In this class, the following terms or expressions are used with the meanings indicated:
  - "metal-working" covers the working of other materials unless the context requires otherwise;
  - "kind of operations" and similar expressions relate to such metal-working operations as boring, drilling, milling and grinding;
  - "kind of machine" means a machine designed for a particular kind of metal-working operation (e.g. a lathe);
  - "form of machine" means a machine of a particular kind adapted or arranged for a particular way of working or for particular work, e.g. face-plate lathe, tailstock lathe, turret lathe;
  - "different machines" covers different forms of machines for performing the same type of metal-working operation, e.g. vertical and horizontal boring machines.
- If details, components, or accessories have no essential feature specific to machine tools, the more general class, e.g. F16, takes precedence.

**B23B TURNING; BORING** (using an electrode which takes the place of a tool B23H, e.g. making holes B23H 9/14; working by laser beam B23K 26/00; arrangements for copying or controlling B23Q)

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**Turning****1/00 Methods for turning or working essentially requiring the use of turning-machines; Use of auxiliary equipment in connection with such methods****3/00 General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines**

- 3/02 • Small lathes, e.g. for toolmakers (specially designed for watchmakers G04D 3/00)
- 3/04 • Turning-machines in which the workpiece is rotated by means at a distance from the headstock
- 3/06 • Turning-machines or devices characterised only by the special arrangement of constructional units (B23Q 37/00 takes precedence; structural features of details, *see* the relevant groups; such features of general applicability B23Q)
- 3/08 • Turning-machines characterised by the use of faceplates
- 3/10 • • with the faceplate horizontal, i.e. vertical boring and turning machines
- 3/12 • • with the faceplate vertical, i.e. face lathes
- 3/14 • • Mountings or drives of faceplates
- 3/16 • Turret lathes for turning individually-chucked workpieces
- 3/18 • • with horizontal working-spindle
- 3/20 • • with vertical working-spindle
- 3/22 • Turning-machines or devices with rotary tool heads
- 3/24 • • the tools of which do not perform a radial movement; Rotary tool heads therefor
- 3/26 • • the tools of which perform a radial movement; Rotary tool heads thereof
- 3/28 • Turning-machines in which the feed is controlled by a copying device, i.e. copying lathes (features of copying devices B23Q 35/00)
- 3/30 • Turning-machines with two or more working-spindles, e.g. in fixed arrangement
- 3/32 • • for performing identical operations simultaneously on two or more workpieces
- 3/34 • Short turning-machines with one or multiple working-spindles attended from the end (B23B 3/12 takes precedence)
- 3/36 • Associations of only turning-machines directed to a particular metal-working result (if the metal-working result is not essential B23Q 39/00)

**5/00 Turning-machines or devices specially adapted for particular work; Accessories specially adapted therefor**

- 5/02 • for turning hubs or brake drums (B23B 5/04 takes precedence)
- 5/04 • for reconditioning hubs or brake drums or axle spindles without removing same from the vehicle
- 5/06 • for turning valves or valve bodies
- 5/08 • for turning axles, bars, rods, tubes, rolls, i.e. shaft-turning lathes, roll lathes; Centreless turning
- 5/10 • • for turning pilgrim rolls
- 5/12 • • for peeling bars or tubes by making use of cutting bits arranged around the workpiece (making use of cutting bits arranged around the workpiece otherwise than by turning B23D 79/12) [2]
- 5/14 • Cutting-off lathes (shearing B23D)
- 5/16 • for bevelling, chamfering, or deburring the ends of bars or tubes
- 5/18 • for turning crankshafts, eccentrics, or cams, e.g. crankpin lathes

- 5/20 • • without removing same from the engine
- 5/22 • • Holding the workpiece in the machine, e.g. chucking devices
- 5/24 • for turning pistons or other workpieces to a slightly non-circular cross-section
- 5/26 • for simultaneously turning internal and external surfaces of a body
- 5/28 • for turning wheels or wheel sets or cranks thereon, i.e. wheel lathes
- 5/30 • • Arrangements providing for tool control by templates
- 5/32 • • for reconditioning wheel sets without removing same from the vehicle; Underfloor wheel lathes for railway vehicles
- 5/34 • • Holding the workpiece in the machine, e.g. chucking devices therefor; Drivers therefor
- 5/36 • for turning specially-shaped surfaces by making use of relative movement of the tool and work produced by geometrical mechanisms, i.e. forming-lathes
- 5/38 • • for turning conical surfaces inside or outside, e.g. taper pins
- 5/40 • • for turning spherical surfaces inside or outside
- 5/42 • • for turning relieving surfaces, i.e. relieving-lathes
- 5/44 • • for turning polygonal or other non-circular surfaces controlled by gear or guide mechanisms, i.e. eccentric lathes
- 5/46 • • for turning helical or spiral surfaces (thread cutting B23G)
- 5/48 • • • for cutting grooves, e.g. oil grooves of helicoidal shape

**7/00 Automatic or semi-automatic turning-machines with a single working-spindle, e.g. controlled by cams; Equipment therefor; Features common to automatic and semi-automatic turning-machines with one or more working-spindles**

- 7/02 • Automatic or semi-automatic machines for turning of stock
- 7/04 • • Turret machines
- 7/06 • • with sliding headstock
- 7/08 • • with the working-spindle vertical
- 7/10 • • Accessories, e.g. guards
- 7/12 • Automatic or semi-automatic machines for turning of workpieces
- 7/14 • • with the working-spindle horizontal
- 7/16 • • with the working-spindle vertical

**9/00 Automatic or semi-automatic turning-machines with a plurality of working-spindles, e.g. automatic multiple-spindle machines with spindles arranged in a drum carrier able to be moved into pre-determined positions; Equipment therefor (equipment applicable to single-spindle machines B23B 7/00)**

- 9/02 • Automatic or semi-automatic machines for turning of stock
- 9/04 • • with the working-spindles horizontal
- 9/06 • • with the working-spindles vertical
- 9/08 • Automatic or semi-automatic machines for turning of workpieces
- 9/10 • • with the working-spindles horizontal
- 9/12 • • with the working-spindles vertical

**11/00 Automatic or semi-automatic turning-machines incorporating equipment for performing other working procedures, e.g. slotting, milling, rolling****13/00 Arrangements for automatically conveying, chucking or guiding stock for turning machines**

- 13/02 • for turning-machines with a single working-spindle
- 13/04 • for turning-machines with a plurality of working-spindles
- 13/06 • Arrangements for switching-off the drive of turning-machines after the stock has been completely machined
- 13/08 • Arrangements for reducing vibrations in feeding-passages or for damping noise (damping noise in general G10K)
- 13/10 • with magazines for stock
- 13/12 • Accessories, e.g. stops, grippers

**15/00 Arrangements for conveying, loading, adjusting, reversing, chucking, or discharging workpieces specially designed for automatic or semi-automatic turning-machines**

**Components or accessories particularly for turning machines**

- 17/00 Lathe beds** (foundation frames, carriage guides as such B23Q 1/00)
- 19/00 Headstocks; Equivalent parts of any machine tools**
  - 19/02 • Working-spindles; Features relating thereto, e.g. supporting arrangements (B23B 13/00 takes precedence)
- 21/00 Lathe carriages; Cross-slides; Tool posts** (tool holders B23B 29/00); **Similar parts of any machine tools**
- 23/00 Tailstocks; Centres**
  - 23/02 • Dead centres
  - 23/04 • Live centres
- 25/00 Accessories or auxiliary equipment for turning-machines** (for machine tools in general B23Q; cooling or lubricating B23Q 11/12)
  - 25/02 • Arrangements for chip-breaking in turning-machines (on cutting tools B23B 27/22)
  - 25/04 • Safety guards specially designed for turning-machines (in general F16P)
  - 25/06 • Measuring, gauging, or adjusting equipment on turning-machines for setting-on, feeding, controlling, or monitoring the cutting tools or work (measuring devices or gauges G01B)

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- 27/00 Tools for turning or boring machines** (for drilling machines B23B 51/00); **Tools of a similar kind in general; Accessories therefor**
    - 27/02 • Cutting tools with straight main part and cutting edge at an angle (B23B 27/04-B23B 27/08 take precedence)
    - 27/04 • Cutting-off tools (B23B 27/08 takes precedence)
    - 27/06 • Profile cutting tools, i.e. forming-tools
    - 27/08 • Cutting tools with blade- or disc-like main parts
    - 27/10 • Cutting tools with special provision for cooling
    - 27/12 • • with a continuously-rotated circular cutting edge; Holders therefor
    - 27/14 • Cutting tools of which the bits or tips are of special material
    - 27/16 • • with exchangeable cutting bits, e.g. able to be clamped
    - 27/18 • • with cutting bits or tips rigidly mounted, e.g. by brazing
    - 27/20 • • with diamond bits
    - 27/22 • Cutting tools with chip-breaking equipment

- 27/24 • Knurling tools

**29/00 Holders for non-rotary cutting tools** (B23B 27/12 takes precedence); **Boring bars or boring heads; Accessories for tool holders**

- 29/02 • Boring bars
- 29/03 • Boring heads
- 29/034 • • with tools moving radially, e.g. for making chamfers or undercuttings [4]
- 29/04 • Tool holders for a single cutting tool
- 29/06 • • Tool holders equipped with longitudinally-arranged grooves for setting the cutting tool
- 29/08 • • Tool holders equipped with grooves arranged crosswise to the longitudinal direction for setting the cutting tool
- 29/10 • • • with adjustable counterbase for the cutting tool
- 29/12 • • Special arrangements on tool holders
- 29/14 • • • affording a yielding support of the cutting tool, e.g. by spring clamping
- 29/16 • • • for supporting the workpiece in a backrest
- 29/18 • • • for retracting the cutting tool
- 29/20 • • • for placing same by shanks in sleeves of a turret
- 29/22 • • • for tool adjustment by means of shims or spacers
- 29/24 • Tool holders for a plurality of cutting tools, e.g. turrets
- 29/26 • • Tool holders in fixed position
- 29/28 • • Turrets manually adjustable about a vertical pivot
- 29/30 • • Turrets manually adjustable about a horizontal pivot
- 29/32 • • Turrets adjustable by power drive, i.e. turret heads
- 29/34 • • Turrets equipped with triggers for releasing the cutting tools
- 31/00 Chucks; Expansion mandrels; Adaptations thereof for remote control** (devices for securing work or tools to spindles in general B23Q 3/12; rotary devices holding by magnetic or electrical force acting directly on work B23Q 3/152)
  - 31/02 • Chucks
  - 31/06 • • Features relating to the removal of tools or work; Accessories therefor
  - 31/07 • • • Ejector wedges [5]
  - 31/08 • • holding tools or work yieldably
  - 31/10 • • characterised by the retaining or gripping devices or their immediate operating means

**Note(s)**

Group B23B 31/12 takes precedence over groups B23B 31/103-B23B 31/117.

- 31/103 • • • Retention by pivotal elements, e.g. catches, pawls [5]
- 31/107 • • • Retention by laterally-acting detents, e.g. pins, screws, wedges; Retention by loose elements, e.g. balls [5]
- 31/11 • • • Retention by threaded connection [5]
- 31/113 • • • Retention by bayonet connection [5]
- 31/117 • • • Retention by friction only, e.g. using springs, resilient sleeves, tapers [5]
- 31/12 • • • Chucks with simultaneously-acting jaws, whether or not also individually adjustable
- 31/14 • • • • involving the use of centrifugal force
- 31/16 • • • • moving radially
- 31/163 • • • • • actuated by one or more spiral grooves [5]

## B23B

- 31/165 • • • • • actuated by screw-and-nut mechanisms [5]
- 31/167 • • • • • actuated by oblique racks [5]
- 31/169 • • • • • actuated by toothed gearing (B23B 31/167 takes precedence) [5]
- 31/171 • • • • • actuated by a cam surface in a radial plane [5]
- 31/173 • • • • • actuated by coaxial conical surfaces (B23B 31/177 takes precedence) [5]
- 31/175 • • • • • actuated by levers moved by a coaxial control rod [5]
- 31/177 • • • • • actuated by the oblique surfaces of a coaxial control rod (B23B 31/167 takes precedence) [5]
- 31/18 • • • • • pivotally movable in planes containing the axis of the chuck
- 31/19 • • • • • moving parallel to the axis of the chuck
- 31/20 • • • • • Longitudinally-split sleeves, e.g. collet chucks
- 31/22 • • • • • Jaws in the form of balls
- 31/24 • • characterised by features relating primarily to remote control of the gripping means
- 31/26 • • • using mechanical transmission through the working-spindle
- 31/28 • • • using electric or magnetic means in the chuck
- 31/30 • • • using fluid-pressure means in the chuck
- 31/32 • • with jaws carried by diaphragm
- 31/34 • • with means enabling the workpiece to be reversed or tilted
- 31/36 • • with means for adjusting the chuck with respect to the working-spindle
- 31/38 • • with overload clutches
- 31/39 • • Jaw changers [5]
- 31/40 • Expansion mandrels
- 31/42 • • characterised by features relating primarily to remote control of the gripping means
- 33/00 Drivers; Driving centres; Nose clutches, e.g. lathe dogs**

### Boring; Drilling [3]

- 35/00 Methods for boring or drilling, or for working essentially requiring the use of boring or drilling machines; Use of auxiliary equipment in connection with such methods**
- 37/00 Boring by making use of vibrations of ultrasonic frequency** (working materials by subjecting the grinding tools or the abrading medium to vibration, e.g. grinding with ultrasonic frequency, B24B 1/04)
- 39/00 General-purpose boring or drilling machines or devices; Sets of boring or drilling machines**
- 39/02 • Boring machines; Combined horizontal boring and milling machines
- 39/04 • Co-ordinate boring or drilling machines; Machines for making holes without previous marking
- 39/06 • • Equipment for positioning work
- 39/08 • • Devices for programme control
- 39/10 • characterised by the drive, e.g. by fluid-pressure drive, pneumatic power drive
- 39/12 • Radial drilling machines
- 39/14 • with special provision to enable the machine or the drilling or boring head to be moved into any desired position, e.g. with respect to immovable work

- 39/16 • Drilling machines with a plurality of working-spindles; Drilling automatons
- 39/18 • • Setting work or tool carrier along a straight index line
- 39/20 • • Setting work or tool carrier along a circular index line; Turret head drilling machines
- 39/22 • • with working-spindles in opposite headstocks
- 39/24 • • designed for programme control
- 39/26 • in which the working position of tool or work is controlled by copying discrete points of a pattern (features of copying devices B23Q 35/02)
- 39/28 • Associations of only boring or drilling machines directed to a particular metal-working result (if not producing a particular metal-working result B23Q 39/00)
- 41/00 Boring or drilling machines or devices specially adapted for particular work; Accessories specially adapted therefor**
- 41/02 • for boring deep holes; Trepanning, e.g. of gun or rifle barrels
- 41/04 • for boring polygonal or other non-circular holes
- 41/06 • for boring conical holes
- 41/08 • for boring, drilling, or tapping holes in tubes under fluid or gas pressure (sealing features or operations, combined with placing branch parts F16L 41/04)
- 41/10 • for boring holes in steam boilers
- 41/12 • for forming working surfaces of cylinders, of bearings, e.g. in heads of driving rods, or of other engine parts
- 41/14 • for very small holes
- 41/16 • for boring holes with high-quality surface
- 43/00 Boring or drilling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool** (if specially adapted for particular work B23B 41/00)
- 43/02 • to the tailstock of a lathe
- 45/00 Hand-held or like portable drilling machines, e.g. drill guns; Equipment therefor** (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]
- 45/02 • driven by electric power
- 45/04 • driven by fluid-pressure or pneumatic power
- 45/06 • driven by man-power
- 45/08 • • for drilling rails or profiled stock
- 45/10 • • by using a fiddle bow or a belt
- 45/12 • • by using a ratchet brace
- 45/14 • Means for holding or guiding the drilling device or for securing it to the work (B23B 41/08 takes precedence); Thrust stands
- 45/16 • with superimposed percussive action (portable percussive machines with superimposed rotation B25D 16/00) [3]

### Components or accessories for boring or drilling machines

- 47/00 Constructional features of components specially designed for boring or drilling machines; Accessories therefor** (working-spindles, bearing sleeves therefor B23B 19/02; for machine tools in general B23Q)
- 47/02 • Drives; Gearings (B23B 39/10 takes precedence)
- 47/04 • • for rotating the working-spindle
- 47/06 • • • driven essentially by electrical means



- 47/08 • • • driven essentially by fluid-pressure or pneumatic power
- 47/10 • • • • equipped with turbines or other rotating machines
- 47/12 • • • • equipped with oscillating pistons
- 47/14 • • • Change-speed gearings; Reversing gearings
- 47/16 • • • Belt or chain drives
- 47/18 • • for feeding or retracting tool or work
- 47/20 • • • actuated essentially by electric power
- 47/22 • • • actuated essentially by fluid-pressure or pneumatic power
- 47/24 • • • Stops or feed interruption owing to fracture or overload of the boring or drilling tool
- 47/26 • Lifiable or lowerable drill heads or headstocks; Balancing arrangements therefor
- 47/28 • Drill jigs for workpieces (equipment for setting or guiding the drill B23B 49/00)
- 47/30 • Additional gear with one or more working-spindles attachable to the main working-spindle and mounting the additional gear
- 47/32 • Arrangements for preventing the running-out of drills or fracture of drills when getting through
- 47/34 • Arrangements for removing chips out of the holes made; Chip-breaking arrangements attached to the tool

**49/00 Measuring or gauging equipment on boring machines for positioning or guiding the drill; Devices for indicating failure of drills during boring; Centring devices for holes to be bored** (marking-out equipment B25H 7/00; measuring devices, gauges G01B)

- 49/02 • Boring templates or bushings
- 49/04 • Devices for boring or drilling centre holes in workpieces
- 49/06 • Devices for drilling holes in brake bands or brake linings

**51/00 Tools for drilling machines**

- 51/02 • Twist drills
- 51/04 • for trepanning
- 51/05 • • for cutting discs from sheet **[4]**
- 51/06 • Drills with lubricating or cooling equipment
- 51/08 • Drills combined with tool parts or tools for performing additional working
- 51/10 • Bits for countersinking
- 51/12 • Adapters for drills or chucks; Tapered sleeves
- 51/14 • • Adapters for broken drills

**B23C MILLING** (broaching B23D; broach-milling in making gears B23F; arrangements for copying or controlling B23Q)

#### Subclass index

MILLING MACHINES IN GENERAL.....	1/00
MILLING PARTICULAR WORK.....	3/00
COMPONENT PARTS, ACCESSORIES.....	5/00, 9/00
DEVICES FOR ATTACHMENT TO ANY MACHINE.....	7/00

#### **1/00 Milling machines not designed for particular work or special operations**

- 1/02 • with one horizontal working-spindle
- 1/025 • • with working-spindle in a fixed position **[2]**
- 1/027 • • with working-spindle movable in a vertical direction **[2]**
- 1/04 • with a plurality of horizontal working-spindles
- 1/06 • with one vertical working-spindle
- 1/08 • with a plurality of vertical working-spindles
- 1/10 • with both horizontal and vertical working-spindles
- 1/12 • with spindle adjustable to different angles, e.g. either horizontally or vertically
- 1/14 • with rotary work-carrying table (work-tables for machine tools in general B23Q 1/00)
- 1/16 • specially designed for control by copying devices
- 1/18 • • for milling while revolving the work
- 1/20 • Portable devices or machines (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00); Hand-driven devices or machines **[4]**
- 3/00 Milling particular work; Special milling operations; Machines therefor** (milling gear teeth B23F; milling of threads B23G 1/32) **[2]**
- 3/02 • Milling surfaces of revolution (B23C 3/06, B23C 3/08 take precedence)
- 3/04 • • while revolving the work
- 3/05 • • Finishing valves or valve seats **[2]**

- 3/06 • Milling crankshafts
- 3/08 • Milling cams, camshafts, or the like
- 3/10 • Relieving by milling (lathes or turning devices for relieving B23B 5/42)
- 3/12 • Trimming or finishing edges, e.g. deburring welded corners
- 3/13 • Surface milling of plates, sheets or strips **[2]**
- 3/14 • Scrubbing or peeling ingots or similar workpieces
- 3/16 • Working surfaces curved in two directions
- 3/18 • • for shaping screw-propellers, turbine blades, or impellers
- 3/20 • • for shaping dies
- 3/22 • Forming overlapped joints, e.g. of the ends of piston-rings
- 3/24 • Making square or polygonal ends on workpieces, e.g. key studs on tools
- 3/26 • Making square or polygonal holes in workpieces, e.g. key holes in tools
- 3/28 • Grooving workpieces
- 3/30 • • Milling straight grooves, e.g. keyways
- 3/32 • • Milling helical grooves, e.g. in making twist-drills
- 3/34 • • Milling grooves of other forms, e.g. circumferential
- 3/35 • • Milling grooves in keys
- 3/36 • Milling milling-cutters (B23C 3/28 takes precedence)

**5/00 Milling-cutters** (for cutting gear teeth B23F 21/12)  
5/02 • characterised by the shape of the cutter

## B23C

5/04	• • Plain cutters, i.e. having essentially a cylindrical or tapered cutting surface of substantial length (B23C 5/10 takes precedence)	5/22	• • • Securing arrangements for bits or teeth
5/06	• • Face-milling cutters, i.e. having only or primarily a substantially flat cutting surface	5/24	• • • • adjustable
5/08	• • Disc-type cutters	5/26	• Securing milling-cutters to the driving spindle
5/10	• • Shank-type cutters, i.e. with an integral shaft	5/28	• Features relating to lubricating or cooling
5/12	• • Cutters specially designed for producing particular profiles (B23C 5/10 takes precedence)	7/00	<b>Milling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool</b>
5/14	• • • essentially comprising curves	7/02	• to lathes
5/16	• characterised by physical features other than shape	7/04	• to planing or slotting machines
5/18	• • with permanently-fixed cutter-bits or teeth	9/00	<b>Details or accessories so far as specially adapted to milling machines or cutters</b> (drives, control devices, or accessories, in general B23Q)
5/20	• • with removable cutter-bits or teeth		

**B23D PLANING; SLOTTING; SHEARING; BROACHING; SAWING; FILING; SCRAPING; LIKE OPERATIONS FOR WORKING METAL BY REMOVING MATERIAL, NOT OTHERWISE PROVIDED FOR** (making toothed gears or the like B23F; cutting metal by applying heat locally B23K; arrangements for copying or controlling B23Q)

### Note(s)

This subclass covers machines for shearing sheet metal or other stock material except metal foils workable in a manner analogous to paper, which is covered by class B26.

### Subclass index

#### PLANING; SLOTTING

Working method of the machine.....	1/00, 3/00, 5/00
Machines characterised by constructional features of a part.....	7/00
Hand-operated devices; portable apparatus.....	9/00
Devices for attachment to any machine tool.....	11/00
Tools, tool holders.....	13/00

#### SHEARING

Working method of machines or apparatus.....	15/00, 17/00, 19/00, 27/00, 31/00
Hand-held devices.....	21/06, 27/02, 29/00
Tools, holders, chucks.....	35/00
Accessories.....	33/00
Machines for particular work.....	21/00, 23/00, 25/00
Control arrangements.....	36/00

#### BROACHING; REAMING

Working method of machines or apparatus.....	37/00
Machines or devices characterised by constructional features of a part.....	41/00
Tools.....	43/00, 77/00
Accessories.....	39/00
Machines or devices for reaming bored holes.....	75/00

#### SAWING

Working method of machines or apparatus	
using saw discs.....	45/00, 47/00
using straight saw blades.....	49/00, 51/00
using endless saw blades.....	53/00, 55/00
other working methods.....	57/00
Machines or devices characterised by constructional features of a part.....	47/00, 51/00, 55/00
Tools and attachment thereof; dressing thereof; making thereof.....	51/00, 61/00, 63/00, 65/00
Accessories.....	59/00
Control arrangements.....	36/00

#### FILING; RASPING

Working method of machines or apparatus.....	67/00
Machines or devices characterised by constructional features of a part.....	69/00
Tools; making thereof.....	71/00, 73/00

OTHER METHODS, MACHINES, OR DEVICES; COMBINATIONS.....	79/00, 81/00
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**Planing; Slotting**

- 1/00 Planing or slotting machines cutting by relative movement of the tool and workpiece in a horizontal straight line only**
- 1/02 • by movement of the work-support
  - 1/04 • • with the tool supported only on one side of the bed
  - 1/06 • • with the tool supported on both sides of the bed
  - 1/08 • by movement of the tool
  - 1/10 • • with means for adjusting the tool-guide vertically
  - 1/12 • • • with the tool supported only on one side of the bed
  - 1/14 • • • with the tool supported on both sides of the bed
  - 1/16 • • without means for adjusting the tool-guide vertically
  - 1/18 • cutting on both the forward and the return stroke
  - 1/20 • with tool-supports or work-supports specially mounted or guided for working in different directions or at different angles; Special purpose machines
  - 1/22 • • for planing ingots or the like (scrubbing or peeling ingots by milling B23C 3/14)
  - 1/24 • • for planing inner surfaces, e.g. of moulds
  - 1/26 • • for planing edges or ridges or cutting grooves (cutting helical grooves B23D 5/02)
  - 1/28 • • in which the tool or workpiece is fed otherwise than in a straight line, e.g. for planing profiled stock
  - 1/30 • • • in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00)
- 3/00 Planing or slotting machines cutting by relative movement of the tool and workpiece in a vertical or inclined straight line**
- 3/02 • for cutting grooves (cutting helical grooves B23D 5/02)
  - 3/04 • in which the tool or workpiece is fed otherwise than in a straight line
  - 3/06 • • in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00)
- 5/00 Planing or slotting machines cutting otherwise than by relative movement of the tool and workpiece in a straight line**
- 5/02 • involving rotary and straight-line movements only, e.g. for cutting helical grooves
  - 5/04 • controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00)
- 7/00 Planing or slotting machines characterised only by constructional features of particular parts** (constructional features of these parts per se B23Q)
- 7/02 • of frames, of work-table beds
  - 7/04 • of pillars, of cross-beams
  - 7/06 • of tool-carrying arrangements
  - 7/08 • of work-tables
  - 7/10 • of drives for reciprocating parts
  - 7/12 • of arrangements for impact damping or regenerating energy
- 9/00 Hand-operated planing devices; Portable planing apparatus** (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]

- 11/00 Planing or slotting devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool**
- 13/00 Tools or tool holders specially designed for planing or slotting machines** (features applicable also to turning-machines B23B 27/00, B23B 29/00; for cutting gear teeth B23F 21/04)
- 13/02 • Pivotaly-mounted holders
  - 13/04 • Holders for tool sets
  - 13/06 • Devices for lifting or lowering the tool

**Shearing; Similar cutting**

- 15/00 Shearing machines or shearing devices cutting by blades which move parallel to each other**
- 15/02 • having both upper and lower moving blades
  - 15/04 • having only one moving blade
  - 15/06 • Sheet shears
  - 15/08 • • with a blade moved in one plane, e.g. perpendicular to the surface of the sheet
  - 15/10 • • with a blade moved in a curved surface, e.g. for producing an edge with a curved cross-section
  - 15/12 • characterised by drives or gearings therefor
  - 15/14 • • actuated by fluid or gas pressure
- 17/00 Shearing machines or shearing devices cutting by blades pivoted on a single axis** (on an axis parallel to the blade B23D 15/10; hand-held devices B23D 29/00)
- 17/02 • characterised by drives or gearings therefor
  - 17/04 • • actuated by a rotary shaft
  - 17/06 • • actuated by fluid or gas pressure
  - 17/08 • • actuated by hand or foot operated lever mechanism
- 19/00 Shearing machines or shearing devices cutting by rotary discs** (by friction saw discs B23D 45/00)
- 19/02 • having both a fixed shearing blade and a rotary shearing disc
  - 19/04 • having rotary shearing discs arranged in co-operating pairs
  - 19/06 • • with several spaced pairs of shearing discs working simultaneously, e.g. for trimming or making strips
  - 19/08 • for special use, e.g. for cutting curves, for chamfering edges
- 21/00 Machines or devices for shearing or cutting tubes** (as additional equipment for deep-drawing presses B21D 24/16; by sawing, see the relevant groups for sawing machines or sawing devices)
- 21/02 • otherwise than in a plane perpendicular to the axis of the tube, e.g. for making mitred cuts, for making bicycle frames
  - 21/04 • Tube-severing machines with rotating tool-carrier
  - 21/06 • Hand-operated tube cutters
  - 21/08 • • with cutting wheels
  - 21/10 • • with other cutting blades or tools
  - 21/12 • • • with provision for hammering on the tool
  - 21/14 • cutting inside the tube
- 23/00 Machines or devices for shearing or cutting profiled stock** (hand-held devices B23D 29/00)
- 23/02 • otherwise than in a plane perpendicular to the axis of the stock
  - 23/04 • by means of holding-dies, arranged side by side, subjecting the stock to torsional stress

## B23D

25/00	<b>Machines or arrangements for shearing stock while the latter is travelling otherwise than in the direction of the cut</b> (control arrangements specially adapted for machines for shearing stock while the latter is travelling otherwise than in the direction of the cut B23D 36/00; controlling slack in travelling flexible stock B21C 47/10) [2]
25/02	<ul style="list-style-type: none"><li>Flying shearing machines (B23D 25/12 takes precedence; flying shears for cutting in general B26D 1/56)</li></ul>
25/04	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>in which a cutting unit moves bodily with the work while cutting (B23D 25/06 takes precedence)</li></ul></li></ul>
25/06	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>having a cutting device mounted on an oscillating lever</li></ul></li></ul>
25/08	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>having two coacting shearing blades mounted independently</li></ul></li></ul>
25/10	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>on co-operating beams moving parallel to each other and attached to lever mechanisms</li></ul></li></ul></li></ul>
25/12	<ul style="list-style-type: none"><li>Shearing machines with blades on coacting rotating drums</li></ul>
25/14	<ul style="list-style-type: none"><li>without regard to the exact dimensions of the resulting material, e.g. for cutting-up scrap</li></ul>
27/00	<b>Machines or devices for cutting by a nibbling action</b>
27/02	<ul style="list-style-type: none"><li>Hand-held devices (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]</li></ul>
27/04	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>actuated by electric power</li></ul></li></ul>
27/06	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>actuated by fluid or gas pressure</li></ul></li></ul>
29/00	<b>Hand-held metal-shearing or metal-cutting devices</b> (with nibbling action B23D 27/02; hand-operated devices for metal-cutting otherwise than by shearing B26B)
29/02	<ul style="list-style-type: none"><li>Hand-operated metal-shearing devices</li></ul>
31/00	<b>Shearing machines or shearing devices covered by none or more than one of the groups B23D 15/00-B23D 29/00; Combinations of shearing machines</b>
31/02	<ul style="list-style-type: none"><li>for performing different cutting operations on travelling stock, e.g. slitting and severing simultaneously</li></ul>
31/04	<ul style="list-style-type: none"><li>for trimming stock combined with devices for shredding scrap</li></ul>
33/00	<b>Accessories for shearing machines or shearing devices</b> (feeding stock to machines or removing stock B21D 43/00)
33/02	<ul style="list-style-type: none"><li>Arrangements for holding, guiding, or feeding work during the operation</li></ul>
33/04	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for making circular cuts</li></ul></li></ul>
33/06	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00)</li></ul></li></ul>
33/08	<ul style="list-style-type: none"><li>Press-pads; Counter-bases; Hold-down devices</li></ul>
33/10	<ul style="list-style-type: none"><li>Stops for positioning work</li></ul>
33/12	<ul style="list-style-type: none"><li>Equipment for indicating where to cut</li></ul>
35/00	<b>Tools for shearing machines or shearing devices; Holders or chucks for shearing tools</b>

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36/00	<b>Control arrangements specially adapted for machines for shearing or similar cutting, or for sawing, stock while the latter is travelling otherwise than in the direction of the cut</b> [2]
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## Broaching

37/00	<b>Broaching machines or broaching devices</b>
37/02	<ul style="list-style-type: none"><li>Broaching machines with horizontally-arranged working tools</li></ul>
37/04	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for broaching inner surfaces</li></ul></li></ul>
37/06	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for broaching outer surfaces</li></ul></li></ul>
37/08	<ul style="list-style-type: none"><li>Broaching machines with vertically-arranged working tools</li></ul>
37/10	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for broaching inner surfaces</li></ul></li></ul>
37/12	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for broaching outer surfaces</li></ul></li></ul>
37/14	<ul style="list-style-type: none"><li>Broaching machines with rotatably-arranged working tools</li></ul>
37/16	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>for broaching helical grooves</li></ul></li></ul>
37/18	<ul style="list-style-type: none"><li>Broaching machines with working tools mounted on an endless chain or belt</li></ul>
37/20	<ul style="list-style-type: none"><li>Broaching machines with arrangements for working in opposite directions</li></ul>
37/22	<ul style="list-style-type: none"><li>for special purposes (B23D 37/14 takes precedence)</li></ul>
39/00	<b>Accessories for broaching machines or broaching devices</b>
41/00	<b>Broaching machines or broaching devices characterised only by constructional features of particular parts</b> (constructional features of these parts <i>per se</i> B23Q)
41/02	<ul style="list-style-type: none"><li>of frames; of work supports</li></ul>
41/04	<ul style="list-style-type: none"><li>of tool-carrying arrangements</li></ul>
41/06	<ul style="list-style-type: none"><li>of devices for feeding, clamping, or ejecting workpieces</li></ul>
41/08	<ul style="list-style-type: none"><li>of drives; of control devices</li></ul>
43/00	<b>Broaching tools</b> (for cutting gear teeth B23F 21/26)
43/02	<ul style="list-style-type: none"><li>for cutting by rectilinear movement (B23D 43/08 takes precedence)</li></ul>
43/04	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>having inserted cutting edges</li></ul></li></ul>
43/06	<ul style="list-style-type: none"><li>for cutting by rotational movement</li></ul>
43/08	<ul style="list-style-type: none"><li>mounted on an endless chain or belt</li></ul>

## Sawing

45/00	<b>Sawing machines or sawing devices with circular saw blades or with friction saw discs</b> (shearing machines with rotary discs B23D 19/00-B23D 25/00)
45/02	<ul style="list-style-type: none"><li>with a circular saw blade or the stock mounted on a carriage</li></ul>
45/04	<ul style="list-style-type: none"><li>with a circular saw blade or the stock carried by a pivoted lever</li></ul>
45/06	<ul style="list-style-type: none"><li>with a circular saw blade arranged underneath a stationary work-table</li></ul>
45/08	<ul style="list-style-type: none"><li>with a ring blade having inside saw teeth</li></ul>
45/10	<ul style="list-style-type: none"><li>with a plurality of circular saw blades</li></ul>
45/12	<ul style="list-style-type: none"><li>with a circular saw blade for cutting tubes</li></ul>
45/14	<ul style="list-style-type: none"><li>for cutting otherwise than in a plane perpendicular to the axis of the stock, e.g. for making a mitred cut</li></ul>
45/16	<ul style="list-style-type: none"><li>Hand-held sawing devices with circular saw blades</li></ul>
45/18	<ul style="list-style-type: none"><li>Machines with circular saw blades for sawing stock while the latter is travelling otherwise than in the direction of the cut (control of such machines B23D 36/00) [2]</li></ul>
45/20	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>Flying sawing machines, the saw carrier of which is reciprocated in a guide and moves with the travelling stock during sawing</li></ul></li></ul>
45/22	<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>Flying sawing machines with lever-supported saw carrier which moves in a complete circular path</li></ul></li></ul>

- 45/24 • • Flying sawing machines with lever-supported saw carrier which oscillates in an arc
- 45/26 • with high-speed cutting discs, performing the cut by frictional heat melting the material (grinders for cutting-off B24B 27/06)
- 47/00 Sawing machines or sawing devices working with circular saw blades, characterised only by constructional features of particular parts** (constructional features of these parts per se B23Q; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]
- 47/02 • of frames; of guiding arrangements for work-table or saw-carrier
- 47/04 • of devices for feeding, positioning, clamping, or rotating work
- 47/06 • • for stock of indefinite length
- 47/08 • of devices for bringing the circular saw blade to the workpiece or removing same therefrom
- 47/10 • • actuated by fluid or gas pressure
- 47/12 • of drives for circular saw blades
- 49/00 Machines or devices for sawing with straight reciprocating saw blades, e.g. hacksaws**
- 49/02 • Hacksaw machines with straight saw blades secured to a rectilinearly-guided frame, e.g. with the frame fed stepwise in the plane of the guide
- 49/04 • Hacksaw machines with straight saw blades secured to a pivotally-arranged frame
- 49/06 • Hacksaw machines with straight saw blades for special use
- 49/08 • Pad-saw machines, i.e. machines in which the blade is attached to a carrier at one end only
- 49/10 • Hand-held or hand-operated sawing devices with straight saw blades
- 49/11 • • for special purposes, e.g. offset-blade hand saws [5]
- 49/12 • • Hacksaws (B23D 49/11, B23D 49/16 take precedence; bows adjustable in length or height B23D 51/12) [5]
- 49/14 • • Pad saws (B23D 49/11, B23D 49/16 take precedence) [5]
- 49/16 • • actuated by electric or magnetic power or prime movers (B23D 49/11 takes precedence) [5]
- 51/00 Sawing machines or sawing devices working with straight blades, characterised only by constructional features of particular parts** (constructional features of these parts per se B23Q; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00); **Carrying or attaching means for tools, covered by this subclass, which are connected to a carrier at both ends** [4]
- 51/01 • characterised by the handle [5]
- 51/02 • of beds; of guiding arrangements for work-tables or saw carriers; of frames [5]
- 51/03 • • with extensible or collapsible frames [5]
- 51/04 • of devices for feeding, positioning, clamping, or rotating work
- 51/06 • • for stock of indefinite length
- 51/08 • of devices for mounting straight saw blades or other tools
- 51/10 • • for hand-held or hand-operated devices
- 51/12 • • for use with tools, dealt with in this subclass, which are connected to a carrier at both ends, e.g. bows adjustable in length or height
- 51/14 • • • Attachment of the tool
- 51/16 • of drives or feed mechanisms for straight tools, e.g. saw blades, or bows
- 51/18 • • actuated by fluid or gas pressure (B23D 51/20 takes precedence)
- 51/20 • • with controlled feed of the tool, or with special arrangements for relieving or lifting the tool on the return stroke
- 53/00 Machines or devices for sawing with strap saw blades which are effectively endless in use, e.g. for contour cutting**
- 53/02 • with stationarily-mounted wheels carrying the strap (B23D 53/06 takes precedence)
- 53/04 • with the wheels carrying the strap mounted shiftably or swingingly, other than merely for adjustment
- 53/06 • with shiftable or swinging work-table
- 53/08 • for cutting profiled stock
- 53/10 • Sawing devices working with strap saw blades able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool
- 53/12 • Hand-held or hand-operated sawing devices working with strap saw blades
- 55/00 Sawing machines or sawing devices working with strap saw blades, characterised only by constructional features of particular parts** (constructional features of these parts per se B23Q)
- 55/02 • of frames; of tables
- 55/04 • of devices for feeding or clamping work
- 55/06 • of drives for strap saw blades; of wheel mountings
- 55/08 • of devices for guiding or feeding strap saw blades
- 55/10 • of devices for tensioning strap saw blades (B23D 55/06 takes precedence; incorporated in the strap B23D 61/12)
- 57/00 Sawing machines or sawing devices not covered by one of groups B23D 45/00-B23D 55/00**
- 57/02 • with chain saws
- 59/00 Accessories specially designed for sawing machines or sawing devices** (lubricating or cooling machine tools in general B23Q 11/12)
- 59/02 • Devices for lubricating or cooling circular saw blades
- 59/04 • Devices for lubricating or cooling straight or strap saw blades
- 61/00 Tools for sawing machines or sawing devices** (tools for trepanning B23B 51/04); **Clamping devices for these tools**
- 61/02 • Circular saw blades
- 61/04 • • with inserted saw teeth
- 61/06 • • • in exchangeable arrangement
- 61/08 • • Ring saw blades with internal saw teeth
- 61/10 • • clamped between hubs; Clamping or aligning devices therefor
- 61/12 • Straight saw blades; Strap saw blades
- 61/14 • • with inserted saw teeth
- 61/16 • • • in exchangeable arrangement
- 61/18 • Sawing tools of special type, e.g. wire saw strands, saw blades or saw wire equipped with diamonds or other abrasive particles in selected individual positions
- 63/00 Dressing the tools of sawing machines or sawing devices for use in cutting any kind of material, e.g. in the manufacture of sawing tools**
- 63/02 • Setting saw teeth by means of hand-operated devices

## B23D

- 63/04 • Setting saw teeth of circular, straight, or strap saw blades by means of power-operated devices
- 63/06 • Upsetting the cutting edges of saw teeth, e.g. swaging
- 63/08 • Sharpening the cutting edges of saw teeth
- 63/10 • • by filing
- 63/12 • • by grinding
- 63/14 • • • Sharpening circular saw blades
- 63/16 • • of chain saws (of mortise chain cutters B24B 3/14)
- 63/18 • Straightening damaged saw blades; Reconditioning the side surface of saw blades, e.g. by grinding
- 63/20 • Combined processes for dressing saw teeth, e.g. both hardening and setting

### 65/00 Making tools for sawing machines or sawing devices for use in cutting any kind of material

- 65/02 • Making saw teeth by punching, cutting, or planing
- 65/04 • Making saw teeth by milling

## Filing or rasping

- 67/00 **Filing or rasping machines or devices** (securing arrangements for files or rasps B23D 71/00)
- 67/02 • with reciprocating tools, mounted on a yoke or the like
- 67/04 • with reciprocating tools, attached to a carrier at one end only
- 67/06 • with rotating tools
- 67/08 • with tools mounted on an endless chain or belt
- 67/10 • for special use, e.g. for filing keys; Accessories therefor
- 67/12 • Hand-held or hand-operated filing or rasping devices (hand files or rasps B23D 71/04)

- 69/00 **Filing or rasping machines or devices, characterised only by constructional features of particular parts, e.g. guiding arrangements, drives** (constructional features of these parts *per se* B23Q; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00); **Accessories for filing or rasping** (attached to the tool B23D 71/10) [4]
- 69/02 • Guiding arrangements for hand tools

- 71/00 **Filing or rasping tools; Securing arrangements therefor** (tool holders for machine tools B23Q 3/00; handles for hand implements B25G)
- 71/02 • for filing or rasping machines or devices
- 71/04 • Hand files or hand rasps (carrying or attaching means for tools which are connected to a carrier at both ends B23D 51/12; guiding arrangements B23D 69/02)
- 71/06 • • using a single interchangeable blade
- 71/08 • • using a plurality of interchangeable cutting elements
- 71/10 • Accessories for filing or rasping tools, e.g. for preventing scoring of workpieces by the edges of the tool

### 73/00 Making files or rasps

- 73/02 • Preliminary treatment of blanks, e.g. grinding, polishing, specially adapted for the manufacture of files or rasps

- 73/04 • Methods or machines for the manufacture of files or rasps (non-mechanical methods, see the relevant classes)
- 73/06 • • Cutting the working surfaces by means of chisels
- 73/08 • • Milling, planing, slotting, knurling, or broaching the working surfaces
- 73/10 • • Grinding the working surfaces
- 73/12 • • Peculiar procedures for sharpening or otherwise treating the working surfaces (special treatment by sand-blast B24C 1/02; sharpening files by etching C23F 1/06)
- 73/14 • Tools or accessories specially adapted for making files or rasps, e.g. chisels, supporting-frames

## Reaming bored holes

- 75/00 **Reaming machines or reaming devices** (tool holders for machine tools B23Q 3/00; handles for hand implements B25G)

### 77/00 Reaming tools

- 77/02 • Reamers with inserted cutting edges
- 77/04 • • with cutting edges adjustable to different diameters along the whole cutting length
- 77/06 • Reamers with means for compensating wear (B23D 77/04 takes precedence)
- 77/08 • • by spreading slotted parts of the tool body
- 77/10 • • by expanding a tube-like non-slotted part of the tool body
- 77/12 • Reamers with cutting edges arranged in tapered form
- 77/14 • Reamers for special use, e.g. for working cylinder ridges

- 79/00 **Methods, machines or devices not covered elsewhere, for working metal by removal of material** (by combined operations B23D 81/00; working of metal by the action of a high concentration of electric current B23H; cutting by electron-beam B23K 15/00, by laser beam B23K 26/00; other working of metal B23P; tool holders for machine tools B23Q 3/00; handles for hand implements B25G)

- 79/02 • Machines or devices for scraping (turning machines for bevelling, chamfering, or deburring the ends of bars or tubes B23B 5/16; scrubbing or peeling ingots by milling B23C 3/14)
- 79/04 • • with rotating cutting-tool, e.g. for smoothing linings of bearings
- 79/06 • • with reciprocating cutting-tool
- 79/08 • • Hand scraping-implements
- 79/10 • • Accessories for holding scraping tools or work to be scraped
- 79/12 • Machines or devices for peeling bars or tubes by making use of cutting bits arranged around the workpiece, otherwise than by turning (by turning B23B 5/12) [2]

- 81/00 **Methods, machines, or devices for working metal, covered by more than one main group in this subclass** (in combination with other metal-working operations B23P 13/00, B23P 23/00)

**B23F MAKING GEARS OR TOOTHED RACKS** (by stamping B21D; by rolling B21H; by forging or pressing B21K; by casting B22; arrangements for copying or controlling B23Q; machines or devices for grinding or polishing, in general B24B)

### Note(s)

- This subclass covers:
  - the use of methods or apparatus specially designed to produce accurately the shapes of gear teeth which are essential for proper intermeshing of toothed gearing elements to ensure the required relative motions;
  - the use of similar methods or apparatus in the production of other articles of toothed or like form, e.g. dog clutches, splined shafts, milling cutters.
- This subclass does not cover the production of such other articles of toothed or like form using methods or apparatus other than those mentioned under Note (1) above.
- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "gear teeth" covers the teeth or lobes of other accurately-intermeshing members having relative movement of a similar kind, such as rotors of rotary pumps and blowers;
  - "profile" may include the outline of both faces or only one face of a tooth, or the opposing faces of adjacent teeth;
  - "straight" means that a tooth as a whole (ignoring any curvature of the tooth-face alone, e.g. crowning) is straight in the direction of its length, for example as seen in the direction of a radius of a spur wheel. It accordingly includes the teeth of helical gears and of the normal type of bevel gear;
  - "broach-milling" means milling with a rotary cutter having a number of teeth of progressively increasing depth or width.

### Subclass index

#### MAKING GEAR TEETH

General methods.....	1/00, 3/00, 17/00
Making teeth with special shape.....	5/00, 7/00, 9/00, 15/00, 17/00
Finishing.....	19/00
Tools; accessories.....	21/00, 23/00

#### MAKING WORMS

Methods.....	13/00
Worm wheels.....	11/00
Accessories.....	23/00

#### MAKING OTHER GEARING WHEELS OF SPECIAL TYPE.....15/00

<b>1/00</b>	<b>Making gear teeth by tools of which the profile matches the profile of the required surface</b> (special adaptations for making curved teeth B23F 9/00)	5/18	• • the tool having the same profile as a tooth of a crown wheel
1/02	• by grinding	5/20	• by milling
1/04	• by planing or slotting	5/22	• • the tool being a hob for making spur gears
1/06	• by milling	5/24	• • the tool being a hob for making bevel gears
1/08	• by broaching; by broach-milling	5/26	• • the tool having the same profile as a tooth or teeth of a rack, for making spur gears
<b>3/00</b>	<b>Making gear teeth involving copying operations controlled by templates having a profile which matches that of the required tooth face or part thereof or a copy thereof to a different scale</b> (copying systems or devices <u>per se</u> B23Q 35/00)	5/27	• • the tool having the same profile as a tooth or teeth of a crown or bevel wheel [2]
		5/28	• by broaching; by broach-milling
<b>5/00</b>	<b>Making straight gear teeth involving moving a tool relatively to a workpiece with a rolling-off or an enveloping motion with respect to the gear teeth to be made</b>	<b>7/00</b>	<b>Making herring-bone gear teeth</b>
5/02	• by grinding	<b>9/00</b>	<b>Making gears having teeth curved in their longitudinal direction</b>
5/04	• • the tool being a grinding worm	9/02	• by grinding
5/06	• • the tool being a grinding disc with a plane front surface	9/04	• by planing or slotting with reciprocating cutting tools
5/08	• • the tool being a grinding disc having the same profile as the tooth or teeth of a rack	9/06	• • having a shape similar to a spur wheel of part thereof
5/10	• • the tool being a grinding disc having the same profile as the tooth or teeth of a crown or bevel wheel	9/07	• • having a shape similar to a crown wheel or a part thereof [2]
5/12	• by planing or slotting	9/08	• by milling, e.g. with helicoidal hob
5/14	• • the tool having the same profile as a tooth or teeth of a rack	9/10	• • with a face-mill
5/16	• • the tool having a shape similar to that of a spur wheel or part thereof	9/12	• • • for non-continuous generating processes [2]
		9/14	• • • for continuous generating processes [2]
		<b>11/00</b>	<b>Making worm wheels, e.g. by hobbing</b>
		<b>13/00</b>	<b>Making worms by methods essentially requiring the use of machines of the gear-cutting type</b> (making screw-thread B23G)
		13/02	• Making worms of cylindrical shape

## B23F

13/04	• • by grinding	21/06	• • having a profile which matches a gear tooth profile
13/06	• Making worms of globoidal shape	21/08	• • having the same profile as a tooth or teeth of a rack
13/08	• • by grinding	21/10	• • Gear-shaper cutters having a shape similar to a spur wheel or part thereof
15/00	<b>Methods or machines for making gear wheels of special kinds, not covered by groups B23F 7/00-B23F 13/00</b>	21/12	• Milling tools
15/02	• Making gear teeth on wheels of varying radius of operation, e.g. on elliptical wheels	21/14	• • Profile cutters of disc type
15/04	• Making fine-pitch gear teeth on clock wheels or the like by special machining	21/16	• • Hobs
15/06	• Making gear teeth on the front surface of wheels, e.g. for clutches or couplings with toothed faces	21/18	• • • Taper hobs, e.g. for bevel gears
15/08	• Making intermeshing rotors, e.g. of pumps	21/20	• • Fly cutters
17/00	<b>Special methods or machines for making gear teeth, not covered by groups B23F 1/00-B23F 15/00</b>	21/22	• • Face-mills for longitudinally-curved gear teeth
19/00	<b>Finishing gear teeth by other tools than those used for manufacturing gear teeth</b>	21/23	• • • with cutter teeth arranged on a spiral curve for continuous generating processes [2]
19/02	• Lapping gear teeth	21/24	• Broach-milling tools
19/04	• • Lapping spur gears by making use of a correspondingly shaped counterpart	21/26	• Broaching tools
19/05	• Honing gear teeth [2]	21/28	• Shaving cutters
19/06	• Shaving the faces of gear teeth	23/00	<b>Accessories or equipment combined with or arranged in, or specially designed to form part of, gear-cutting machines</b> (accessories or equipment not restricted to gear-cutting machines B23Q; tool-guiding mechanisms, <u>see</u> the relevant groups for making gear teeth)
19/10	• Chamfering the end edges of gear teeth	23/02	• Loading or chucking arrangements for workpieces
19/12	• • by grinding	23/04	• • Loading arrangements
21/00	<b>Tools specially adapted for use in machines for manufacturing gear teeth</b>	23/06	• • Chucking arrangements
21/02	• Grinding discs; Grinding worms (truing grinding tools B24B; grinding tools in general B24D)	23/08	• Index mechanisms
21/03	• Honing tools [2]	23/10	• Arrangements for compensating irregularities in drives or indexing mechanisms
21/04	• Planing or slotting tools	23/12	• Other devices, e.g. tool holders; Checking devices for controlling workpieces in machines for manufacturing gear teeth

**B23G THREAD CUTTING; WORKING OF SCREWS, BOLT HEADS, OR NUTS, IN CONJUNCTION THEREWITH** (thread-forming by corrugating tubes B21D 15/04, by rolling B21H 3/02, by forging, pressing, or hammering B21K 1/56; making helical grooves by turning B23B 5/48, by milling B23C 3/32, by grinding B24B 19/02; arrangements for copying or controlling B23Q)

### Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "thread cutting" includes the use of tools similar both in form and in manner of use to thread-cutting tools, but without removing any material.

### Subclass index

THREAD-CUTTING METHODS, MACHINES OR DEVICES THEREFOR.....	1/00, 3/00, 7/00, 9/00
FINISHING.....	9/00
TOOLS.....	5/00, 7/02
ACCESSORIES.....	11/00

1/00	<b>Thread cutting; Automatic machines specially designed therefor</b>	1/12	• • Machines with a toothed cutter in the shape of a spur gear or the like which is rotated to generate the thread profile as the work rotates
1/02	• on an external or internal cylindrical or conical surface, e.g. on recesses (B23G 1/16, B23G 1/22, B23G 1/32, B23G 1/36 take precedence)	1/14	• • • specially adapted for making conical screws, e.g. wood-screws
1/04	• • Machines with one working-spindle	1/16	• in holes of workpieces by taps (B23G 1/26, B23G 1/32, B23G 1/36 take precedence)
1/06	• • • specially adapted for making conical screws, e.g. wood-screws	1/18	• • Machines with one working-spindle
1/08	• • Machines with a plurality of working-spindles	1/20	• • Machines with a plurality of working-spindles
1/10	• • • specially adapted for making conical screws, e.g. wood-screws	1/22	• Machines specially designed for operating on pipes or tubes
		1/24	• • portable



- 1/26 • Manually-operated thread-cutting devices (features of the threading tool B23G 5/00)
- 1/28 • • with means for adjusting the threading tool
- 1/30 • • without means for adjusting the threading tool, e.g. with die-stocks (tap wrenches B25B)
- 1/32 • by milling
- 1/34 • • with a cutting bit moving in a closed path arranged eccentrically with respect to the axis of the rotating workpiece
- 1/36 • by grinding
- 1/38 • • with grinding discs guided along the workpiece in accordance with the pitch of the required thread
- 1/40 • • with grinding discs guided radially to the workpiece
- 1/42 • Centreless grinding
- 1/44 • Equipment or accessories specially designed for machines or devices for thread cutting
- 1/46 • • for holding the threading tools
- 1/48 • • for guiding the threading tools
- 1/50 • • for cutting thread by successive operations
- 1/52 • • for operating on pipes or tubes
- 3/00 Arrangements or accessories for enabling machine tools not specially designed only for thread cutting to be used for this purpose, e.g. arrangements for reversing the working-spindle**
- 3/02 • for withdrawing or resetting the threading tool
- 3/04 • • for repeatedly setting the threading tool in a predetermined working position
- 3/06 • for compensating inaccuracies in the pitch of the lead-screw
- 3/08 • for advancing or controlling the threading tool or the work by templates, cams, or the like
- 3/10 • • for cutting thread of variable pitch
- 3/12 • • for using several adjacently-arranged threading tools, e.g. using several chasers
- 3/14 • • for cutting thread of conical shape
- 5/00 Thread-cutting tools; Die-heads**
- 5/02 • without means for adjustment
- 5/04 • • Dies
- 5/06 • • Taps (chucks therefor B23B 31/00)
- 5/08 • with means for adjustment
- 5/10 • • Die-heads
- 5/12 • • • self-releasing
- 5/14 • • Tapping-heads
- 5/16 • • • self-releasing
- 5/18 • Milling cutters
- 5/20 • combined with other tools, e.g. drills
- 7/00 Forming thread by means of tools similar both in form and in manner of use to thread-cutting tools, but without removing any material (features of machines or devices not specially adapted to the particular mode of forming the thread B23G 1/00)**
- 7/02 • Tools for this purpose
- 9/00 Working screws, bolt heads or nuts in conjunction with thread cutting, e.g. slotting screw heads or shanks, removing burrs from screw heads or shanks; Finishing, e.g. polishing, any screw thread (making washers or nuts by processing metal sheets, tubes or profiles without essentially removing material B21D 53/20, B21D 53/24)**
- 11/00 Feeding or discharging mechanisms combined with, or arranged in, or specially adapted for use in connection with, thread-cutting machines (for machine tools in general B23Q)**

**B23H WORKING OF METAL BY THE ACTION OF A HIGH CONCENTRATION OF ELECTRIC CURRENT ON A WORKPIECE USING AN ELECTRODE WHICH TAKES THE PLACE OF A TOOL; SUCH WORKING COMBINED WITH OTHER FORMS OF WORKING OF METAL** (processes for the electrolytic or electrophoretic production of coatings, electroforming, or apparatus therefor C25D; processes for the electrolytic removal of material from objects C25F; manufacturing printed circuits using precipitation techniques to apply the conductive material to form the desired conductive pattern H05K 3/18) [4]

#### Note(s)

This subclass covers the working of metal described as "electroerosion".

#### Subclass index

ELECTRICAL DISCHARGE MACHINING.....	1/00
ELECTROCHEMICAL MACHINING.....	3/00
COMBINED MACHINING.....	5/00
COMMON PROCESSES OR APPARATUS.....	7/00
MACHINING PARTICULAR OBJECTS OR OBTAINING SPECIAL EFFECTS OR RESULTS.....	9/00
AUXILIARY APPARATUS OR DETAILS.....	11/00

- 
- 1/00 Electrical discharge machining, i.e. removing metal with a series of rapidly recurring electrical discharges between an electrode and a workpiece in the presence of a fluid dielectric [4]**
  - 1/02 • Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits or other abnormal discharges [4]
  - 1/04 • Electrodes specially adapted therefor or their manufacture (B23H 9/00 takes precedence) [4]
  - 1/06 • • Electrode material [4]
  - 1/08 • Working media [4]
  - 1/10 • Supply or regeneration of working media [4]
  - 3/00 Electrochemical machining, i.e. removing metal by passing current between an electrode and a workpiece in the presence of an electrolyte [4]**
  - 3/02 • Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits [4]

## B23H

- 3/04 • Electrodes specially adapted therefor or their manufacture (B23H 9/00 takes precedence) [4]
- 3/06 • • Electrode material [4]
- 3/08 • Working media [4]
- 3/10 • Supply or regeneration of working media [4]
- 5/00 Combined machining [4]**
- 5/02 • Electrical discharge machining combined with electrochemical machining [4]
- 5/04 • Electrical discharge machining combined with mechanical working [4]
- 5/06 • Electrochemical machining combined with mechanical working, e.g. grinding or honing [4]
- 5/08 • • Electrolytic grinding [4]
- 5/10 • Electrodes specially adapted therefor or their manufacture (B23H 1/04, B23H 3/04 take precedence) [4]
- 5/12 • Working media [4]
- 5/14 • Supply or regeneration of working media [4]
- 7/00 Processes or apparatus applicable to both electrical discharge machining and electrochemical machining [4]**
- 7/02 • Wire-cutting [4]
- 7/04 • • Apparatus for supplying current to working gap; Electric circuits specially adapted therefor [4]
- 7/06 • • Control of the travel curve of the relative movement between electrode and workpiece [4]
- 7/08 • • Wire electrodes [4]
- 7/10 • • • Supporting, winding or electrical connection of wire-electrode [4]
- 7/12 • Rotating-disc electrodes [4]
- 7/14 • Electric circuits specially adapted therefor, e.g. power supply [4]
- 7/16 • • for preventing short circuits or other abnormal discharges [4]
- 7/18 • • for maintaining or controlling the desired spacing between electrode and workpiece [4]
- 7/20 • • for programme-control, e.g. adaptive [4]
- 7/22 • Electrodes specially adapted therefor or their manufacture (B23H 7/08, B23H 7/12, B23H 9/00 take precedence) [4]
- 7/24 • • Electrode material [4]
- 7/26 • Apparatus for moving or positioning electrode relatively to workpiece; Mounting of electrode [4]
- 7/28 • • Moving electrode in a plane normal to the feed direction, e.g. orbiting [4]
- 7/30 • • Moving electrode in the feed direction (B23H 7/32 takes precedence) [4]
- 7/32 • • Maintaining desired spacing between electrode and workpiece [4]
- 7/34 • Working media [4]
- 7/36 • Supply or regeneration of working media [4]
- 7/38 • Influencing metal working by using specially adapted means not directly involved in the removal of metal, e.g. ultrasonic waves, magnetic fields or laser irradiation [4]
- 9/00 Machining specially adapted for treating particular metal objects or for obtaining special effects or results on metal objects** (heat treatment by cathodic discharge C21D 1/38) [4]
- 9/02 • Trimming or deburring [4]
- 9/04 • Treating surfaces of rolls [4]
- 9/06 • Marking or engraving [4]
- 9/08 • Sharpening [4]
- 9/10 • Working turbine blades or nozzles [4]
- 9/12 • Forming parts of complementary shape, e.g. punch-and-die [4]
- 9/14 • Making holes [4]
- 9/16 • • using an electrolytic jet [4]
- 9/18 • Producing external conical surfaces or spikes (B23H 9/08 takes precedence) [4]
- 11/00 Auxiliary apparatus or details, not otherwise provided for [4]**

**B23K SOLDERING OR UNSOLDERING; WELDING; CLADDING OR PLATING BY SOLDERING OR WELDING; CUTTING BY APPLYING HEAT LOCALLY, e.g. FLAME CUTTING; WORKING BY LASER BEAM** (making metal-coated products by extruding metal B21C 23/22; building up linings or coverings by casting B22D 19/08; casting by dipping B22D 23/04; manufacture of composite layers by sintering metal powder B22F 7/00; arrangements on machine tools for copying or controlling B23Q; covering metals or covering materials with metals, not otherwise provided for C23C; burners F23D)

### Note(s)

1. This subclass covers also electric circuits specially adapted for the purposes covered by the title of the subclass.
2. In this subclass, the following term is used with the meaning indicated:
  - "soldering" means uniting metals using solder and applying heat without melting either of the parts to be united.
3. In groups B23K 1/00-B23K 31/00, it is desirable to add the indexing codes of groups B23K 101/00 or B23K 103/00.

### Subclass index

SOLDERING.....	1/00, 3/00
WELDING	
Characterised by the means used to produce heat	
by flame.....	5/00
by electricity.....	9/00, 11/00, 13/00
by means of plasma.....	10/00
by nuclear particles.....	15/00, 17/00
by alumino-thermic means.....	23/00
by laser beam.....	26/00
otherwise.....	25/00, 28/00
Characterised by the use of impact or pressure.....	20/00

Characterised by other features, processes not restricted to one particular group of this subclass.....	28/00
CUTTING BY APPLYING HEAT LOCALLY; SEVERING.....	7/00, 9/00, 15/00, 26/00, 28/00, 11/00
SCARFING, DESURFACING.....	7/00
MATERIALS; AUXILIARY DEVICES.....	35/00, 37/00
SPECIAL PROCESSES.....	31/00, 33/00

### **Soldering, e.g. brazing, or unsoldering**

- 1/00 Soldering, e.g. brazing, or unsoldering** (B23K 3/00 takes precedence; characterised only by the use of special materials or media B23K 35/00; dip or wave soldering in the manufacture of printed circuits H05K 3/34) [5]
- 1/002 • Soldering by means of induction heating [5]
  - 1/005 • Soldering by means of radiant energy [5]
  - 1/008 • Soldering within a furnace (B23K 1/012 takes precedence) [5]
  - 1/012 • Soldering with the use of hot gas [5]
  - 1/015 • • Vapour-condensation soldering [5]
  - 1/018 • Unsoldering; Removal of melted solder or other residues [5]
  - 1/06 • making use of vibrations, e.g. supersonic vibrations
  - 1/08 • Soldering by means of dipping in molten solder
  - 1/14 • specially adapted for soldering seams (making tubes involving operations other than soldering B21C) [5]
  - 1/16 • • longitudinal seams, e.g. of shells [5]
  - 1/18 • • circumferential seams, e.g. of shells [5]
  - 1/19 • taking account of the properties of the materials to be soldered [3]
  - 1/20 • Preliminary treatment of work or areas to be soldered, e.g. in respect of a galvanic coating (preparation of surfaces in particular ways, see the relevant classes for the treatments or the materials treated, e.g. C04B, C23C)
- 3/00 Tools, devices, or special appurtenances for soldering, e.g. brazing, or unsoldering, not specially adapted for particular methods** (materials used for soldering B23K 35/00) [5]
- 3/02 • Soldering irons; Bits
  - 3/03 • • electrically heated [5]
  - 3/04 • Heating appliances (soldering lamps or blow-pipes F23D; electric heating in general H05B)
  - 3/047 • • electric [5]
  - 3/053 • • • using resistance wires [5]
  - 3/06 • Solder feeding devices; Solder melting pans
  - 3/08 • Auxiliary devices therefor (cleaning pipes or tubes or systems of pipes or tubes, e.g. before soldering, B08B 9/02) [5]

### **Flame welding or cutting**

- 5/00 Gas flame welding**
- 5/02 • Seam welding (making tubes involving operations other than welding B21C)
  - 5/04 • • using additional profiled strips or like of welding metal along seam edges
  - 5/06 • • Welding longitudinal seams
  - 5/08 • • Welding circumferential seams
  - 5/10 • Welding workpieces essentially comprising layers of different metals, e.g. plated workpieces

- 5/12 • taking account of the properties of the material to be welded
  - 5/14 • • of non-ferrous metals (B23K 5/16 takes precedence)
  - 5/16 • • of different metals
  - 5/18 • for purposes other than joining parts, e.g. built-up welding
  - 5/20 • making use of vibrations, e.g. supersonic vibrations
  - 5/213 • Preliminary treatment [3]
  - 5/22 • Auxiliary equipment, e.g. backings, guides
  - 5/24 • • Arrangements for supporting torches (not restricted to flame welding B23K 37/02)
- 7/00 Cutting, scarfing, or desurfacing by applying flames**
- 7/06 • Machines, apparatus, or equipment specially designed for scarfing or desurfacing
  - 7/08 • by applying additional compounds or means favouring the cutting, scarfing, or desurfacing procedure
  - 7/10 • Auxiliary devices, e.g. for guiding or supporting the torch (guiding means applicable to other metal-working machines B23Q)

### **Electric welding or cutting**

- 9/00 Arc welding or cutting** (electro-slag welding B23K 25/00; welding transformers H01F; welding generators H02K)
- 9/007 • Spot arc welding [5]
  - 9/013 • Arc cutting, gouging, scarfing or desurfacing [5]
  - 9/02 • Seam welding; Backing means; Inserts
  - 9/022 • • Welding by making use of electrode vibrations [5]
  - 9/025 • • for rectilinear seams [5]
  - 9/028 • • for curved planar seams [5]
  - 9/032 • • for three-dimensional seams [5]
  - 9/035 • • with backing means disposed under the seam [5]
  - 9/038 • • using moulding means (not restricted to arc welding B23K 37/06) [5]
  - 9/04 • Welding for other purposes than joining, e.g. built-up welding
  - 9/06 • Arrangements or circuits for starting the arc, e.g. by generating ignition voltage, or for stabilising the arc [5]
  - 9/067 • • Starting the arc [5]
  - 9/073 • • Stabilising the arc [5]
  - 9/08 • Arrangements or circuits for magnetic control of the arc
  - 9/09 • Arrangements or circuits for arc welding with pulsed current or voltage [3]
  - 9/095 • Monitoring or automatic control of welding parameters [5]
  - 9/10 • Other electric circuits therefor; Protective circuits; Remote controls
  - 9/12 • Automatic feeding or moving of electrodes or work for spot or seam welding or cutting

- 9/127 • • Means for tracking lines during arc welding or cutting (copying in general B23Q 35/00) [5]
- 9/133 • • Means for feeding electrodes, e.g. drums, rolls, motors [5]
- 9/14 • making use of insulated electrodes
- 9/16 • making use of shielding gas
- 9/167 • • and of a non-consumable electrode [5]
- 9/173 • • and of consumable electrode [5]
- 9/18 • Submerged-arc welding
- 9/20 • Stud welding
- 9/22 • Percussion welding
- 9/23 • taking account of the properties of the materials to be welded [3]
- 9/235 • Preliminary treatment [3]
- 9/24 • Features related to electrodes (form or composition of electrodes B23K 35/00)
- 9/26 • • Accessories for electrodes, e.g. ignition tips
- 9/28 • • Supporting devices for electrodes (not restricted to arc welding or cutting B23K 37/02)
- 9/29 • • • Supporting devices adapted for making use of shielding means [5]
- 9/30 • • • Vibrating holders for electrodes (B23K 9/022 takes precedence) [5]
- 9/32 • Accessories (earthing connections H01R)

#### **10/00 Welding or cutting by means of a plasma [5]**

- 10/02 • Plasma welding [5]

#### **11/00 Resistance welding; Severing by resistance heating**

- 11/02 • Pressure butt welding
- 11/04 • Flash butt welding
- 11/06 • using roller electrodes
- 11/08 • Seam welding not restricted to one of the preceding subgroups
- 11/087 • • for rectilinear seams [5]
- 11/093 • • for curved planar seams [5]
- 11/10 • Spot welding; Stitch welding
- 11/11 • • Spot welding [5]
- 11/12 • • making use of vibrations
- 11/14 • Projection welding
- 11/16 • taking account of the properties of the material to be welded
- 11/18 • • of non-ferrous metals (B23K 11/20 takes precedence)
- 11/20 • • of different metals
- 11/22 • Severing by resistance heating
- 11/24 • Electric supply or control circuits therefor
- 11/25 • • Monitoring devices [5]
- 11/26 • • Storage discharge welding
- 11/28 • Portable welding equipment
- 11/30 • Features relating to electrodes (form or composition of electrodes B23K 35/00)
- 11/31 • • Electrode holders (not restricted to resistance welding or severing by resistance heating B23K 37/02) [5]
- 11/34 • Preliminary treatment [3]
- 11/36 • Auxiliary equipment (B23K 11/31 takes precedence) [3, 5]

#### **13/00 Welding by high-frequency current heating [5]**

- 13/01 • by induction heating [5]
- 13/02 • • Seam welding
- 13/04 • by conduction heating [5]

- 13/06 • characterised by the shielding of the welding zone against influence of the surrounding atmosphere (selection of media B23K 35/38) [5]
- 13/08 • Electric supply or control circuits therefor [5]

#### **Other welding or cutting: Working by laser beam [3]**

- 15/00 Electron-beam welding or cutting** (electron- or ion-beam tubes H01J 37/00)
- 15/02 • Control circuits therefor [5]
- 15/04 • for welding annular seams [5]
- 15/06 • within a vacuum chamber (B23K 15/04 takes precedence) [5]
- 15/08 • Removing material, e.g. by cutting, by hole drilling [5]
- 15/10 • Non-vacuum electron beam-welding or cutting [5]
- 17/00 Use of the energy of nuclear particles in welding or related techniques**
- 20/00 Non-electric welding by applying impact or other pressure, with or without the application of heat, e.g. cladding or plating [3]**
- 20/02 • by means of a press [3]
- 20/04 • by means of a rolling mill [3]
- 20/06 • by means of high energy impulses, e.g. magnetic energy [3]
- 20/08 • • Explosive welding [3]
- 20/10 • making use of vibrations, e.g. ultrasonic welding [3]
- 20/12 • the heat being generated by friction; Friction welding [3]
- 20/14 • Preventing or minimising gas access, or using protective gases or vacuum during welding (formed by material interposed between workpieces B23K 20/18) [3]
- 20/16 • with interposition of special material to facilitate connection of the parts, e.g. material for absorbing or producing gas [3]
- 20/18 • Zonal welding by interposing weld-preventing substances between zones not to be welded [3]
- 20/20 • Special methods allowing subsequent separation, e.g. of metals of high quality from scrap material [3]
- 20/22 • taking account of the properties of the materials to be welded [3]
- 20/227 • • with ferrous layer [5]
- 20/233 • • without ferrous layer [5]
- 20/24 • Preliminary treatment [3]
- 20/26 • Auxiliary equipment [3]
- 23/00 Alumino-thermic welding**
- 25/00 Slag welding, i.e. using a heated layer or mass of powder, slag, or the like in contact with the material to be joined** (B23K 23/00 takes precedence; submerged-arc welding B23K 9/18)
- 26/00 Working by laser beam, e.g. welding, cutting, boring** (lasers H01S 3/00) [2, 3]
- 26/02 • Positioning or observing the workpiece, e.g. with respect to the point of impact; Aligning, aiming or focusing the laser beam [3]
- 26/03 • • Observing the workpiece [7]
- 26/04 • • Automatically aligning, aiming or focusing the laser beam, e.g. using the back-scattered light [3]
- 26/06 • • Shaping the laser beam, e.g. by masks or multi-focusing (optical elements, systems, or apparatus, in general G02B) [3]

26/067	• • • Dividing the beam into multiple beams, e.g. multi-focusing [7]	35/12	• • not specially designed for use as electrodes
26/073	• • • Shaping the laser spot [7]	35/14	• • • for soldering
26/08	• Devices involving relative movement between laser beam and workpiece [3]	35/16	• • • of non-circular cross-section; with special arrangement, e.g. internal (B23K 35/14 takes precedence)
26/10	• • using a fixed support [3]	35/18	• • • • multi-cored; multiple
26/12	• in a special atmosphere, e.g. in an enclosure [3]	35/20	• • • • with more than one layer of coating or sheathing material
26/14	• using a flow, e.g. a jet of gas, in conjunction with the laser beam (B23K 26/12 takes precedence) [3]	35/22	• characterised by the composition or nature of the material
26/16	• Removing of by-products, e.g. particles or vapours produced during treatment of a workpiece (by a flow of gas B23K 26/14) [3]	35/24	• • Selection of soldering or welding materials proper (B23K 35/34 takes precedence)
26/18	• using absorbing layers on the material being worked, e.g. for marking or protecting purposes [3]	35/26	• • • with the principal constituent melting at less than 400°C
26/20	• Bonding, e.g. welding (soldering by means of radiant energy B23K 1/005; joining of preformed plastics parts by heating using laser beam B29C 65/16) [7]	35/28	• • • with the principal constituent melting at less than 950°C
26/22	• • Spot welding [7]	35/30	• • • with the principal constituent melting at less than 1550°C
26/24	• • Seam welding [7]	35/32	• • • with the principal constituent melting at more than 1550°C
26/26	• • • of rectilinear seams [7]	35/34	• • comprising compounds which yield metals when heated
26/28	• • • of curved planar seams [7]	35/36	• • Selection of non-metallic compositions, e.g. coatings, fluxes (B23K 35/34 takes precedence); Selection of soldering or welding materials, conjoint with selection of non-metallic compositions, both selections being of interest (selection of soldering or welding materials proper B23K 35/24) [2]
26/30	• • • of three-dimensional seams [7]	35/362	• • • Selection of compositions of fluxes (B23K 35/365, B23K 35/368 take precedence) [2]
26/32	• • taking account of the properties of the material involved [7]	35/363	• • • for soldering or brazing [4]
26/34	• Welding for purposes other than joining, e.g. build-up welding [7]	35/365	• • • Selection of non-metallic compositions of coating materials either alone or conjoint with selection of soldering or welding materials [2]
26/36	• Removing material [7]	35/368	• • • Selection of non-metallic compositions of core materials either alone or conjoint with selection of soldering or welding materials [2]
26/38	• • by boring or cutting [7]	35/38	• • Selection of media, e.g. special atmospheres for surrounding the working area
26/40	• • taking account of the properties of the material involved [7]	35/40	• Making wire or rods for soldering or welding (processes involving a single technical art, <u>see</u> the relevant subclasses, e.g. B05D, B21C)
26/42	• Preliminary treatment; Auxiliary operations or equipment (B23K 26/16 takes precedence) [7]		
<b>28/00</b>	<b>Welding or cutting not covered by groups B23K 5/00-B23K 26/00</b> (joining workpieces by electrolysis C25D 2/00; electrolytic removal of materials C25F) [2]	<b>37/00</b>	<b>Auxiliary devices or processes, not specially adapted to a procedure covered by only one of the other main groups of this subclass</b> (eye-shields for welders worn on the operator's body or carried in the hand A61F 9/00; applicable to metal-working machines other than soldering, welding, or flame-cutting machines B23Q; other protective shields F16P 1/06)
28/02	• Combined welding or cutting procedures or apparatus [2]	37/02	• Carriages for supporting the welding or cutting element
<hr/>		37/04	• for holding or positioning work
<b>31/00</b>	<b>Processes relevant to this subclass, specially adapted for particular articles or purposes, but not covered by any single one of main groups B23K 1/00-B23K 28/00</b> (making tubes or profiled bars involving operations other than soldering or welding B21C 37/04, B21C 37/08)	37/047	• • moving work to adjust its position between soldering, welding or cutting steps (B23K 37/053 takes precedence) [5]
31/02	• relating to soldering or welding (dip or wave soldering in the manufacture of printed circuits H05K 3/34)	37/053	• • aligning cylindrical work; Clamping devices therefor [5]
31/10	• relating to cutting or desurfacing	37/06	• for positioning the molten material, e.g. confining it to a desired area
31/12	• relating to investigating the properties, e.g. the weldability, of materials [5]	37/08	• for flash removal [5]
<b>33/00</b>	<b>Specially-profiled edge portions of workpieces for making soldering or welding connections; Filling the seams formed thereby</b>		
<b>35/00</b>	<b>Rods, electrodes, materials, or media, for use in soldering, welding, or cutting</b>		
35/02	• characterised by mechanical features, e.g. shape		
35/04	• • specially designed for use as electrodes (ignition tips for arc welding or cutting B23K 9/26)		
35/06	• • • of non-circular cross-section; with special arrangement, e.g. internal		
35/08	• • • • multi-cored; multiple		
35/10	• • • • with more than one layer of coating or sheathing material		

**Indexing scheme associated with groups B23K 1/00-B23K 31/00, relating to articles made by soldering, welding or cutting or to materials to be soldered, welded or cut. [5]**

**101/00 Articles made by soldering, welding or cutting [5]**

- 101/02 • Honeycomb structures [5]
- 101/04 • Tubular or hollow articles [5]
- 101/06 • • Tubes [5]
- 101/08 • • • finned or ribbed [5]
- 101/10 • • Pipe-lines [5]
- 101/12 • • Vessels [5]
- 101/14 • • Heat exchangers [5]
- 101/16 • Bands or sheets of indefinite length [5]
- 101/18 • Sheet panels [5]
- 101/20 • Tools [5]
- 101/22 • Nets, wire fabrics or the like [5]
- 101/24 • Frameworks [5]
- 101/26 • Railway- or like rails [5]
- 101/28 • Beams [5]
- 101/30 • Chains, hoops or rings [5]

- 101/32 • Wires [5]
- 101/34 • Coated articles [5]
- 101/36 • Electric or electronic devices [5]
- 101/38 • • Conductors [5]
- 101/40 • • Semiconductor devices [5]
- 101/42 • • Printed circuits [5]

**103/00 Materials to be soldered, welded or cut [5]**

- 103/02 • Iron or ferrous alloys [5]
- 103/04 • • Steel alloys [5]
- 103/06 • • Cast-iron alloys [5]
- 103/08 • Non-ferrous metals or alloys [5]
- 103/10 • • Aluminium or alloys thereof [5]
- 103/12 • • Copper or alloys thereof [5]
- 103/14 • • Titanium or alloys thereof [5]
- 103/16 • Composite materials [5]
- 103/18 • Dissimilar materials [5]
- 103/20 • • Ferrous alloys and aluminium or alloys thereof [5]
- 103/22 • • Ferrous alloys and copper or alloys thereof [5]
- 103/24 • • Ferrous alloys and titanium or alloys thereof [5]

**B23P OTHER WORKING OF METAL; COMBINED OPERATIONS; UNIVERSAL MACHINE TOOLS** (arrangements for copying or controlling B23Q)

**Note(s)**

1. This subclass does not cover non-mechanical operations on non-metallic materials unless such operations are specially mentioned in this subclass.
2. In this subclass, the following expressions are used with the meanings indicated:
  - "combined operations" excludes the assembling of parts if it is an essential feature of the next metal-working operation, since it is not regarded as an operation per se;
  - "working of metal" and equivalent expressions include non-mechanical treatment of metal so far as it is not provided for in any other class or subclass, for example, in C21D, C22C, C22F, C23. Thus, combinations of such non-mechanical treatment with other metal-working are classified in this subclass.
3. Attention is drawn to the Notes following the title of class B23.

**Subclass index**

**METAL-WORKING PROCESSES**

Setting of diamonds.....	5/00
Reconditioning; finishing.....	6/00, 9/00
Connecting or disconnecting.....	11/00, 19/00, 21/00
Other processes.....	6/00, 13/00, 15/00, 17/00
Auxiliary treatments.....	25/00

**COMBINED PROCESSES; MULTI-PURPOSE MACHINES**

Reconditioning; finishing.....	6/00, 9/00
Other combined operations.....	6/00, 23/00
Auxiliary treatments.....	25/00

**5/00 Setting gems or the like on metal parts, e.g. diamonds on tools**

**6/00 Restoring or reconditioning objects** (straightening or restoring form of sheet metal, metal rods, metal tubes, metal profiles, or specific articles made therefrom B21D 1/00, B21D 3/00; repairing defective or damaged objects by casting techniques B22D 19/10; procedures or apparatus covered by a single other subclass, see the relevant subclass) [3]

- 6/02 • Pistons or cylinders [3]
- 6/04 • Repairing fractures or cracked metal parts or products, e.g. castings [3]

**9/00 Treating or finishing surfaces mechanically, with or without calibrating, primarily to resist wear or impact, e.g. smoothing or roughening turbine blades or bearings** (treatment covered by a single other subclass, see the relevant subclass, e.g. B24C, C21D 7/00, C22F 1/00); **Features of such surfaces not otherwise provided for, their treatment being unspecified**

- 9/02 • Treating or finishing by applying pressure, e.g. knurling (B23P 9/04 takes precedence)
- 9/04 • Treating or finishing by hammering or applying repeated pressure

11/00	<b>Connecting or disconnecting metal parts or objects by metal-working techniques, not otherwise provided for</b> (connecting sheet metal or metal tubes, rods or profiles B21D 39/00; riveting B21J; soldering, unsoldering, welding B23K; hand tools for connecting wire or strip B25B 25/00; connecting metal parts by adhesives F16B 11/00) [1, 7]	15/52	• • • taps
11/02	• by first expanding and then shrinking or <i>vice versa</i> , e.g. by using pressure fluids; by making force fits	17/00	<b>Metal-working operations, not covered by a single other subclass or another group in this subclass</b>
13/00	<b>Making metal objects by operations essentially involving machining but not covered by a single other subclass</b> (making specific objects B23P 15/00)	17/02	• Single metal-working processes; Machines or apparatus therefor
13/02	• in which only the machining operations are important	17/04	• characterised by the nature of the material involved or the kind of product independently of its shape
13/04	• involving slicing of profiled material	17/06	• • Making steel wool or the like
15/00	<b>Making specific metal objects by operations not covered by a single other subclass or a group in this subclass</b>	19/00	<b>Machines for simply fitting together or separating metal parts or objects, or metal and non-metal parts, whether or not involving some deformation; Tools or devices therefor so far as not provided for in other classes</b> (hand tools in general B25) [3]
15/02	• turbine or like blades from one piece	19/02	• for connecting objects by press fit or for detaching same (B23P 19/10 takes precedence) [1, 7]
15/04	• turbine or like blades from several pieces	19/027	• • using hydraulic or pneumatic means (B23P 19/033 takes precedence) [7]
15/06	• piston rings from one piece	19/033	• • using vibration [7]
15/08	• piston rings from several pieces	19/04	• for assembling or disassembling parts (B23P 19/10 takes precedence) [1, 7]
15/10	• pistons	19/06	• • Screw or nut setting or loosening machines
15/12	• gratings	19/08	• • Machines for placing washers, circlips, or the like on bolts or other members
15/14	• gear parts, e.g. gear wheels	19/10	• Aligning parts to be fitted together [7]
15/16	• plates with holes of very small diameter e.g. for spinning or burner nozzles	19/12	• • Alignment of parts for insertion into bores [7]
15/18	• brake shoes	21/00	<b>Machines for assembling a multiplicity of different parts to compose units, with or without preceding or subsequent working of such parts, e.g. with programme control</b>
15/20	• railroad requirements, e.g. buffers	23/00	<b>Machines or arrangements of machines for performing specified combinations of different metal-working operations not covered by a single other subclass</b> (combined horizontal boring and milling machines B23B 39/02; if the particular kinds of operation are not essential B23Q 37/00-B23Q 41/00; features relating to operations covered by a single subclass, <u>see</u> the relevant subclass for the operation)
15/22	• cartridges or like shells	23/02	• Machine tools for performing different machining operations (lathes, e.g. capstan lathes, B23B)
15/24	• dies (B21C 3/18, B21C 25/10, B21D 37/20 take precedence)	23/04	• for both machining and other metal-working operations
15/26	• heat exchangers	23/06	• Metal-working plant comprising a number of associated machines or apparatus
15/28	• cutting tools (sawing tools B23D 63/00, B23D 65/00; files or rasps B23D 73/00)	25/00	<b>Auxiliary treatment of workpieces, before or during machining operations, to facilitate the action of the tool or the attainment of a desired final condition of the work, e.g. relief of internal stress</b>
15/30	• • lathes or like tools		
15/32	• • twist-drills		
15/34	• • milling cutters		
15/36	• • • for thread cutting		
15/38	• • planing or slotting tools (B23P 15/30 takes precedence)		
15/40	• • shearing tools		
15/42	• • broaching tools		
15/44	• • scraping or shaving tools		
15/46	• • reaming tools		
15/48	• • threading tools (milling cutters for thread-cutting B23P 15/36)		
15/50	• • • dies		
B23Q	<b>DETAILS, COMPONENTS, OR ACCESSORIES FOR MACHINE TOOLS, e.g. ARRANGEMENTS FOR COPYING OR CONTROLLING</b> (tools of the kind used in lathes or boring machines B23B 27/00); <b>MACHINE TOOLS IN GENERAL, CHARACTERISED BY THE CONSTRUCTION OF PARTICULAR DETAILS OR COMPONENTS; COMBINATIONS OR ASSOCIATIONS OF METAL-WORKING MACHINES, NOT DIRECTED TO A PARTICULAR RESULT</b>		

**Note(s)**

1. In this subclass, groups designating parts of machine tools cover machine tools characterised by constructional features of such parts.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "controlling" means influencing a variable in any way, e.g. changing its direction or its value (including changing it to or from zero), maintaining it constant, limiting its range of variation;
  - "regulation" means maintaining a variable automatically at a desired value or within a desired range of values. The desired value or range may be fixed, or manually varied, or may vary with time according to a predetermined "programme" or according to variation of another variable. Regulation is a form of control;

- "automatic control" is often used in the art as a synonym for regulation.
3. Attention is drawn to the Notes following the title of class B23.

### Subclass index

BASIC COMPONENTS OF MACHINE TOOLS.....	1/00, 9/00
DEVICES FOR SUPPORTING, HANDLING, OR FEEDING WORK OR TOOLS.....	3/00, 5/00, 7/00
AUXILIARY EQUIPMENT, SAFETY DEVICES.....	11/00, 13/00, 27/00
MEASURING; INDICATING; CONTROLLING	
Controlling the movements of the tool or work.....	15/00, 16/00, 23/00
Indicating.....	17/00
COPYING.....	33/00, 35/00
MACHINES COMPRISING UNITS OR SUB-ASSEMBLIES, TRANSFER MACHINES, ASSOCIATIONS OF MACHINES OR UNITS.....	37/00, 39/00, 41/00

#### 1/00 Members which are comprised in the general build-up of a form of machine, particularly relatively large fixed members (B23Q 37/00 takes precedence)

- 1/01 • Frames, beds, pillars or like members; Arrangement of ways [6]
- 1/03 • Stationary work or tool supports (B23Q 1/70 takes precedence; auxiliary tables B23Q 1/74; tailstocks B23B 23/00) [6]
- 1/25 • Movable or adjustable work or tool supports [6]
- 1/26 • • characterised by constructional features relating to the co-operation of relatively movable members; Means for preventing relative movement of such members [6]
- 1/28 • • • Means for securing sliding members in any desired position [6]
- 1/30 • • • controlled in conjunction with the feed mechanism [6]
- 1/32 • • • Relative movement obtained by co-operating spherical surfaces, e.g. ball-and-socket joints [6]
- 1/34 • • • Relative movement obtained by use of deformable elements, e.g. piezo-electric, magnetostrictive, elastic or thermally-dilatable elements (sensitive elements capable of producing movement or displacement for purposes not limited to measurement G12B 1/00) [6]
- 1/36 • • • • Springs [6]
- 1/38 • • • using fluid bearings or fluid cushion supports [6]
- 1/40 • • • using ball, roller or wheel arrangements [6]
- 1/42 • • • using T-, V-, dovetail-section or like guides (B23Q 1/40 takes precedence) [6]
- 1/44 • • using particular mechanisms (B23Q 1/26 takes precedence) [6]

#### Note(s)

1. In this group, the following expressions are used with the meaning indicated:
- "sliding pair" means a pair consisting of two elements operating in such a way that only straight line movement between both elements is possible;
  - "rotating pair" means a pair consisting of two elements operating in such a way that only rotary movement between both elements is possible;
  - "screw pair" means a pair consisting of two elements operating in such a way as to produce simultaneous rotation and axial translation between both elements.

2. In this group, where more than one pair of elements is provided on the same axis for the same kind of movement, the pairs are regarded as a single pair for the purposes of classification.
- 1/46 • • • with screw pairs [6]
- 1/48 • • • with sliding pairs and rotating pairs (B23Q 1/46 takes precedence) [6]
- 1/50 • • • with rotating pairs only [6]
- 1/52 • • • • a single rotating pair [6]
- 1/54 • • • • two rotating pairs only [6]
- 1/56 • • • with sliding pairs only [6]
- 1/58 • • • • a single sliding pair [6]
- 1/60 • • • • two sliding pairs only [6]
- 1/62 • • • • with perpendicular axes, e.g. cross-slides [6]
- 1/64 • • characterised by the purpose of the movement (indexing equipment B23Q 16/02) [6]
- 1/66 • • Work-tables interchangeably movable into operating positions [6]
- 1/68 • • • for withdrawing tool or work during reverse movement [6]
- 1/70 • Stationary or movable members for carrying working-spindles for attachment of tools or work (headstocks or the like, working-spindle supports B23B 19/00; working-spindles B23B 19/02) [6]
- 1/72 • Auxiliary arrangements; Interconnections between auxiliary tables and movable machine elements [6]
- 1/74 • • Auxiliary tables [6]
- 1/76 • • Steadies; Rests [6]

#### 3/00 Devices holding, supporting, or positioning, work or tools, of a kind normally removable from the machine (work-tables or other parts, e.g. faceplates, normally not incorporating means for securing work B23Q 1/00; automatic position control B23Q 15/00; rotary tool heads for turning-machines B23B 3/24, B23B 3/26; non-driven tool holders B23B 29/00; general features of turrets B23B 29/24; tools or bench devices for fastening, connecting, disengaging or holding B25B)

- 3/02 • for mounting on a work-table, tool-slide, or analogous part (B23Q 3/15 takes precedence)
- 3/04 • • adjustable in inclination
- 3/06 • • Work-clamping means
- 3/08 • • • other than mechanically-actuated
- 3/10 • • Auxiliary devices, e.g. bolsters, extension members
- 3/12 • for securing to a spindle in general (B23Q 3/152 takes precedence; chucks B23B 31/02)
- 3/14 • • Mandrels in general (expansion mandrels B23B 31/40)



- 3/15 • Devices for holding work using magnetic or electric force acting directly on the work
- 3/152 • • Rotary devices
- 3/154 • • Stationary devices
- 3/155 • Arrangements for automatic insertion or removal of tools
- 3/157 • • of rotary tools
- 3/16 • controlled in conjunction with the operation of the tool
- 3/18 • for positioning only
- 5/00 Driving or feeding mechanisms; Control arrangements therefor** (automatic control B23Q 15/00; copying B23Q 33/00, B23Q 35/00; specially adapted for boring or drilling machines B23B 39/10, B23B 47/02)
  - 5/02 • Driving main working members
  - 5/027 • • reciprocating members [2]
  - 5/033 • • • driven essentially by fluid pressure [2]
  - 5/04 • • rotary shafts, e.g. working-spindles
  - 5/06 • • • driven essentially by fluid pressure or pneumatic power
  - 5/08 • • • • electrically controlled
  - 5/10 • • • driven essentially by electrical means
  - 5/12 • • • Mechanical drives with means for varying the speed ratio
  - 5/14 • • • • step-by-step
  - 5/16 • • • • infinitely-variable
  - 5/18 • • • • Devices for preselecting speed of working-spindle
  - 5/20 • • • Adjusting or stopping working-spindles in a predetermined position
  - 5/22 • Feeding members carrying tools or work
  - 5/26 • • Fluid-pressure drives [3]
  - 5/28 • • Electric drives [3]
  - 5/32 • • Feeding working-spindles (feeding working-spindle supports B23Q 5/34) [3]
  - 5/34 • • Feeding other members supporting tools or work, e.g. saddles, tool-slides, through mechanical transmission [3]
  - 5/36 • • • in which a servomotor forms an essential element [3]
  - 5/38 • • • feeding continuously [3]
  - 5/40 • • • • by feed shaft, e.g. lead screw [3]
  - 5/42 • • • • • Mechanism associated with headstock [3]
  - 5/44 • • • • • Mechanism associated with the moving member [3]
  - 5/46 • • • • • with variable speed ratio [3]
  - 5/48 • • • • • by use of toothed gears [3]
  - 5/50 • • • feeding step by step [3]
  - 5/52 • • Limiting feed movement
  - 5/54 • Arrangements or details not restricted to group B23Q 5/02 or group B23Q 5/22 respectively
  - 5/56 • • Preventing backlash
  - 5/58 • • Safety devices
- 7/00 Arrangements for handling work specially combined with or arranged in, or specially adapted for use in connection with, machine tools, e.g. for conveying, loading, positioning, discharging, sorting** (incorporated in working-spindles B23B 13/00, B23B 19/02; for automatic or semi-automatic turning machines B23B 15/00) [2]
  - 7/02 • by means of drums or rotating tables or discs
  - 7/03 • by means of endless chain conveyers (B23Q 7/16 takes precedence) [2]
  - 7/04 • by means of grippers

- 7/05 • by means of roller-ways (B23Q 7/16 takes precedence) [2]
- 7/06 • by means of pushers
- 7/08 • by means of slides or chutes
- 7/10 • by means of magazines
- 7/12 • Sorting arrangements
- 7/14 • co-ordinated in production lines
- 7/16 • Loading work on to conveyers; Arranging work on conveyers, e.g. varying spacing between individual workpieces [2]
- 7/18 • • Orienting work on conveyers [2]
- 9/00 Arrangements for supporting or guiding portable metal-working machines or apparatus** (for tapping pipes B23B 41/08; specially designed for drilling B23B 45/14)
  - 9/02 • for securing machines or apparatus to workpieces, or other parts, of particular shape, e.g. to beams of particular cross-section

### Accessories

- 11/00 Accessories fitted to machine tools for keeping tools or parts of the machine in good working condition or for cooling work; Safety devices specially combined with or arranged in, or specially adapted for use in connection with, machine tools** (in respect of boring or drilling machines B23B 47/24, B23B 47/32 take precedence; safety devices in general F16P)
  - 11/02 • Devices for removing scrap from the cutting teeth of circular cutters
  - 11/04 • Arrangements preventing overload of tools, e.g. restricting load
  - 11/06 • Safety devices for circular cutters
  - 11/08 • Protective coverings for parts of machine tools; Splash guards
  - 11/10 • Arrangements for cooling or lubricating tools or work (incorporated in tools, see the relevant subclass for the tool) [1, 2006.01]
  - 11/12 • Arrangements for cooling or lubricating parts of the machine (B23Q 11/14 takes precedence) [1, 2006.01]
  - 11/14 • Methods or arrangements for maintaining a constant temperature in parts of machine tools [1, 2006.01]
- 13/00 Equipment for use with tools or cutters when not in operation, e.g. protectors for storage**

### Measuring; Indicating; Controlling [3]

- 15/00 Automatic control or regulation of feed movement, cutting velocity or position of tool or work [3]**
  - 15/007 • while the tool acts upon the workpiece [3]
  - 15/013 • • Control or regulation of feed movement (B23Q 15/12 takes precedence) [3]
  - 15/02 • • • according to the instantaneous size and the required size of the workpiece acted upon (B23Q 15/06 takes precedence) [3]
  - 15/04 • • • according to the final size of the previously machined workpiece (B23Q 15/06 takes precedence) [3]
  - 15/06 • • • according to measuring results produced by two or more gauging methods using different measuring principles, e.g. by both optical and mechanical gauging [3]
  - 15/08 • • Control or regulation of cutting velocity (B23Q 15/12 takes precedence) [3]

## B23Q

- 15/10 • • • to maintain constant cutting velocity between tool and workpiece [3]
- 15/12 • • Adaptive control, i.e. adjusting itself to have a performance which is optimum according to a preassigned criterion [3]
- 15/14 • • Control or regulation of the orientation of the tool with respect to the work [3]
- 15/16 • • Compensation for wear of the tool [3]
- 15/18 • • Compensation of tool-deflection due to temperature or force [3]
- 15/20 • before or after the tool acts upon the workpiece [3]
- 15/22 • • Control or regulation of position of tool or workpiece [3]
- 15/24 • • • of linear position [3]
- 15/26 • • • of angular position [3]
- 15/28 • • with compensation for tool wear [3]

**16/00 Equipment for precise positioning of tool or work into particular locations not otherwise provided for** (automatic control or regulation of position of tool or work B23Q 15/22; arrangements for indicating or measuring existing or desired position of tool or work B23Q 17/22) [4]

- 16/02 • Indexing equipment (specially adapted for gear-cutting machines B23F 23/08) [4]
- 16/04 • • having intermediate members, e.g. pawls, for locking the relatively movable parts in the indexed position [4]
- 16/06 • • • Rotary indexing [4]
- 16/08 • • having means for clamping the relatively movable parts together in the indexed position [4]
- 16/10 • • • Rotary indexing [4]
- 16/12 • • using optics [4]

**17/00 Arrangements for indicating or measuring on machine tools** (for automatic control or regulation of feed movement, cutting velocity or position of tool or work B23Q 15/00) [3, 4]

- 17/09 • for indicating or measuring cutting pressure or cutting-tool condition, e.g. cutting ability, load on tool (arrangements preventing overload of tools B23Q 11/04; devices for indicating failure of drills during boring B23B 49/00) [4]
- 17/10 • for indicating or measuring cutting speed or number of revolutions
- 17/12 • for indicating or measuring vibration
- 17/20 • for indicating or measuring workpiece characteristics, e.g. contour, dimension, hardness [4]
- 17/22 • for indicating or measuring existing or desired position of tool or work [4]
- 17/24 • using optics [4]

**23/00 Arrangements for compensating for irregularities or wear, e.g. of ways, of setting mechanisms** (automatic control B23Q 15/00) [3]

**27/00 Geometrical mechanisms for the production of work of particular shapes, not fully provided for in another subclass**

## Copying

### Note(s)

In groups B23Q 33/00 or B23Q 35/00, the following term is used with the meaning indicated:

- "copying" covers the derivation of a required shape from a pattern, of the same or a different shape or scale, by a mechanism or equivalent means controlled by a member following the pattern. The pattern may be a model or drawing, or an element such as a cam incorporated in the operating mechanism of a machine. This term does not cover the derivation of a required shape from simple geometrical shapes, e.g. generating a cycloid by a rolling circle, which in general is provided for in group B23Q 27/00.

## 33/00 Methods for copying

**35/00 Control systems or devices for copying directly from a pattern or a master model; Devices for use in copying manually**

- 35/02 • Copying discrete points from the pattern, e.g. for determining the position of holes to be drilled
- 35/04 • using a feeler or the like travelling along the outline of the pattern, model or drawing; Feelers, patterns, or models therefor
- 35/06 • • specially adapted for controlling successive operations, e.g. separate cuts, on a workpiece
- 35/08 • • Means for transforming movement of the feeler or the like into feed movement of tool or work
- 35/10 • • • mechanically only
- 35/12 • • • involving electrical means (programme recording for copying purposes in a separate apparatus G05, G11)
- 35/121 • • • • using mechanical sensing
- 35/122 • • • • the feeler opening or closing electrical contacts
- 35/123 • • • • the feeler varying the impedance in a circuit
- 35/124 • • • • • varying resistance
- 35/125 • • • • • varying capacitance
- 35/126 • • • • • varying inductance
- 35/127 • • • • using non-mechanical sensing
- 35/128 • • • • Sensing by using optical means
- 35/129 • • • • Sensing by means of electric discharges
- 35/13 • • • • Sensing by using magnetic means
- 35/14 • • • • controlling one or more electromotors
- 35/16 • • • • controlling fluid motors
- 35/18 • • • involving fluid means (B23Q 35/16 takes precedence)
- 35/20 • • • with special means for varying the ratio of reproduction
- 35/22 • • • specially adapted for compensating for wear of the tool
- 35/24 • • Feelers; Feeler units
- 35/26 • • designed for physical contact with a pattern or a model
- 35/28 • • • • for control of a mechanical copying system
- 35/30 • • • • for control of an electrical or electro-hydraulic copying system
- 35/32 • • • • • in which the feeler makes and breaks an electrical contact or contacts, e.g. with brush-type tracers
- 35/34 • • • • • in which the feeler varies an electrical characteristic in a circuit, e.g. capacity, frequency
- 35/36 • • • • for control of a hydraulic or pneumatic copying system

- 35/38 • • • designed for sensing the pattern, model, or drawing without physical contact (sensing by means of a fluid jet B23Q 35/36)
- 35/40 • • • • involving optical or photoelectrical systems
- 35/42 • • Patterns; Master models
- 35/44 • • • provided with means for adjusting the contact face, e.g. comprising flexible bands held by set-screws
- 35/46 • • • Supporting devices therefor
- 35/48 • using a feeler or the like travelling to-and-fro between opposite parts of the outline of the pattern, model, or drawing

**Metal-working machines comprising units or sub-assemblies:**  
**Associations of metal-working machines or units**

- 37/00 Metal-working machines, or constructional combinations thereof, built-up from units designed so that at least some of the units can form parts of different machines or combinations; Units therefor in so far as the feature of interchangeability is important** (features relating to particular metal-working operations, see the relevant subclasses, e.g. B23P 23/00)
- 39/00 Metal-working machines incorporating a plurality of sub-assemblies, each capable of performing a metal-working operation** (B23Q 33/00, B23P 23/00 take precedence; if the operations are similar and the kind of operation is essential, see the relevant subclass for the operation)

- 39/02 • the sub-assemblies being capable of being brought to act at a single operating station
- 39/04 • the sub-assemblies being arranged to operate simultaneously at different stations, e.g. with an annular work-table moved in steps (associations of machines connected only by work-transferring means B23Q 41/00)

- 41/00 Combinations or associations of metal-working machines not directed to a particular result according to classes B21, B23, or B24** (B23Q 37/00, B23Q 39/00 take precedence; features relating to operations performed, if the different metal-working operations are of the same kind, see the subclass for the kind of operation, e.g. punching B21D, welding B23K, grinding B24B; features relating to technically specified combinations of different metal-working operations B23P 23/00)
- 41/02 • Features relating to transfer of work between machines (arrangements for handling work for machine tools co-ordinated in production lines B23Q 7/14)
- 41/04 • Features relating to relative arrangements of machines
- 41/06 • Features relating to organisation of working of machines
- 41/08 • Features relating to maintenance of efficient operation

## **B24 GRINDING; POLISHING**

### **Note(s)**

In this class, the following term is used with the meaning indicated:

- "grinding" is used in its most general sense to mean machining and covers, in particular, "corrective" operations.

**B24B MACHINES, DEVICES, OR PROCESSES FOR GRINDING OR POLISHING** (grinding of gear teeth B23F, of screw threads B23G 1/36; by electro-erosion B23H; abrasive or related blasting B24C; tools for grinding, buffing or sharpening B24D; polishing compositions C09G 1/00; abrasives C09K 3/14; electrolytic etching or polishing C25F 3/00; grinding arrangements for use on assembled railway tracks E01B 31/17); **DRESSING OR CONDITIONING OF ABRADING SURFACES; FEEDING OF GRINDING, POLISHING, OR LAPPING AGENTS [2]**

### **Note(s)**

1. In this subclass, the following term is used with the meaning indicated:
  - "polishing" means the smoothing of a surface, i.e. a surface improvement but no improvement of the dimensional accuracy as would occur in a "grinding" operation.
2. Attention is drawn to Notes (1) and (2) following the title of subclass B23F.

### **Subclass index**

GRINDING OR POLISHING PROCESSES NOT PARTICULAR TO SPECIFIC MACHINES, DEVICES

OR WORK.....1/00

GRINDING; GENERAL FEATURES OF GRINDING, POLISHING, OR FINISHING

Grinding of surfaces with simple shapes.....5/00, 7/00, 9/00, 11/00  
 Grinding of surfaces of special shape.....3/00, 13/00-19/00  
 Grinding or polishing using abrasive belts.....21/00  
 Portable machines.....23/00  
 Other machines.....25/00, 27/00  
 Component parts.....41/00-47/00  
 Measuring, indicating, controlling; Safety.....49/00, 51/00, 55/00  
 Dressing or conditioning of grinding tools; Feeding or applying grinding, polishing or lapping agents.....53/00, 57/00

## POLISHING OR FINISHING

Polishing, burnishing.....	29/00, 39/00
by tumbling.....	31/00
Honing, superfinishing.....	33/00, 35/00
Lapping.....	37/00

**Note(s)**

In groups B24B 1/00-B24B 27/00, in connection with glass the terms "grinding" and "polishing" are treated as being equivalent.

**1/00 Processes of grinding or polishing; Use of auxiliary equipment in connection with such processes**  
(processes characterised by the use of special machines or devices, see the relevant places for those machines or devices) [4]

- 1/04 • subjecting the grinding or polishing tools, the abrading or polishing medium or work to vibration, e.g. grinding with ultrasonic frequency (polishing or abrading surfaces on work by means of tumbling apparatus B24B 31/00, involving oscillating or vibrating containers B24B 31/06; superfinishing surfaces on work, e.g. by means of abrading blocks reciprocating with high frequency, B24B 35/00) [4]
- 3/00 Sharpening cutting edges, e.g. of tools; Accessories therefor, e.g. for holding the tools** (non-abrasive sharpening devices for scythes, sickles, or the like A01D 3/00; sharpening devices designed as components of machines with cutters, see the relevant places for the machines, e.g. A01D 75/08, B26D 7/12; sharpening of saw teeth B23D 63/12; sharpening of files or rasps B23D 73/00; grinding of die-stocks or chasers B23G 1/36)
- 3/02 • of milling cutters
- 3/04 • • of plain milling cutters
- 3/06 • • of face or end milling cutters or cutter heads, e.g. of shank type
- 3/08 • • of profile milling cutters, e.g. of disc type
- 3/10 • • of routers or engraving needles
- 3/12 • • of hobs
- 3/14 • • of mortise chain cutters
- 3/16 • of broaches
- 3/18 • of taps or reamers
- 3/20 • • Tapering or chamfering taps or reamers
- 3/22 • • Relief cutting of taps or reamers
- 3/24 • of drills (by fluting the shank B24B 19/04)
- 3/26 • • of the point of twist drills
- 3/28 • • • by swivelling the drill around an axis angularly to the drill axis
- 3/30 • • • • and rotating the drill about its own axis
- 3/32 • • • for thinning the point
- 3/33 • • of drills for stone
- 3/34 • of turning or planing tools or tool bits, e.g. gear cutters (B24B 3/36 takes precedence)
- 3/36 • of cutting blades (B24B 3/58 takes precedence)
- 3/38 • • for planing wood, e.g. cutter blades
- 3/40 • • Processes or apparatus specially adapted for sharpening curved edges
- 3/42 • • helically bent, e.g. for lawn mowers
- 3/44 • • of scythes or sickles [2]
- 3/46 • • of disc blades
- 3/48 • • of razor blades or razors (by an abrasive block without mechanisms B24D)
- 3/50 • • • operated manually

- 3/52 • • of shear blades or scissors
- 3/54 • • of hand or table knives
- 3/55 • of knife bars for harvesting machines
- 3/56 • of slicing bands (B24B 3/58 takes precedence)
- 3/58 • of tools having scalloped cutting edges
- 3/60 • of tools not covered by the preceding subgroups

**Grinding surfaces of particular forms**

- 5/00 Machines or devices designed for grinding surfaces of revolution on work, including those which also grind adjacent plane surfaces; Accessories therefor** (B24B 11/00-B24B 21/00 take precedence; honing machines or devices using abrading blocks performing axial and rotary movements superimposed on one another B24B 33/00) [2]
- 5/01 • for combined grinding of surfaces of revolution and of adjacent plane surfaces on work [4]
- 5/02 • involving centres or chucks for holding work
- 5/04 • • for grinding cylindrical surfaces externally (grinding combined cylindrical and conical surfaces B24B 5/14)
- 5/06 • • for grinding cylindrical surfaces internally (B24B 5/40 takes precedence)
- 5/08 • • • involving a vertical tool spindle
- 5/10 • • • involving a horizontal tool spindle
- 5/12 • • for grinding cylindrical surfaces both externally and internally with several grinding wheels
- 5/14 • • for grinding conical surfaces, e.g. of centres
- 5/16 • • for grinding peculiarly profiled surfaces, e.g. bulged
- 5/18 • involving centreless means for supporting, guiding, floating or rotating work (centreless turning B23B 5/08; centreless grinding of threads B23G 1/42) [2]
- 5/20 • • involving grooved abrading blocks
- 5/22 • • for grinding cylindrical surfaces, e.g. on bolts
- 5/24 • • for grinding conical surfaces
- 5/26 • • for grinding peculiarly profiled surfaces, e.g. bulged
- 5/28 • • for grinding outer surfaces concentrically to bores, involving additional centring means
- 5/30 • • Regulating-wheels; Equipment therefor
- 5/307 • • Means for supporting work [3]
- 5/313 • involving work-supporting means carrying several workpieces to be operated on in succession [3]
- 5/32 • • the work-supporting means being indexable [3]
- 5/35 • Accessories [3]
- 5/36 • Single-purpose machines or devices
- 5/37 • • for grinding rolls, e.g. barrel-shaped rolls [4]
- 5/38 • • for externally grinding travelling elongated stock, e.g. wire
- 5/40 • • for grinding tubes internally
- 5/42 • • for grinding crankshafts or crankpins
- 5/44 • • for grinding rims of vehicle wheels, e.g. for bicycles
- 5/46 • • for grinding railway car wheels

- 5/48 • • for grinding walls of very fine holes, e.g. in drawing-dies
- 5/50 • characterised by a special design with respect to properties of the material of non-metallic articles to be ground, e.g. strings (cutting profiles into the treads of tyres B29D 30/68)
- 7/00 Machines or devices designed for grinding plane surfaces on work, including polishing plane glass surfaces; Accessories therefor** (B24B 21/00 takes precedence; honing of plane surfaces on work B24B 33/055) [4]
- 7/02 • involving a reciprocatingly-moved work-table (involving a reciprocatingly-moved grinding wheel in combination with a stationary work-table B24B 7/07) [4]
- 7/04 • involving a rotary work-table
- 7/06 • involving conveyer belts, a sequence of travelling work-tables or the like
- 7/07 • involving a stationary work-table [4]
- 7/08 • • having an abrasive wheel built in
- 7/10 • Single-purpose machines or devices (grinding tools or machines specially adapted for use on assembled railway track E01B 31/17)
- 7/12 • • for grinding travelling elongated stock, e.g. strip-shaped work [4]
- 7/13 • • • grinding while stock moves from coil to coil [4]
- 7/14 • • for grinding slideways (portable grinding machines designed for fastening on workpieces B24B 23/08) [4]
- 7/16 • • for grinding end faces, e.g. of gauges, rollers, nuts, piston rings (for combined grinding of surfaces of revolution and of adjacent plane surfaces on work B24B 5/01; for grinding edges or bevels on work B24B 9/00) [4]
- 7/17 • • • for simultaneously grinding opposite and parallel end faces, e.g. double disc grinders [4]
- 7/18 • • for grinding floorings, walls, ceilings or the like (machines or devices for cleaning floorings A47L 11/00, A47L 13/00)
- 7/19 • • for grinding plane decorative patterns [4]
- 7/20 • characterised by a special design with respect to properties of the material of non-metallic articles to be ground
- 7/22 • • for grinding inorganic material, e.g. stone, ceramics, porcelain
- 7/24 • • • for grinding or polishing glass
- 7/26 • • • • for simultaneously grinding or polishing opposite faces of continuously travelling sheets or bands of glass
- 7/28 • • for grinding wood
- 7/30 • • for grinding plastics [4]
- 9/00 Machines or devices designed for grinding edges or bevels on work or for removing burrs; Accessories therefor** (B24B 21/00 takes precedence; for sharpening cutting edges on tools B24B 3/00; removing burrs by loose abrasive material B24B 31/00)
- 9/02 • characterised by a special design with respect to properties of materials specific to articles to be ground
- 9/04 • • of metal, e.g. skate blades
- 9/06 • • of non-metallic inorganic material, e.g. stone, ceramics, porcelain
- 9/08 • • • of glass
- 9/10 • • • • of plate glass
- 9/12 • • • • of hollow glassware, e.g. drinking glasses, preserve jars, television picture tube viewing panels
- 9/14 • • • • of optical work, e.g. lenses, prisms
- 9/16 • • • of diamonds, of jewels or the like; Diamond grinders' dops; Dop holders or tongs (for grinding sharp pointed diamonds or sapphires B24B 19/16) [4]
- 9/18 • • of wood
- 9/20 • • of plastics [4]
- 11/00 Machines or devices designed for grinding spherical surfaces or parts of spherical surfaces on work; Accessories therefor** (specially designed for optical surfaces B24B 13/00, for seat surfaces B24B 15/00)
- 11/02 • for grinding balls
- 11/04 • • involving grinding wheels
- 11/06 • • • acting by the front faces, e.g. of plane, grooved, or bevelled shape
- 11/08 • • • acting by the circumference
- 11/10 • • • of cup type
- 13/00 Machines or devices designed for grinding or polishing optical surfaces on lenses or surfaces of similar shape on other work; Accessories therefor** (edging optical work, e.g. lenses, prisms, B24B 9/14) [2]
- 13/005 • Blocking means, chucks or the like; Alignment devices [4]
- 13/01 • Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools [4]
- 13/015 • of television picture tube viewing panels, headlight reflectors or the like [4]
- 13/02 • by means of tools with abrading surfaces corresponding in shape with the lenses to be made
- 13/04 • grinding of lenses involving grinding wheels controlled by gearing (B24B 13/06 takes precedence) [4]
- 13/06 • grinding of lenses, the tool or work being controlled by information carrying means, e.g. patterns, punched tapes, magnetic tapes [4]
- 15/00 Machines or devices designed for grinding seat surfaces; Accessories therefor** (for spherical surfaces in general B24B 11/00)
- 15/02 • in valve housings
- 15/03 • • using portable or mobile machines [4]
- 15/04 • on valve members
- 15/06 • on openings of bottles; on bottle stoppers or the like [4]
- 15/08 • for grinding co-operating seat surfaces by moving one over the other
- 
- 17/00 Special adaptations of machines or devices for grinding controlled by patterns, drawings, magnetic tapes or the like** (machines or devices so-controlled for grinding the edges of lenses B24B 9/14; for grinding or polishing optical lens surfaces B24B 13/06; for grinding non-circular cross-sections B24B 19/08; for grinding trochoidal surfaces B24B 19/09; for grinding cams B24B 19/12; for grinding turbine blades or the like B24B 19/14; such control means *per se* B23Q 33/00, B23Q 35/00, G05); Accessories therefor [4]
- 17/02 • involving mechanical transmission means only
- 17/04 • involving optical auxiliary means, e.g. optical projection form grinding machines

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- 17/06 • • combined with electrical transmission means, e.g. controlled by photoelectric cells
- 17/08 • involving fluid transmission means only
- 17/10 • involving electrical transmission means only, e.g. controlled by magnetic tape
- 19/00 Single purpose machines or devices for particular grinding operations not covered by any other main group** (tapering, chamfering or relief cutting of taps or reamers B24B 3/20, B24B 3/22; grinding screw threads B23G 1/36)
- 19/02 • for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements [4]
- 19/03 • • for grinding grooves in glass workpieces, e.g. decorative grooves [4]
- 19/04 • • for fluting drill shanks
- 19/06 • • for grinding races, e.g. roller races
- 19/08 • for grinding non-circular cross-sections, e.g. shafts of elliptical or polygonal cross-section
- 19/09 • • for grinding trochoidal surfaces, e.g. in rotor housings of Wankel engines [4]
- 19/10 • • for grinding pistons
- 19/11 • • for grinding the circumferential surface of rings, e.g. piston rings (grinding end faces B24B 7/16, B24B 7/17) [4]
- 19/12 • • for grinding cams or camshafts
- 19/14 • for grinding turbine blades, propeller blades or the like (using grinding belts B24B 21/16) [4]
- 19/16 • for grinding sharp-pointed workpieces, e.g. needles, pens, fish hooks, tweezers, record player styli (grinding bevels on diamonds or sapphires B24B 9/16; polishing of needles B24B 29/08) [4]
- 19/18 • • for grinding carding equipment, e.g. card-clothings (devices for sharpening card-clothings built in, or attachable to, carding machines D01G)
- 19/20 • for grinding dies (for grinding walls of very fine holes B24B 5/48)
- 19/22 • characterised by a special design with respect to properties of the material of non-metallic articles to be ground
- 19/24 • • of wood, e.g. furniture
- 19/26 • for grinding workpieces with arcuate surfaces, e.g. parts of car bodies, bumpers, magnetic recording heads (grinding of spherical surfaces in general B24B 11/00, of optical surfaces on lenses or surfaces of similar shape on other work B24B 13/00) [4]
- 19/28 • • for grinding shoes or linings of drum brakes (of brake drum hubs B24B 5/06; of brake discs B24B 7/17) [4]
- 21/00 Machines or devices using grinding or polishing belts** (for sharpening cutting edges of tools B24B 3/00; portable belt-grinding machines B24B 23/06); **Accessories therefor** [4]
- 21/02 • for grinding rotationally symmetrical surfaces
- 21/04 • for grinding plane surfaces
- 21/06 • • involving members with limited contact area pressing the belt against the work, e.g. shoes sweeping across the whole area to be ground (B24B 21/12 takes precedence)
- 21/08 • • • Pressure shoes; Backing belts
- 21/10 • • involving a rigid member, e.g. pressure bar, table, pressing or supporting the belt over substantially its whole span
- 21/12 • • involving a contact wheel or roller pressing the belt against the work
- 21/14 • • • Contact wheels; Contact rollers; Belt supporting rolls [4]

- 21/16 • for grinding other surfaces of particular shape (single purpose machines for grinding cams or camshafts B24B 19/12) [4]
- 21/18 • Accessories
- 21/20 • • for controlling or adjusting the tracking or the tension of the grinding belt [4]
- 21/22 • • for producing a reciprocation of the grinding belt normal to its direction of movement [4]
- 23/00 Portable grinding machines, e.g. hand-guided; Accessories therefor** (B24B 7/18 takes precedence; for grinding seat surfaces B24B 15/00; having a flexible shaft B24B 27/027; grinders for cutting-off B24B 27/08; dust extraction equipment B24B 55/10; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]
- 23/02 • with rotating grinding tools; Accessories therefor
- 23/03 • • the tool being driven in a combined movement [4]
- 23/04 • with oscillating grinding tools; Accessories therefor [4]
- 23/06 • with abrasive belts, e.g. with endless travelling belts; Accessories therefor [4]
- 23/08 • Portable grinding machines designed for fastening on workpieces or other parts of particular section, e.g. for grinding commutators
- 25/00 Grinding machines of universal type**
- 27/00 Other grinding machines or devices**
- 27/02 • Bench grinders [4]
- 27/027 • having a flexible shaft [4]
- 27/033 • for grinding a surface for cleaning purposes, e.g. for descaling or for grinding off flaws in the surface [4]
- 27/04 • • Grinding machines or devices in which the grinding tool is supported on a swinging arm
- 27/06 • Grinders for cutting-off
- 27/08 • • being portable [4]

### Polishing surfaces; Finishing surfaces

- 29/00 Machines or devices for polishing surfaces on work by means of tools made of soft or flexible material with or without the application of solid or liquid polishing agents** (machines or devices for grinding or polishing glass B24B 7/24, B24B 9/08, B24B 13/00; for grinding or polishing using belts B24B 21/00; polishing tools in general B24D 13/00) [4]
- 29/02 • designed for particular workpieces [4]
- 29/04 • • for rotationally symmetrical workpieces, e.g. ball-, cylinder- or cone-shaped workpieces [4]
- 29/06 • • for elongated workpieces having uniform cross-section in one main direction [4]
- 29/08 • • • the cross-section being circular, e.g. tubes, wires, needles [4]
- 29/10 • • for table cutlery [4]
- 31/00 Machines or devices designed for polishing or abrading surfaces on work by means of tumbling apparatus or other apparatus in which the work or the abrasive material is loose; Accessories therefor** (machines or devices for grinding or polishing glass B24B 7/24, B24B 9/08, B24B 13/00; abrasive blasting machines B24C 3/26)
- 31/02 • involving rotary barrels
- 31/023 • • with tiltable axis [4]
- 31/027 • • with additional oscillating movement [4]

- 31/03 • • the workpieces being continuously-travelling [4]
- 31/033 • • having several rotating or tumbling drums with parallel axes [4]
- 31/037 • • having several rotating or tumbling drums with non-parallel axes [4]
- 31/05 • involving a container formed as a conveyer belt [4]
- 31/06 • involving oscillating or vibrating containers
- 31/067 • • involving a bowl formed as a straight trough [4]
- 31/073 • • involving a bowl being ring- or spiral-shaped [4]
- 31/10 • involving other means for tumbling of work [4]
- 31/104 • • involving a rotating bowl, in which a ring zone of abrasive powder is formed by centrifugal force [4]
- 31/108 • • involving a sectioned bowl, one part of which, e.g. its wall, is stationary and the other part of which is moved, e.g. rotated [4]
- 31/112 • • using magnetically consolidated grinding powder, moved relatively to the workpiece under the influence of pressure [4]
- 31/116 • • using plastically deformable grinding compound, moved relatively to the workpiece under the influence of pressure [4]
- 31/12 • Accessories; Protective equipment or safety devices; Installations for exhaustion of dust or for sound absorption specially designed for machines covered by group B24B 31/00 (in general B24B 55/00) [4]
- 31/14 • • Abrading-bodies specially designed for tumbling apparatus, e.g. abrading-balls
- 31/16 • • Means for separating the workpiece from the abrasive medium at the end of operation [4]
- 33/00 Honing machines or devices; Accessories therefor**
- 33/02 • designed for working internal surfaces of revolution, e.g. of cylindrical or conical shapes
- 33/04 • designed for working external surfaces of revolution
- 33/05 • designed for working grooves, e.g. in gun barrels
- 33/055 • designed for working plane surfaces [4]
- 33/06 • with controlling or gauging equipment (gauging in general G01B; controlling in general G05)
- 33/08 • Honing tools
- 33/10 • Accessories
- 35/00 Machines or devices designed for superfinishing surfaces on work, i.e. by means of abrading blocks reciprocating with high frequency (B24B 3/00 takes precedence)**
- 37/00 Lapping machines or devices, i.e. requiring pulverulent abrading substances inserted between a lap of relatively soft but rigid material and the surface to be lapped; Accessories therefor (B24B 3/00 takes precedence)**
- 37/02 • designed for working surfaces of revolution
- 37/04 • designed for working plane surfaces
- 39/00 Burnishing machines or devices, i.e. requiring pressure members for compacting the surface zone (modifying the physical properties or structure of metal by burnishing C21D 7/08, C22F 1/00); Accessories therefor (B24B 3/00 takes precedence)**
- 39/02 • designed for working internal surfaces of revolution
- 39/04 • designed for working external surfaces of revolution
- 39/06 • designed for working plane surfaces [4]

## **Component parts of general applicability for grinding machines or devices**

- 41/00 Component parts of grinding machines or devices, such as frames, beds, carriages or headstocks**
- 41/02 • Frames; Beds; Carriages
- 41/04 • Headstocks; Working-spindles; Features relating thereto
- 41/047 • • Grinding heads for working on plane surfaces [4]
- 41/053 • • • for grinding or polishing glass [4]
- 41/06 • Work supports, e.g. adjustable steadies
- 45/00 Means for securing grinding wheels on rotary arbors (suppression of vibrations in systems F16F 15/00; testing static or dynamic balancing of machines G01M 1/00)**
- 47/00 Drives or gearings for grinding machines or devices; Equipment therefor**
- 47/02 • for performing a reciprocating movement of carriages or work-tables
- 47/04 • • by mechanical gearing only
- 47/06 • • by liquid or gas pressure only
- 47/08 • • by mechanical gearing combined with fluid systems
- 47/10 • for rotating or reciprocating working-spindles carrying grinding wheels or workpieces
- 47/12 • • by mechanical gearing or electric power (B24B 47/16 takes precedence)
- 47/14 • • by liquid or gas pressure (B24B 47/16 takes precedence)
- 47/16 • • performing a reciprocating movement, e.g. during which the sense of rotation of the working-spindle is reversed
- 47/18 • • for rotating the spindle at a speed adaptable to wear of the grinding wheel
- 47/20 • relating to feed movement
- 47/22 • Equipment for exact control of the position of the grinding tool or work at the start of the grinding operation
- 47/25 • for compensating grinding wheel abrasion resulting from dressing [4]
- 47/26 • Accessories, e.g. stops
- 47/28 • Equipment for preventing backlash

## **Measuring; Indicating; Controlling**

- 49/00 Measuring or gauging equipment for controlling the feed movement of the grinding tool or work; Arrangements of indicating or measuring equipment, e.g. for indicating the start of the grinding operation (B24B 33/06 takes precedence; if applicable to other machine tools, B23Q 15/00-B23Q 17/00 take precedence; gauging instruments in general G01B)**
- 49/02 • according to the instantaneous size and required size of the workpiece acted upon, the measuring or gauging being continuous or intermittent (B24B 49/12 takes precedence) [4]
- 49/03 • • according to the final size of the previously ground workpiece [4]
- 49/04 • • involving measurement of the workpiece at the place of grinding during grinding operation [4]
- 49/05 • • • including the measurement of a first workpiece already machined and of another workpiece being machined and to be matched with the first one [4]

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49/06	<ul style="list-style-type: none"><li>• requiring comparison of the workpiece with standard gauging plugs, rings or the like</li></ul>	53/09	<ul style="list-style-type: none"><li>• • • having transfer elements formed as pantograph mechanism [4]</li></ul>
49/08	<ul style="list-style-type: none"><li>• involving liquid or pneumatic means</li></ul>	53/095	<ul style="list-style-type: none"><li>• Cooling or lubricating during dressing operation (cooling the grinding surfaces B24B 55/02) [4]</li></ul>
49/10	<ul style="list-style-type: none"><li>• involving electrical means (B24B 49/02, B24B 49/08 take precedence)</li></ul>	53/10	<ul style="list-style-type: none"><li>• of travelling flexible backings coated with abrasives; Cleaning of abrasive belts [4]</li></ul>
49/12	<ul style="list-style-type: none"><li>• involving optical means</li></ul>	53/12	<ul style="list-style-type: none"><li>• Dressing tools; Holders therefor [4]</li></ul>
49/14	<ul style="list-style-type: none"><li>• taking regard of the temperature during grinding</li></ul>	53/14	<ul style="list-style-type: none"><li>• • Dressing tools equipped with rotary rollers or cutters; Holders therefor [4]</li></ul>
49/16	<ul style="list-style-type: none"><li>• taking regard of the load</li></ul>		
49/18	<ul style="list-style-type: none"><li>• taking regard of the presence of dressing tools</li></ul>		
51/00	<b>Arrangements for automatic control of a series of individual steps in grinding a workpiece</b>	55/00	<b>Safety devices for grinding or polishing machines; Accessories fitted to grinding or polishing machines for keeping tools or parts of the machine in good working condition</b> (of general applicability for machine tools B23Q 11/00; in general F16P)
53/00	<b>Devices or means for dressing or conditioning abrasive surfaces</b> (compensation for grinding wheel abrasion resulting from dressing B24B 47/25) [4]	55/02	<ul style="list-style-type: none"><li>• Equipment for cooling the grinding surfaces, including devices for feeding coolant (cooling or lubricating during dressing operation B24B 53/095; incorporated in grinding wheels B24D) [4]</li></ul>
53/007	<ul style="list-style-type: none"><li>• Cleaning of grinding wheels [4]</li></ul>	55/03	<ul style="list-style-type: none"><li>• • designed as a complete equipment for feeding or clarifying coolant [4]</li></ul>
53/013	<ul style="list-style-type: none"><li>• Application of loose grinding agent as auxiliary tool during truing operation [4]</li></ul>	55/04	<ul style="list-style-type: none"><li>• Protective covers for the grinding wheel</li></ul>
53/02	<ul style="list-style-type: none"><li>• of plane surfaces on abrasive tools</li></ul>	55/05	<ul style="list-style-type: none"><li>• • specially designed for portable grinding machines [4]</li></ul>
53/04	<ul style="list-style-type: none"><li>• of cylindrical or conical surfaces on abrasive tools or wheels [4]</li></ul>	55/06	<ul style="list-style-type: none"><li>• Dust extraction equipment on grinding or polishing machines (B24B 31/12 takes precedence)</li></ul>
53/047	<ul style="list-style-type: none"><li>• • equipped with one or more diamonds [4]</li></ul>	55/08	<ul style="list-style-type: none"><li>• • specially designed for belt grinding machines [4]</li></ul>
53/053	<ul style="list-style-type: none"><li>• • using a rotary dressing tool [4]</li></ul>	55/10	<ul style="list-style-type: none"><li>• • specially designed for portable grinding machines, e.g. hand-guided [4]</li></ul>
53/06	<ul style="list-style-type: none"><li>• of profiled abrasive wheels</li></ul>	55/12	<ul style="list-style-type: none"><li>• Devices for exhausting mist of oil or coolant; Devices for collecting or recovering materials resulting from grinding or polishing, e.g. of precious metals, precious stones, diamonds or the like [4]</li></ul>
53/065	<ul style="list-style-type: none"><li>• • having other than straight profiles, e.g. crowned (B24B 53/07 takes precedence) [4]</li></ul>	57/00	<b>Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents</b> (for abrasive blasting B24C 1/00, B24C 7/00) [4]
53/07	<ul style="list-style-type: none"><li>• • by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls [4]</li></ul>	57/02	<ul style="list-style-type: none"><li>• for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents [4]</li></ul>
53/075	<ul style="list-style-type: none"><li>• • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/07 takes precedence) [4]</li></ul>	57/04	<ul style="list-style-type: none"><li>• for feeding of solid grinding, polishing or lapping agents [4]</li></ul>
53/08	<ul style="list-style-type: none"><li>• • controlled by information means, e.g. patterns, templets, punched tapes or the like</li></ul>		
53/085	<ul style="list-style-type: none"><li>• • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/09 takes precedence) [4]</li></ul>		

## B24C ABRASIVE OR RELATED BLASTING WITH PARTICULATE MATERIAL

### Note(s)

1. This subclass covers:
  - the use of a blast of any particles or pellets dispersed in air, gas, or liquid for the treatment of surfaces or cutting of materials, the particles usually being of abrasive material;
  - the equivalent use of a jet of particles or pellets projected or energised by means other than a stream of air.
2. In this subclass, the following terms are used with the meanings indicated:
  - "abrasive" covers any material used in the manner mentioned in Note (1) above;
  - "blast" covers any equivalent jet of material mentioned in Note (1) above.

1/00	<b>Methods for use of abrasive blasting for producing particular effects; Use of auxiliary equipment in connection with such methods</b>	1/10	<ul style="list-style-type: none"><li>• for compacting surfaces, e.g. shot-peening (for deforming sheet metal, tubes or profiles B21D 31/06; as a metallurgical treatment C21D 7/00, C22F 1/00)</li></ul>
1/02	<ul style="list-style-type: none"><li>• for sharpening or cleaning cutting tools, e.g. files</li></ul>	3/00	<b>Abrasive blasting machines or devices; Plants</b>
1/04	<ul style="list-style-type: none"><li>• for treating only selected parts of a surface, e.g. for carving stone or glass</li></ul>	3/02	<ul style="list-style-type: none"><li>• characterised by the arrangement of the component assemblies with respect to each other (B24C 3/08, B24C 3/18 take precedence)</li></ul>
1/06	<ul style="list-style-type: none"><li>• for producing matt surfaces, e.g. on plastic materials, on glass</li></ul>	3/04	<ul style="list-style-type: none"><li>• • stationary</li></ul>
1/08	<ul style="list-style-type: none"><li>• for polishing surfaces, e.g. by making use of liquid-borne abrasives</li></ul>	3/06	<ul style="list-style-type: none"><li>• • movable; portable</li></ul>
		3/08	<ul style="list-style-type: none"><li>• essentially adapted for abrasive blasting of travelling stock or travelling workpieces</li></ul>



- 3/10 • • for treating external surfaces
- 3/12 • • • Apparatus using nozzles
- 3/14 • • • Apparatus using impellers
- 3/16 • • for treating internal surfaces
- 3/18 • essentially provided with means for moving workpieces into different working positions (B24C 3/08 takes precedence)
- 3/20 • • the work being supported by turntables
- 3/22 • • • Apparatus using nozzles
- 3/24 • • • Apparatus using impellers
- 3/26 • • the work being supported by barrel cages, i.e. tumblers; Gimbal mountings therefor
- 3/28 • • • Apparatus using nozzles
- 3/30 • • • Apparatus using impellers
- 3/32 • designed for abrasive blasting of particular work, e.g. the internal surfaces of cylinder blocks (B24C 3/08, B24C 3/18 take precedence)
- 3/34 • • for cleaning sparking plugs

#### Accessories or equipment for abrasive blasting machines or devices

- 5/00 **Devices or accessories for generating abrasive blasts**
- 5/02 • Blast guns, e.g. for generating high velocity abrasive fluid jets for cutting materials [5]
- 5/04 • • Nozzles therefor (nozzles in general B05B)
- 5/06 • Impeller wheels; Rotor blades therefor
- 5/08 • Devices for generating abrasive blasts non-mechanically, e.g. of metallic abrasives by means of a magnetic field
- 7/00 **Equipment for feeding abrasive material; Controlling the flowability, constitution, or other physical characteristics of abrasive blasts**
- 9/00 **Appurtenances of abrasive blasting machines or devices, e.g. working chambers, arrangements for handling used abrasive material**
- 11/00 **Selection of abrasive materials for abrasive blasts (polishing compositions C09G)**

**B24D TOOLS FOR GRINDING, BUFFING, OR SHARPENING** (tools for grinding or polishing optical surfaces on lenses or surfaces of similar shape B24B 13/01; grinding heads B24B 41/00; manufacture of abrasive or friction articles or shaped materials containing macromolecular substances C08J 5/14; polishing compositions C09G 1/00; abrasives C09K 3/14)

#### Note(s)

1. This subclass covers grinding tools for working on any material.
2. Tools for grinding, buffing or sharpening, specially designed for a particular purpose, which purpose is provided for in a single other place, are classified in that place, e.g. B23F 21/02.

#### Subclass index

PHYSICAL FEATURES OR CONSTITUENTS OF ABRASIVE BODIES OR SHEETS.....	3/00
ABRASIVE WHEELS.....	5/00, 7/00, 9/00, 13/00
FLEXIBLE ABRASIVE MATERIALS.....	11/00
HAND TOOLS.....	15/00
MANUFACTURE.....	18/00
OTHER TOOLS.....	99/00

#### **3/00 Physical features of abrasive bodies, or sheets, e.g. abrasive surfaces of special nature; Abrasive bodies or sheets characterised by their constituents** (composition of friction linings F16D 69/02)

- 3/02 • the constituent being used as bonding agent
- 3/04 • • and being essentially inorganic
- 3/06 • • • metallic
- 3/08 • • • • for close-grained structure, e.g. using metal with low melting point
- 3/10 • • • • for porous or cellular structure, e.g. for use with diamonds as abrasives
- 3/12 • • • • water-setting, e.g. concrete
- 3/14 • • • • ceramic, i.e. vitrified bondings
- 3/16 • • • • for close grained structure, i.e. of high density
- 3/18 • • • • for porous or cellular structure
- 3/20 • • and being essentially organic
- 3/22 • • • Rubbers
- 3/24 • • • • for close-grained structure
- 3/26 • • • • for porous or cellular structure
- 3/28 • • • Resins
- 3/30 • • • • for close-grained structure

- 3/32 • • • • for porous or cellular structure
- 3/34 • characterised by additives enhancing special physical properties, e.g. wear resistance, electric conductivity, self-cleaning properties

#### Bonded abrasive wheels

- 5/00 **Bonded abrasive wheels, or wheels with inserted abrasive blocks, designed for acting only by their periphery; Bushings or mountings therefor**
- 5/02 • Wheels in one piece
- 5/04 • • with reinforcing means
- 5/06 • with inserted abrasive blocks, e.g. segmental (zonally graded B24D 5/14)
- 5/08 • • with reinforcing means
- 5/10 • with cooling provisions, e.g. with radial slots
- 5/12 • Cut-off wheels
- 5/14 • Zonally-graded wheels; Composite wheels comprising different abrasives
- 5/16 • Bushings; Mountings

## B24D

7/00	<b>Bonded abrasive wheels, or wheels with inserted abrasive blocks, designed for acting otherwise than only by their periphery, e.g. by the front face; Bushings or mountings therefor</b>	11/04	• Zonally-graded surfaces
7/02	• Wheels in one piece	11/06	• Connecting the ends of materials, e.g. for making abrasive belts
7/04	• • with reinforcing means	11/08	• Equipment for after-treatment of the coated backings, e.g. for flexing the coating
7/06	• with inserted abrasive blocks, e.g. segmental (zonally-graded B24D 7/14)	13/00	<b>Wheels having flexibly-acting working parts, e.g. buffing wheels; Mountings therefor</b>
7/08	• • with reinforcing means	13/02	• acting by their periphery
7/10	• with cooling provisions	13/04	• • comprising a plurality of flaps or strips arranged around the axis
7/12	• with apertures for inspecting the surface to be abraded	13/06	• • the flaps or strips being individually attached
7/14	• Zonally-graded wheels; Composite wheels comprising different abrasives	13/08	• • comprising annular or circular sheets packed side by side
7/16	• Bushings; Mountings	13/10	• • comprising assemblies of brushes
7/18	• Wheels of special form (if specially designed for a particular purpose provided for in a single other class, that class takes precedence)	13/12	• • comprising assemblies of felted or spongy material, e.g. felt, steel wool, foamed latex
<hr/>		13/14	• acting by the front face
9/00	<b>Wheels or drums supporting in exchangeable arrangement a layer of flexible abrasive material, e.g. sandpaper</b> (wheels or drums as machine elements F16)	13/16	• • comprising pleated flaps or strips
9/02	• Expansible drums for carrying flexible material in tubular form, e.g. expanded by centrifugal force	13/18	• with cooling provisions
9/04	• Rigid drums for carrying flexible material	13/20	• Mountings for the wheels
9/06	• • able to be stripped-off from a built-in delivery spool	15/00	<b>Hand tools or other devices for non-rotary grinding, polishing, or stropping</b>
9/08	• Circular back-plates for carrying flexible material	15/02	• rigid; with rigidly-supported operative surface
9/10	• • with suction means for securing the material	15/04	• resilient; with resiliently-mounted operative surface
11/00	<b>Constructional features of flexible abrasive materials; Special features in the manufacture of such materials</b>	15/06	• specially designed for sharpening cutting edges
11/02	• Backings, e.g. foils, webs, mesh fabrics	15/08	• • of knives; of razors
		15/10	• • of safety-razor blades (devices with mechanically-operated parts B24B 3/50)
		18/00	<b>Manufacture of grinding tools, e.g. wheels, not otherwise provided for [4]</b>
		99/00	<b>Subject matter not provided for in other groups of this subclass [2010.01]</b>

## B25 HAND TOOLS; PORTABLE POWER-DRIVEN TOOLS; HANDLES FOR HAND IMPLEMENTS; WORKSHOP EQUIPMENT; MANIPULATORS

### Note(s)

In this class, the following term is used with the meaning indicated:

- "portable" includes suspension for easy manual handling, e.g. in connection with spring-suspended portable apparatus for use along assembly lines.

## B25B TOOLS OR BENCH DEVICES NOT OTHERWISE PROVIDED FOR, FOR FASTENING, CONNECTING, DISENGAGING, OR HOLDING

### Note(s)

This subclass covers hand tools for fastening, connecting, disengaging, or holding, which are not covered by another subclass such as B25C (hand-held nailing or stapling tools) or by an application place such as B21F (working of wire) or B65B (packaging).

### Subclass index

#### DEVICES FOR HOLDING BY PRESSING

Vices.....	1/00, 3/00
Pliers, tweezers or tongs.....	7/00, 9/00
Other devices.....	5/00-11/00

#### SPANNERS, WRENCHES, OR SCREWDRIVERS

Spanners or wrenches.....	13/00, 17/00-21/00
Screwdrivers.....	15/00-21/00
Details or accessories.....	23/00

OTHER TOOLS FOR FASTENING, CONNECTING, FITTING TOGETHER, SEPARATING, OR TENSIONING.....	25/00-28/00, 31/00, 33/00
ACCESSORIES.....	29/00

1/00	<b>Vices</b> (specially adapted for tying flies for angling A01K 97/28; specially adapted for machine tools B23Q 3/00) [5]	7/22	• Pliers provided with auxiliary tool elements, e.g. cutting edges, nail extractors (for removing insulation or armouring from electric cables H02G 1/12)
1/02	• with sliding jaws	9/00	<b>Hand-held gripping tools other than those covered by group B25B 7/00</b> (wrenches B25B 13/00; specially adapted for watchmakers' or like use G04D)
1/04	• with pivoted jaws	9/02	• without sliding or pivotal connections, e.g. tweezers, one-piece tongs
1/06	• Arrangements for positively actuating jaws	9/04	• with sliding jaws
1/08	• • using cams	11/00	<b>Work holders or positioners not covered by groups B25B 1/00-B25B 9/00, e.g. magnetic work holders, vacuum work holders</b> (for holding or positioning work for welding, soldering, or cutting by applying heat locally B23K 37/04; specially adapted to machine tools B23Q 3/00)
1/10	• • using screws	11/02	• Assembly jigs
1/12	• • • with provision for disengagement	13/00	<b>Spanners; Wrenches</b> (hand-driven gear-operated B25B 17/00; impact wrenches B25B 19/00; portable power-driven B25B 21/00; machines for fitting together or separating metal parts B23P 19/00)
1/14	• • using toggle links	13/02	• with rigid jaws (B25B 13/46, B25B 13/48 take precedence)
1/16	• • by pedal, with or without provision for additional manual actuation	13/04	• • of ring jaw type
1/18	• • motor driven, e.g. with fluid drive, with or without provision for manual actuation	13/06	• • of socket type
1/20	• Vices for clamping work of special profile, e.g. pipes	13/08	• • of open jaw type
1/22	• Arrangements for turning or tilting vices	13/10	• with adjustable jaws (B25B 13/46, B25B 13/48 take precedence)
1/24	• Details, e.g. jaws of special shape, slideways	13/12	• • the jaws being slidable
3/00	<b>Hand vices, i.e. vices intended to be held by hand; Pin vices</b>	13/14	• • • by rack and pinion, worm or gear
5/00	<b>Clamps</b> (for holding or positioning work for welding, soldering, or cutting by applying heat locally B23K 37/04; work-clamping means for mounting on a work-table, tool-slide, or analogous parts B23Q 3/06)	13/16	• • • by screw or nut
5/02	• with sliding jaws	13/18	• • • by cam, wedge, or lever
5/04	• with pivoted jaws	13/20	• • • Arrangements for locking the jaws
5/06	• Arrangements for positively actuating jaws	13/22	• • • • by ratchet action or toothed bars
5/08	• • using cams	13/24	• • • • by cam, wedge, or friction means
5/10	• • using screws	13/26	• • • • by toggle links
5/12	• • using toggle links	13/28	• • the jaws being pivotally movable
5/14	• Clamps for work of special profile	13/30	• • • by screw or nut
5/16	• Details, e.g. jaws, jaw attachments	13/32	• • • by cam, wedge, or lever
7/00	<b>Pliers; Other hand-held gripping tools with jaws on pivoted limbs; Details applicable generally to pivoted-limb hand tools</b> (implements for fastening, connecting, or tensioning wire or strip B25B 25/00; adapted for other fitting or separating purposes B25B 27/00; for marking animals A01K 11/00; dentists' forceps A61C 3/00; bending wire eyes B21F 1/06; hand-held metal-shearing or metal-cutting devices B23D 29/00; hand cutting tools B26B; for punching or perforating B26F 1/36; devices for securing ends of binding material in bundling machines B65B 13/24; specially designed for watch-making or comparable work G04D 1/00)	13/34	• • • Arrangements for locking the jaws
7/02	• Jaws	13/36	• • • • by ratchet action
7/04	• • adjustable	13/38	• • • • by cam, wedge, or friction means
7/06	• Joints	13/40	• • • • by toggle links
7/08	• • with fixed fulcrum	13/42	• • • • with self-locking action
7/10	• • with adjustable fulcrum	13/44	• of the chuck type
7/12	• involving special transmission means between the handles and the jaws, e.g. toggle levers, gears	13/46	• of the ratchet type, for providing a free return stroke of the handle
7/14	• Locking means	13/48	• for special purposes
7/16	• • combined with means for tightening the operating arms or jaws	13/50	• • for operating on work of special profile, e.g. pipes
7/18	• Adjusting means for the operating arms	13/52	• • • Chain or strap wrenches
7/20	• Pliers for sealing	13/54	• • • Internal grip wrenches
		13/56	• Spanner sets
		13/58	• Jaw attachments
		15/00	<b>Screwdrivers</b> (hand-driven gear-operated B25B 17/00; impact screwdrivers B25B 19/00; portable power-driven B25B 21/00)
		15/02	• operated by rotating the handle

## B25B

- 15/04 • • with ratchet action
- 15/06 • operated by axial movement of the handle
- 17/00 Hand-driven gear-operated wrenches or screwdrivers** (ratchet operated B25B 13/46, B25B 15/04)
- 17/02 • providing for torque amplification
- 19/00 Impact wrenches or screwdrivers** (portable power-driven B25B 21/02)
- 21/00 Portable power-driven screw or nut setting or loosening tools** (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00); **Attachments for drilling apparatus serving the same purpose** (machines B23P 19/06) [4]
- 21/02 • with means for imparting impact to screwdriver blade or nut socket
- 23/00 Details of, or accessories for, spanners, wrenches, screwdrivers** (bolt tensioners B25B 29/02)
- 23/02 • Arrangements for handling screws or nuts
- 23/04 • • for feeding screws or nuts
- 23/06 • • • using built-in magazine
- 23/08 • • for holding or positioning screw or nut prior to or during its rotation
- 23/10 • • • using mechanical gripping means
- 23/12 • • • using magnetic means
- 23/14 • Arrangement of torque limiters or torque indicators in wrenches or screwdrivers (couplings for transmitting rotation or clutches F16D; devices for measuring torque *per se* G01L)
- 23/142 • • specially adapted for hand operated wrenches or screwdrivers [2]
- 23/143 • • • wherein the work-contacting component pivots or rotates relative to the handle when a selected torque is exceeded [4]
- 23/144 • • • • having an electrical device activated by the pivotal or rotational movement which emits a signal when the selected torque is exceeded [4]
- 23/145 • • specially adapted for fluid operated wrenches or screwdrivers [2]
- 23/147 • • specially adapted for electrically operated wrenches or screwdrivers [2]
- 23/15 • • having a mechanism to mark the work when the selected torque is applied to the work [4]
- 23/151 • • the motor drive having condition-responsive means to regulate the power output of a motor driving the work-contacting component (control in general G05; controlling electric motors H02P) [4]
- 23/153 • • having a force-transmitting element which is permanently deformed upon application of an excessive amount of torque [4]
- 23/155 • • wherein the work-contacting means is released from torque-transmitting engagement with the work, when a selected torque is exceeded (B25B 23/153 takes precedence) [4]
- 23/157 • • having torque controlled clutch-type arrangements (B25B 23/143 takes precedence) [4]
- 23/159 • • the work-contacting component comprising or being connected to a resilient structural member, which remains rigid and fully force transmitting until a selected torque is exceeded or which signals excessive torque (B25B 23/153 takes precedence) [4]
- 23/16 • Handles (in general B25G)
- 23/18 • Devices for illuminating the head of the screw or the nut
- 25/00 Implements for fastening, connecting, or tensioning of wire or strip** (bundling articles B65B 13/00)
- 27/00 Hand tools or bench devices, specially adapted for fitting together or separating parts or objects whether or not involving some deformation, not otherwise provided for** (machines for simply fitting together or separating metal parts or objects B23P 19/00)
- 27/02 • for connecting objects by press fit or detaching same
- 27/04 • • inserting or withdrawing keys
- 27/06 • • inserting or withdrawing sleeves or bearing races
- 27/067 • • • employing wedging or impacting means [3]
- 27/073 • • • employing screw and nut means [3]
- 27/08 • • inserting or withdrawing cotter pins
- 27/10 • • inserting fittings into hoses
- 27/12 • • mounting or demounting piston rings
- 27/14 • for assembling objects other than by press fit or detaching same
- 27/16 • • abutted flanges
- 27/18 • • withdrawing broken threaded parts or twist drills
- 27/20 • • inserting or withdrawing split pins or circlips
- 27/22 • • positioning sprocket chains, endless tracks, antiskid chains (tools or implements for repairing chains using metal-working operations B21L 21/00)
- 27/24 • • mounting or demounting valves (for tyre valves B60C 25/18)
- 27/26 • • • compressing the springs
- 27/28 • • positioning or withdrawing resilient bushings or the like [3]
- 27/30 • • positioning or withdrawing springs, e.g. coil or leaf springs (B25B 27/26 takes precedence; watchmakers' or watch-repairers' tools G04D) [3]
- 28/00 Portable power-driven joining or separation tools** (B25B 21/00 takes precedence) [3]
- 29/00 Accessories** (specially for spanners, wrenches, screwdrivers B25B 23/00; tool boxes, tool positioning stands B25H)
- 29/02 • Bolt tensioners
- 31/00 Hand tools for applying fasteners** (nailing or stapling tools B25C) [3]
- 33/00 Hand tools not covered by any other group in this subclass** [3]

**B25C HAND-HELD NAILING OR STAPLING TOOLS; MANUALLY-OPERATED PORTABLE STAPLING TOOLS**  
(manufacturing footwear A43D)

**Note(s)**

- In this subclass, the following term is used with the meaning indicated:
  - "nail" includes pin, bolt, stud, plug or the like.
- Tools for driving both nails or staples are classified with the nailing tools.

**Subclass index**

JOINING BY NAILS

Nailing punches.....	9/00
Nailing tools.....	1/00, 3/00, 7/00
Tools for straightening or extracting nails.....	13/00, 11/00

JOINING BY STAPLES.....5/00, 7/00, 11/00

<b>1/00 Hand-held nailing tools</b> (hammers B25D; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00; nailing machines B27F 7/02); <b>Nail feeding devices therefor [4]</b>	<b>5/00 Manually operated portable stapling tools; Hand-held power-operated stapling tools</b> (surgical staplers A61B 17/068, A61B 17/115; details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00; stapling machines B27F 7/17); <b>Staple feeding devices therefor</b> (surgical staples A61B 17/064; staples F16B 15/00) <b>[3, 4, 5]</b>
1/02 • operated by manual power <b>[3]</b>	5/02 • with provision for bending the ends of the staples on to the work
1/04 • operated by fluid pressure <b>[3]</b>	5/04 • • with means for forming the staples in the tool
1/06 • operated by electric power	5/06 • without provision for bending the ends of the staples on to the work
1/08 • operated by combustion pressure	5/08 • • with means for forming the staples in the tool
1/10 • • generated by detonation of a cartridge	5/10 • Driving means
1/12 • • • acting directly on the nail	5/11 • • operated by manual power <b>[3]</b>
1/14 • • • acting on an intermediate plunger or anvil (pistols for slaughtering or stunning animals A22B 3/02)	5/13 • • operated by fluid pressure <b>[3]</b>
1/16 • • • Cartridges specially adapted for impact tools; Cartridge-and-nail units (bolts or the like for shooting into concrete constructions, metal walls, or the like by means of detonation-operated nailing tools F16B 19/14)	5/15 • • operated by electric power <b>[3]</b>
1/18 • • • Details or accessories, e.g. splinter guards, spall minimisers	5/16 • Staple-feeding devices
<b>3/00 Portable devices for holding and guiding nails; Nail dispensers</b>	<b>7/00 Accessories for nailing or stapling tools, e.g. supports</b> (for tools operated by detonation of a cartridge B25C 1/18)
	<b>9/00 Nail punches</b>
	<b>11/00 Nail, spike, or staple extractors</b> (incorporated in hammers B25D 1/00)
	11/02 • Pincers (joints therefor B25B 7/06)
	<b>13/00 Nail straightening devices</b>

**B25D PERCUSSIVE TOOLS** (percussive machines for forging B21J; hand-held drilling machines, in general B23B 45/00, for wood B27C 3/08; percussion drilling of earth or rock E21B) **[2]**

**Subclass index**

TOOLS DISTINGUISHED BY OPERATIVE METHOD.....	9/00-16/00
HAMMERS, CHISELS, PUNCHES, OR PICKS.....	1/00-7/00
DETAILS OR ACCESSORIES.....	17/00

<b>1/00 Hand hammers; Hammer heads of special shape or materials</b>	1/02 • Inserts or attachments forming the striking part of hammer heads (B25D 1/08-B25D 1/14 take precedence) <b>[5]</b>
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## B25D

- 1/04 • with provision for withdrawing or holding nails or spikes
- 1/06 • • Magnetic holders [5]
- 1/08 • having deformable heads (B25D 1/12 takes precedence) [5]
- 1/10 • having work protector surrounding faces (B25D 1/12 takes precedence) [5]
- 1/12 • having shock-absorbing means [5]
- 1/14 • having plural striking faces [5]
- 1/16 • having the impacting head in the form of a sleeve slidable on a shaft, e.g. hammers for driving a valve or draw-off tube into a barrel [5]

**3/00 Hand chisels** (mortise chisels B27G 17/08)

**5/00 Centre punches**

- 5/02 • Automatic centre punches

**7/00 Picks** (combined with other tools B25F)

**9/00 Portable percussive tools with fluid-pressure drive, e.g. having several percussive tool bits operated simultaneously** (centrifugal or rotary impact type B25D 15/00; portable non-percussive drilling tools driven by fluid pressure or pneumatic power B23B 45/04)

- 9/02 • of the tool-carrier piston type, i.e. in which the tool is connected to an impulse member
- 9/04 • of the hammer piston type, i.e. in which the tool bit or anvil is hit by an impulse member
- 9/06 • Means for driving the impulse member
- 9/08 • • comprising a built-in air compressor
- 9/10 • • comprising a built-in internal-combustion engine
- 9/11 • • operated by combustion pressure generated by detonation of a cartridge
- 9/12 • • comprising a built-in liquid motor
- 9/14 • Control devices for the reciprocating piston
- 9/16 • • Valve arrangements therefor
- 9/18 • • • involving a piston-type slide valve
- 9/20 • • • involving a tubular-type slide valve
- 9/22 • • • involving a rotary-type slide valve
- 9/24 • • • involving a rocking-plate type valve
- 9/26 • • Control devices for adjusting the stroke of the piston or the force or frequency of impact thereof

**11/00 Portable percussive tools with electromotor drive** (centrifugal or rotary impact type B25D 15/00)

- 11/02 • in which the tool is connected to an impulse member
- 11/04 • in which the tool bit or anvil is hit by an impulse member
- 11/06 • Means for driving the impulse member
- 11/08 • • comprising a worm mechanism
- 11/10 • • comprising a cam mechanism
- 11/12 • • comprising a crank mechanism

**13/00 Portable percussive tools with electromagnetic drive** (B25D 15/00 takes precedence)

**15/00 Portable percussive tools using centrifugal or rotary impact elements**

- 15/02 • in which the tool bit or anvil is hit by a rotary impulse member

**16/00 Portable percussive machines with superimposed rotation** (portable drilling machines with superimposed percussive action B23B 45/16) [3]

**17/00 Details of, or accessories for, portable power-driven percussive tools** (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]

- 17/02 • Percussive tool bits (drill bits for earth drilling E21B 10/00)
- 17/04 • Handles; Handle mountings
- 17/06 • Hammer pistons; Anvils
- 17/08 • Means for retaining and guiding the tool bit, e.g. chucks
- 17/10 • Safety devices (in general F16P)
- 17/11 • Arrangements of noise damping means (noise damping in general G10K 11/16) [3]
- 17/12 • • of exhaust silencers [3]
- 17/14 • Removing or laying dust (flushing boreholes while drilling earth or rock E21B 21/00)
- 17/16 • • by liquid
- 17/18 • • by exhausting dust-loaded air
- 17/20 • Devices for cleaning or cooling tool or work
- 17/22 • • using pressure fluid
- 17/24 • Damping the reaction force
- 17/26 • Lubricating (in general F16N)
- 17/28 • Supports; Devices for holding power-driven percussive tools in working position
- 17/30 • • Pillars and struts
- 17/32 • • Trolleys

**B25F COMBINATION OR MULTI-PURPOSE TOOLS NOT OTHERWISE PROVIDED FOR; DETAILS OR COMPONENTS OF PORTABLE POWER-DRIVEN TOOLS NOT PARTICULARLY RELATED TO THE OPERATIONS PERFORMED AND NOT OTHERWISE PROVIDED FOR [4]**

### Note(s)

This subclass does not cover tools having a clear primary function as well as one or more secondary functions. Those tools are covered by the relevant subclass for tools having such primary function and are, thus, not classified in group B25F 1/00 or B25F 3/00 of this subclass.

**1/00 Combination or multi-purpose hand tools** (associations of tools for different working operations with one portable power-drive means B25F 3/00)

- 1/02 • with interchangeable or adjustable tool elements
- 1/04 • • wherein the elements are brought into working position by a pivoting or sliding movement

**3/00 Associations of tools for different working operations with one portable power-drive means; Adapters therefor**

**5/00 Details or components of portable power-driven tools not particularly related to the operations performed and not otherwise provided for [4]**

- 5/02 • Construction of casings, bodies or handles [4]

**B25G HANDLES FOR HAND IMPLEMENTS** (attaching the blades or the like to handles of hand tools for soil working A01B 1/22; handles of hand implements for harvesting A01D 1/14; handles integral with brushware A46B)

**Note(s)**

1. This subclass covers:
  - handles for hand implements, in general;
  - handles for hand implements for particular purposes, subject to Note (2) below.
2. This subclass does not cover handles provided for elsewhere, e.g. it does not cover those provided for in A45B 9/02, A45C 13/22, A45C 13/26, A47B 95/02, A47J 45/00, B23D 51/01, B25J 13/02, B26B, B60N 3/02, B62B 5/06, B62B 9/20, B62K 21/26, B62M 3/14, B65D 25/28, E05B, G05G.

**1/00 Handle constructions**

- 1/01 • Shock-absorbing means (B25G 1/02 takes precedence) [5]
- 1/02 • flexible (hammers heads having shock-absorbing means B25D 1/12) [5]
- 1/04 • telescopic; extensible; sectional
- 1/06 • reversible or adjustable for position
- 1/08 • with provision for storing tool elements
- 1/10 • characterised by material or shape (B25G 1/01, B25G 1/02 take precedence) [5]
- 1/12 • • electrically insulating material [2]

**3/00 Attaching handles to the implements**

- 3/02 • Socket, tang, or like fixings (B25G 3/34 takes precedence)
- 3/04 • • with detachable or separate socket pieces (B25G 3/12 takes precedence)
- 3/06 • • with multiple socket, e.g. T-socket (B25G 3/12 takes precedence)
- 3/08 • • with dovetail or other groove (B25G 3/12 takes precedence)
- 3/10 • • with elastic, taper, or other self-grip socket or tang (B25G 3/12 takes precedence)

- 3/12 • • Locking or securing devices
- 3/14 • • • comprising barbs or teeth
- 3/16 • • • comprising bayonet joints
- 3/18 • • • comprising catches or pawls
- 3/20 • • • comprising clamping or contracting means acting concentrically on the handle or socket
- 3/22 • • • • Chucks
- 3/24 • • • comprising clamping or contracting means acting transversely on the handle or socket
- 3/26 • • • comprising nails, screws, bolts, or pins traversing or entering the socket
- 3/28 • • • comprising wedges, keys, or like expanding means
- 3/30 • • • comprising screwed sockets or tangs
- 3/32 • • • in association with, or including, tang, bolt, or other member passing axially through whole length of handle
- 3/34 • by pressing the handle on the implements; using cement or molten metal, e.g. casting, moulding; by welding or the like
- 3/36 • Lap joints; Riveted, screwed, or like joints (socket, tang, or like fixings B25G 3/02)
- 3/38 • Hinged, pivoted, swivelling, or folding joints

**B25H WORKSHOP EQUIPMENT, e.g. FOR MARKING-OUT WORK; STORAGE MEANS FOR WORKSHOPS** (storing or packaging B65)

**1/00 Work benches; Portable stands or supports for positioning portable tools or work to be operated on thereby**

- 1/02 • of table type
- 1/04 • • portable
- 1/06 • of trestle type
- 1/08 • with provision for attachment of work holders
- 1/10 • with provision for adjusting holders for tool or work
- 1/12 • with storage compartments
- 1/14 • with provision for adjusting the bench top
- 1/16 • • in height
- 1/18 • • in inclination
- 1/20 • with provision for shielding the work area

**3/00 Storage means or arrangements for workshops facilitating access to, or handling of, work, tools or instruments** (containers or packages with special means for dispensing contents B65D 83/00)

- 3/02 • Boxes
- 3/04 • Racks
- 3/06 • Trays

**5/00 Tool, instrument or work supports or storage means used in association with vehicles** (means for holding wheels or parts thereof B60B 30/00); **Workers' supports, e.g. mechanics' creepers**

**7/00 Marking-out or setting-out work** (measuring, gauging G01; optical apparatus G02B; by photographic means G03C)

- 7/02 • Plates having a flat surface
- 7/04 • Devices, e.g. scribes, for marking (centre punches B25D 5/00)

**B25J MANIPULATORS; CHAMBERS PROVIDED WITH MANIPULATION DEVICES** (robotic devices for individually picking fruits, vegetables, hops or the like A01D 46/30; needle manipulators for surgery A61B 17/062; manipulators associated with rolling mills B21B 39/20; manipulators associated with forging machines B21J 13/10; means for holding wheels or parts thereof B60B 30/00; cranes B66C; arrangements for handling fuel or other materials which are used within nuclear reactors G21C 19/00; structural combination of manipulators with cells or rooms shielded against radiation G21F 7/06) [5]

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "manipulator" covers handling tools, devices, or machines having a gripping or work head capable of bodily movement in space and of change of orientation, such bodily movement and change of orientation being controlled by means remote from the head, e.g. programme-controlled industrial robots.

### Subclass index

KINDS OR TYPES OF MANIPULATORS.....	1/00, 3/00
MANIPULATORS MOUNTED ON WHEELS OR VEHICLES.....	5/00
MICROMANIPULATORS.....	7/00
PROGRAMME-CONTROLLED MANIPULATORS.....	9/00
OTHER MANIPULATORS, GLOVE-BOXES.....	11/00, 21/00
CONTROL.....	13/00
GRIPPING HEADS, JOINTS, ARMS.....	15/00, 17/00, 18/00
ACCESSORIES; SAFETY.....	19/00

**1/00 Manipulators positioned in space by hand** (of master-slave type B25J 3/00; micromanipulators B25J 7/00)

- 1/02 • articulated or flexible
- 1/04 • rigid, e.g. shelf-reachers
- 1/06 • of the lazy-tongs type
- 1/08 • movably mounted in a wall
- 1/10 • • Sleeve and pivot mountings therefor
- 1/12 • having means for attachment to a support stand

**3/00 Manipulators of master-slave type, i.e. both controlling unit and controlled unit perform corresponding spatial movements**

- 3/02 • involving a parallelogram coupling of the master and slave units (pantographic instruments B43L 13/00)
- 3/04 • involving servo mechanisms (servo-actuated heads B25J 15/02)

**5/00 Manipulators mounted on wheels or on carriages** (B25J 1/00 takes precedence; programme-controlled manipulators B25J 9/00)

- 5/02 • travelling along a guideway
- 5/04 • • wherein the guideway is also moved, e.g. travelling crane bridge type
- 5/06 • Manipulators combined with a control cab for the operator

**7/00 Micromanipulators**

**9/00 Programme-controlled manipulators**

- 9/02 • characterised by movement of the arms, e.g. cartesian co-ordinate type (B25J 9/06 takes precedence) [4]
- 9/04 • • by rotating at least one arm, excluding the head movement itself, e.g. cylindrical co-ordinate type or polar co-ordinate type [4]
- 9/06 • characterised by multi-articulated arms [4]
- 9/08 • characterised by modular constructions [4]
- 9/10 • characterised by positioning means for manipulator elements [4]
- 9/12 • • electric [4]
- 9/14 • • fluid [4]

9/16 • Programme controls (total factory control, i.e. centrally controlling a plurality of machines, G05B 19/418) [4]

9/18 • • electric [4]

9/20 • • fluidic [4]

9/22 • • Recording or playback systems (in general G05B 19/42) [4]

**11/00 Manipulators not otherwise provided for**

**13/00 Controls for manipulators** (programme controls B25J 9/16) [4]

- 13/02 • Hand grip control means
- 13/04 • Foot-operated control means
- 13/06 • Control stands, e.g. consoles, switchboards
- 13/08 • by means of sensing devices, e.g. viewing or touching devices [4]

**15/00 Gripping heads**

- 15/02 • servo-actuated
- 15/04 • with provision for the remote detachment or exchange of the head or parts thereof
- 15/06 • with vacuum or magnetic holding means
- 15/08 • having finger members (B25J 15/02, B25J 15/04 take precedence) [4]
- 15/10 • • with three or more finger members [4]
- 15/12 • • with flexible finger members [4]

**17/00 Joints**

- 17/02 • Wrist joints

**18/00 Arms** [4]

- 18/02 • extensible [4]
- 18/04 • • rotatable [4]
- 18/06 • flexible [4]

**19/00 Accessories fitted to manipulators, e.g. for monitoring, for viewing; Safety devices combined with or specially adapted for use in connection with manipulators** (safety devices in general F16P; protection against radiation in general G21F)



- 19/02 • Sensing devices [4]
- 19/04 • • Viewing devices [4]
- 19/06 • Safety devices [4]

- 21/00 Chambers provided with manipulation devices**  
(constructional features of the mounting of the manipulator in the wall B25J 1/08)
- 21/02 • Glove-boxes, i.e. chambers in which manipulations are performed by the human hands in gloves built into the chamber walls; Gloves therefor

## B26 HAND CUTTING TOOLS; CUTTING; SEVERING

**B26B HAND-HELD CUTTING TOOLS NOT OTHERWISE PROVIDED FOR** (for harvesting A01D; for horticulture, for forestry A01G; for butchering or meat treatment A22; for manufacturing or repairing footwear A43D; nail clippers or cutters A45D 29/02; kitchen equipment A47J; for surgical purposes A61B 17/00; for metal B23D; cutting by abrasive fluid jets B24C 5/02; plier-like tools with cutting edges B25B 7/22; pincers B25C 11/02; handles for hand implements, in general B25G; guillotine-type cutters B26D; for erasing B43L 19/00; for textile materials D06H)

### Subclass index

#### KNIVES

Structural features.....	1/00-7/00
Knife blades.....	9/00
Combinations with other articles.....	11/00
SHEARS, SCISSORS, NIPPERS, OR PINCERS WITH CUTTING ACTION.....	13/00, 15/00, 17/00
CLIPPERS OR RAZORS.....	19/00, 21/00
AXES OR HATCHETS.....	23/00
OTHER CUTTING TOOLS.....	25/00, 27/00
GUARDS, SHEATHS OR GUIDING ARRANGEMENTS.....	29/00

#### Hand knives

- 1/00 Hand knives with adjustable blade; Pocket knives**  
(B26B 11/00 takes precedence)
  - 1/02 • with pivoted blade
  - 1/04 • • lockable in adjusted position
  - 1/06 • • with loosely-inserted spring
  - 1/08 • with sliding blade
  - 1/10 • Handles [3]
- 3/00 Hand knives with fixed blades**
  - 3/02 • Table-knives (B26B 9/02 takes precedence)
  - 3/03 • specially adapted for cutting-off slices one by one
  - 3/04 • for performing several incisions simultaneously;  
Multiple-blade knives
  - 3/06 • Scout or similar sheath knives (sheaths therefor  
B26B 29/02)
  - 3/08 • specially adapted for cutting cardboard, or wall, floor,  
or like covering materials
- 5/00 Hand knives with one or more detachable blades**  
(surgical scalpels or knives with detachable blades  
A61B 17/3213)
- 7/00 Hand knives with reciprocating motor-driven blades**
- 9/00 Blades for hand knives**
  - 9/02 • characterised by the shape of the cutting edge, e.g.  
wavy
- 11/00 Hand knives combined with other implements, e.g.  
with corkscrew, with scissors, with writing  
implement** (combined table-ware A47G 21/06)

#### Hand shears; Scissors

- 13/00 Hand shears; Scissors**
    - 13/02 • with moulded-in blades
    - 13/04 • with detachable blades
    - 13/06 • characterised by the shape of the blades
    - 13/08 • • with cutting edges wavy or toothed in the plane of  
the blade
    - 13/10 • • for producing wavy, zig-zag, or like cuts
    - 13/12 • characterised by the shape of the handles
    - 13/14 • • without gripping bows in the handle
    - 13/16 • • • spring loaded, e.g. with provision for locking  
the blades or the handles
    - 13/18 • • • without joint, i.e. having blades interconnected  
by a resilient member
    - 13/20 • • with gripping bows in the handle
    - 13/22 • combined with auxiliary implements, e.g. with cigar  
cutter, with manicure instrument (cigar cutters per se  
A24F 13/24)
    - 13/24 • • to aid hair cutting
    - 13/26 • with intermediate links between the grips and the  
blades, e.g. for remote actuation
    - 13/28 • Joints (B25B 7/06 takes precedence)
  - 15/00 Hand-held shears with motor-driven blades**
- 
- 17/00 Hand cutting tools with two jaws which come into  
abutting contact** (nail clippers or cutters A45D 29/02;  
joints therefor B25B 7/06)
  - 17/02 • with jaws operated indirectly by the handles, e.g.  
through cams or toggle levers

<b>19/00</b>	<b>Clippers or shavers operating with a plurality of cutting edges, e.g. hair clippers, dry shavers</b>	21/06	• • Safety razors with fixed blade, e.g. with moulded-in blade
19/02	• of the reciprocating-cutter type	21/08	• involving changeable blades
19/04	• • Cutting heads therefor; Cutters therefor; Securing equipment thereof	21/10	• • Safety razors with one or more blades arranged longitudinally to the handle
19/06	• • • involving co-operating cutting elements both of which have shearing teeth	21/12	• • • combined with combs or other means for hair trimming
19/08	• • • • of nipper type	21/14	• • Safety razors with one or more blades arranged transversely to the handle
19/10	• • • involving two or more different types of reciprocating cutting elements, e.g. a pair of toothed shearing elements combined with a pair of perforated cutting elements or a combined toothed and perforated cutting assembly	21/16	• • • involving blades with only one cutting edge (B26B 21/22-B26B 21/38 take precedence)
19/12	• of the oscillating-cutter type; Cutting heads therefor; Cutters therefor (B26B 19/04 takes precedence)	21/18	• • • involving blades with two cutting edges (B26B 21/22-B26B 21/38 take precedence)
19/14	• of the rotary-cutter type; Cutting heads therefor; Cutters therefor (B26B 19/04 takes precedence)	21/20	• • • involving blades with more than two cutting edges; involving disc blades (B26B 21/22-B26B 21/38 take precedence)
19/16	• • involving a knife cylinder or a knife cone or separate cutting elements moved like a rotating cylinder or a rotating cone	21/22	• • • involving several blades to be used simultaneously
19/18	• • • in combination with a fixed razor-blade without shearing perforations	21/24	• • • of the magazine type; of the injector type (containers for storing razor-blades A45D 27/24)
19/20	• with provision for shearing hair of preselected or variable length	21/26	• • • of the continuous ribbon type
19/22	• with provision for thinning-out hair	21/28	• • • of the drawing cut type, i.e. with the cutting edge of the blade arranged obliquely to the handle
19/24	• specially adapted for shearing animals, e.g. sheep	21/30	• • • of the type carrying pivotally-mounted caps
19/26	• of the type performing different methods of operation simultaneously, e.g. reciprocating and oscillating; of the type having two or more heads of differing mode of operation	21/32	• • • • in razors involving double-edged blades
19/28	• Drive layout for hair clippers or dry shavers, e.g. providing for electromotive drive (electric motors <u>per se</u> H02)	21/34	• • • of the type carrying rollers
19/30	• • providing for muscle drive, e.g. by rolling over the skin	21/36	• • • • with provision for reciprocating the blade (reciprocating the cutting elements of clippers or dry shavers B26B 19/00)
19/32	• • providing for mechanical drive, e.g. installation of a spring motor	21/38	• • • with provision for reciprocating the blade by means other than rollers (reciprocating the cutting elements of clippers or dry shavers B26B 19/00)
19/34	• • providing for fluid drive	21/40	• Details or accessories
19/36	• • providing for remote drive by means of a flexible shaft; Transmission means therefor	21/42	• • for cutting hair of preselected or variable length (combs, stencils or guides specially adapted for hair trimming devices A45D 24/36)
19/38	• Details of, or accessories for, hair clippers, or dry shavers, e.g. housings, casings, grips, guards (cutters, cutting heads B26B 19/04, B26B 19/12, B26B 19/14; cleaning or disinfecting devices A45D 27/46; drying devices A45D 27/48; casings for electric apparatus in general H05K)	21/44	• • Means integral with, or attached to, the razor for storing shaving-cream, styptic, or the like
19/40	• • Lubricating	21/46	• • for illuminating the skin (B26B 19/46 takes precedence)
19/42	• • providing for straightening the hair to be cut, e.g. by means of bristles; providing for tensioning the skin, e.g. by means of rollers, ledges (skin-stretchers for shaving <u>per se</u> A45D 27/38)	21/48	• • Heating means
19/44	• • Suction means for collecting severed hairs or for the skin to be shaved	21/50	• • Means integral with, or attached to, the razor for stropping the blade
19/46	• • providing for illuminating the area to be shaved or clipped	21/52	• • Handles, e.g. tiltable, flexible
19/48	• • Accessory implements for carrying out a function other than cutting hair, e.g. attachable appliances for manicuring (massage means <u>per se</u> A61H 7/00-A61H 23/00)	21/54	• Razor-blades
<b>21/00</b>	<b>Razors of the open or knife type; Safety razors or other shaving implements of the planing type; Hair-trimming devices involving a razor-blade; Equipment therefor</b>	21/56	• • characterised by the shape [3]
21/02	• involving unchangeable blades	21/58	• • characterised by the material [3]
21/04	• • Razors of the knife type	21/60	• • • by the coating material [3]
		<b>23/00</b>	<b>Axes; Hatchets</b>
		<b>25/00</b>	<b>Hand cutting tools involving disc blades, e.g. motor-driven (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]</b>
		<b>27/00</b>	<b>Hand cutting tools not provided for in groups B26B 1/00-B26B 25/00, e.g. finger rings for cutting string, devices for cutting by means of wires</b>
		<b>29/00</b>	<b>Guards or sheaths for hand cutting tools; Arrangements for guiding hand cutting tools (guards for hair clippers or dry shavers B26B 19/38) [5]</b>
		29/02	• Guards or sheaths for knives

- 29/04 • Guards or sheaths for scissors, e.g. combined with manicuring appliances (manicuring implements per se A45D 29/00)

- 29/06 • Arrangements for guiding hand cutting tools (guiding equipment or arrangements for specific cutting tools, see the particular places, e.g. for hair trimming devices A45D 24/36, for saw blades B27B 11/02, B27B 13/10) [5]

**B26D CUTTING; DETAILS COMMON TO MACHINES FOR SEVERING, e.g. BY CUTTING, PERFORATING, PUNCHING, STAMPING-OUT** (soil-working A01B; for growing crops or plants A01D, A01G; for fodder or straw A01F; for bulk butter A01J; for dough A21C; slaughtering A22B; for tobacco, cigars or cigarettes A24; marking-out, perforating or making buttonholes A41H 25/00; manufacturing footwear A43D; brushmaking A46D; surgery A61B; disintegrating, mincing or shredding in general B02C; cutting wire, making pins or nails B21F, B21G; of the kind used for metal B23; cutting by abrasive fluid jets B24C 5/02; hand-held cutting tools B26B; perforating, cutting-out, stamping-out or punching, or severing by means other than cutting B26F; for wood B27; for stone B28D; working of plastics or substances in a plastic state B29; making boxes, cartons, envelopes or bags, of paper or similarly worked materials, e.g. metal foil, B31B; article or web delivery apparatus incorporating cutting or line-perforating devices B65H 35/00; for leather or upholstery B68, C14B; for glass C03B; making matches C06F; for peat C10F; for sugar C13B 45/00; for textile materials D06H; civil engineering, building, mining, see section E; devices for withdrawing samples by cutting G01N 1/04; for light guides G02B 6/25; cutting processed photographic material G03D 15/04) [2, 5]

### Note(s)

- This subclass covers :
  - cutting non-metallic sheet material or metal foil in general;
  - cutting other forms of non-metallic material not otherwise provided for;
  - features specific to machines for cutting, perforating, punching, cutting-out, stamping-out, or severing by means other than cutting, which relate to a requirement or problem of a nature which is not peculiar to a machine for these purposes, that is, details of or arrangements for operating or controlling such machines, although the realisation of such features may differ according to the kind of machine concerned. This subclass covers such features in general even if the feature, in any particular case, is to some extent peculiar to, or is claimed only for, a machine designed for perforating, punching, cutting-out, stamping-out, or for severing other than by cutting.
- If the details or arrangements have no essential features specific to cutting, perforating, punching, cutting-out, stamping-out or severing machines, the more general classes, e.g. F16, take precedence.

### Subclass index

CUTTING CHARACTERISED BY THE CUTTING MEMBER OR BY THE NATURE OF THE CUT PERFORMED..... 1/00, 3/00  
 ARRANGEMENTS FOR OPERATING AND CONTROLLING; DETAILS OF APPARATUS FOR SEVERING..... 5/00, 7/00  
 COMBINED APPARATUS..... 9/00, 11/00

<b>1/00</b>	<b>Cutting through work characterised by the nature or movement of the cutting member; Apparatus or machines therefor; Cutting members therefor [3]</b>	1/15	• • • • • with vertical cutting member [3]
		1/153	• • • • • with inclined cutting member [3]
1/01	• involving a cutting member which does not travel with the work [3]	1/157	• • • • • rotating about a movable axis (B26D 1/20-B26D 1/24 take precedence) [3]
1/02	• • having a stationary cutting member (B26D 1/547 takes precedence) [3]	1/16	• • • • • mounted on a movable arm or the like [3]
1/03	• • • with a plurality of cutting members [3]	1/18	• • • • • mounted on a movable carriage [3]
1/04	• • having a linearly-movable cutting member (B26D 1/46, B26D 1/547 take precedence) [3]	1/20	• • • • • coaxing with a fixed member [3]
1/06	• • • wherein the cutting member reciprocates (cup or like cutting members B26D 1/44) [3]	1/22	• • • • • coaxing with a movable member, e.g. a roller (B26D 1/24 takes precedence) [3]
1/08	• • • • • of the guillotine type [3]	1/24	• • • • • coaxing with another disc cutter [3]
1/09	• • • • • with a plurality of cutting members [3]	1/25	• • • • • with a non-circular cutting member [3]
1/10	• • • • • in, or substantially in, a direction parallel to the cutting edge [3]	1/26	• • • • • moving about an axis substantially perpendicular to the line of cut [3]
1/11	• • • • • with a plurality of cutting members [3]	1/28	• • • • • and rotating continuously in one direction during cutting [3]
1/12	• • having a cutting member moving about an axis (B26D 1/547 takes precedence; cup or like cutting members B26D 1/44) [3]	1/29	• • • • • with cutting member mounted in the plane of a rotating disc, e.g. for slicing beans [3]
1/14	• • • with a circular cutting member, e.g. disc cutter [3]	1/30	• • • • • with limited pivotal movement to effect cut [3]
1/143	• • • • • rotating about a stationary axis (B26D 1/20-B26D 1/24 take precedence) [3]	1/34	• • • • • moving about an axis parallel to the line of cut [3]
1/147	• • • • • with horizontal cutting member [3]		

- 1/36 • • • • and rotating continuously in one direction during cutting, e.g. mounted on a rotary cylinder (for flying cutting B26D 1/62) [3]
- 1/38 • • • • and coacting with a fixed blade or other fixed member [3]
- 1/40 • • • • and coacting with a rotary member [3]
- 1/42 • • • • and slidably mounted in a rotary member [3]
- 1/43 • • • • moving about another axis, e.g. mounted on the surface of a cone or curved body [3]
- 1/44 • • having a cup or like cutting member [3]
- 1/45 • • having a cutting member the movement of which is not covered by any preceding group [3]
- 1/46 • • having an endless band-knife or the like [3]
- 1/48 • • • with tensioning means [3]
- 1/50 • • • with a plurality of band-knives or the like [3]
- 1/52 • • • • having adjustable spacing between knives [3]
- 1/54 • • • Guides for band-knives or the like [3]
- 1/547 • • having a wire-like cutting member (endless wire B26D 1/46; severing using a heated wire B26F 3/12) [3]
- 1/553 • • • with a plurality of wire-like cutting members [3]
- 1/56 • involving a cutting member which travels with the work, i.e. flying cutter (flying shears for metal B23D 25/00; flying saws for metal B23D 45/18) [3]
- 1/58 • • and is mounted on a movable arm or the like [3]
- 1/60 • • and is mounted on a movable carriage [3]
- 1/62 • • and is rotating about an axis parallel to the line of cut, e.g. mounted on a rotary cylinder [3]

**3/00 Cutting work characterised by the nature of the cut made; Apparatus therefor [3]**

- 3/02 • Bevelling
- 3/06 • Grooving involving removal of material from the surface of the work
- 3/08 • Making a superficial cut in the surface of the work without removal of material, e.g. scoring, incising
- 3/10 • Making cuts of other than simple rectilinear form (cutting-out B26F)
- 3/11 • • to obtain pieces of spiral or helical form [3]
- 3/12 • Slitting marginal portions of the work, i.e. forming cuts, without removal of material, at an angle, e.g. a right angle, to the edge of the work
- 3/14 • Forming notches in marginal portion of work by cutting (by punching B26F 1/12)
- 3/16 • Cutting rods or tubes transversely
- 3/18 • to obtain cubes or the like (ice harvesting F25C 5/02) [3]
- 3/20 • • using reciprocating knives
- 3/22 • • using rotating knives
- 3/24 • to obtain segments other than slices, e.g. cutting pies
- 3/26 • • specially adapted for cutting fruit or vegetables, e.g. for onions
- 3/28 • Splitting layers from work; Mutually separating layers by cutting (B26D 3/30 take precedence; recovery of plastics or other constituents of waste material containing plastics B29B 17/00) [3]
- 3/30 • Halving devices, e.g. for halving buns [3]

**Note(s)**

In groups B26D 5/00 and B26D 7/00, the following term is used with the meaning indicated:

- "cutting" includes cutting-out, stamping-out, punching, perforating or severing by means other than cutting.

**5/00 Arrangements for operating and controlling machines or devices for cutting, cutting-out, stamping-out, punching, perforating, or severing by means other than cutting**

- 5/02 • Means for moving the cutting member into its operative position for cutting
- 5/04 • • by fluid pressure
- 5/06 • • by electrical means
- 5/08 • Means for actuating the cutting member to effect the cut
- 5/10 • • Hand or foot actuated means
- 5/12 • • Fluid-pressure means
- 5/14 • • Crank and pin means
- 5/16 • • Cam means
- 5/18 • • Toggle-link means (B26D 5/10-B26D 5/16 take precedence)
- 5/20 • with interrelated action between the cutting member and work feed
- 5/22 • • having the cutting member and work feed mechanically connected
- 5/24 • • • including a metering device
- 5/26 • • wherein control means on the work feed means renders the cutting member operative
- 5/28 • • • the control means being responsive to presence or absence of work
- 5/30 • • having the cutting member controlled by scanning a record carrier
- 5/32 • • • with the record carrier formed by the work itself
- 5/34 • • • scanning being effected by a photosensitive device
- 5/36 • • • scanning being effected by magnetic means
- 5/38 • with means operable by the moving work to initiate the cutting action
- 5/40 • • including a metering device
- 5/42 • with interrelated action between work feed and clamp (work clamping arrangements B26D 7/02)

**7/00 Details of apparatus for cutting, cutting-out, stamping-out, punching, perforating, or severing by means other than cutting (cutters B26D 1/00; arrangements for guiding hand cutting tools B26B 29/06; punching tools or dies, cutting-out knives or dies B26F) [5]**

- 7/01 • Means for holding or positioning work [3]
- 7/02 • • with clamping means [3]
- 7/04 • • • providing adjustable clamping pressure [3]
- 7/06 • Arrangements for feeding or delivering work of other than sheet, web, or filamentary form (feeding or discharging sheets, webs, or filaments B65H)
- 7/08 • Means for treating work or cutting member to facilitate cutting (tensioning band cutters B26D 1/48)
- 7/10 • • by heating (severing by heating B26F)
- 7/12 • • by sharpening the cutting member
- 7/14 • • by tensioning the work
- 7/18 • Means for removing cut-out material or waste
- 7/20 • Cutting beds
- 7/22 • Safety devices specially adapted for cutting machines (safety devices in general F16P)
- 7/24 • • arranged to disable the operating means for the cutting member
- 7/26 • Means for mounting or adjusting the cutting member; Means for adjusting the stroke of the cutting member

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|--|--|
| <p>7/27 • Means for performing other operations combined with cutting (B26D 9/00 takes precedence) [3]</p> <p>7/28 • • for counting the number of cuts or measuring cut lengths (B26D 5/24, B26D 5/40 take precedence) [3]</p> <p>7/30 • • for weighing cut product [3]</p> <p>7/32 • • for conveying or stacking cut product (means for removing cut-out material or waste B26D 7/18) [3]</p> | <p>7/34 • • for applying a coating, such as butter, to cut product [3]</p> <p><b>9/00 Cutting apparatus combined with punching or perforating apparatus or with dissimilar cutting apparatus</b></p> <p><b>11/00 Combinations of several similar cutting apparatus</b></p> |
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**B26F PERFORATING; PUNCHING; CUTTING-OUT; STAMPING-OUT; SEVERING BY MEANS OTHER THAN CUTTING** (marking-out, perforating or making buttonholes A41H 25/00; manufacturing footwear A43D; surgery A61B; punching metal B21D; drilling metal B23B; cutting of metal by applying heat locally, e.g. flame cutting, B23K; cutting by abrasive fluid jets B24C 5/02; details common to machines for severing B26D; drilling wood B27C; drilling stone B28D; working of plastics or substances in a plastic state B29; making boxes, cartons, envelopes or bags, of paper or similarly worked materials, e.g. metal foil, B31B; of glass C03B; of leather C14B; of textile materials D06H; for light guides G02B 6/25; of tickets G07B) [2, 5]

#### **Note(s)**

- This subclass covers:
  - perforating, punching, cutting-out, stamping-out;
  - severing, by means other than cutting, non-metallic sheet material or metal foil in general;
  - severing, by means other than cutting, other forms of non-metallic materials not otherwise provided for.
- Attention is drawn to Notes (1) and (2) following the title of subclass B26D.

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| <p><b>1/00 Perforating; Punching; Cutting-out; Stamping-out; Apparatus therefor</b> (perforating by laser beam B23K 26/00; subjecting the grinding tools or the abrading medium to vibration, e.g. grinding with ultrasonic frequency, B24B 1/04; perforating by sand-blasting B24C; punching cards or tapes for statistical and record purposes G06K 1/00)</p> <p>1/02 • Perforating by punching, e.g. with relatively-reciprocating punch and bed</p> <p>1/04 • • with selectively-operable punches</p> <p>1/06 • • with punching tools moving with the work</p> <p>1/08 • • • wherein the tools are carried by, and in operation move relative to, a rotative drum or similar support</p> <p>1/10 • • • Roller type punches</p> <p>1/12 • • to notch margins of work</p> <p>1/14 • • Punching tools; Punching dies</p> <p>1/16 • Perforating by tool or tools of the drill type</p> <p>1/18 • Perforating by slitting, i.e. forming cuts closed at their ends without removal of material</p> <p>1/20 • • with tools carried by a rotating drum or similar support (B26F 1/22 takes precedence)</p> <p>1/22 • • to form non-rectilinear cuts, e.g. for tabs</p> <p>1/24 • Perforating by needles or pins</p> <p>1/26 • Perforating by non-mechanical means, e.g. by fluid jet</p> | <p>1/28 • • by electrical discharges</p> <p>1/31 • • by radiation [3]</p> <p>1/32 • Hand-held perforating or punching apparatus, e.g. awls</p> <p>1/34 • • power actuated (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]</p> <p>1/36 • • Punching or perforating pliers</p> <p>1/38 • Cutting-out; Stamping-out</p> <p>1/40 • • using a press, e.g. of the ram type (presses in general B30B)</p> <p>1/42 • • • having a pressure roller</p> <p>1/44 • • Cutters therefor; Dies therefor</p> <p>1/46 • • • Loose press knives</p> <p><b>3/00 Severing by means other than cutting; Apparatus therefor</b> (severing by grinding B24B 27/06)</p> <p>3/02 • Tearing</p> <p>3/04 • Severing by squeezing (B26F 3/08 takes precedence)</p> <p>3/06 • Severing by using heat (severing by laser beam B23K 26/00)</p> <p>3/08 • • with heated members</p> <p>3/10 • • • with heated rollers or discs</p> <p>3/12 • • • with heated wires</p> <p>3/16 • • by radiation [3]</p> |
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## B27 WORKING OR PRESERVING WOOD OR SIMILAR MATERIAL; NAILING OR STAPLING MACHINES IN GENERAL

**B27B SAWS; COMPONENTS OR ACCESSORIES THEREFOR** (saws specially adapted for pruning or debranching A01G 3/08; sawing apparatus specially adapted for felling trees A01G 23/091; features not restricted to a particular type of wood saw B23D, e.g. attaching saw blades B23D 51/00; machine tool frames, beds, pillars or like members, in general B23Q 1/01) [5]

### Subclass index

#### SAWS CHARACTERISED BY THE ACTIVE ELEMENT

Reciprocating.....	3/00, 11/00, 19/00
Circular.....	5/00, 7/00, 9/00
Band or strap.....	13/00, 15/00
Chain.....	17/00
Other kinds.....	23/00
PORTABLE OR HAND SAWS.....	9/00, 21/00
ACTIVE ELEMENTS.....	23/00, 33/00
ACCESSORIES.....	25/00-31/00
SAWING TRUNKS OR LOGS, SAWS SPECIALLY ADAPTED THEREFOR.....	1/00, 3/00, 7/00, 15/00

- 1/00 Methods for subdividing trunks or logs essentially involving sawing** (features of machines used, see the relevant groups for the machines)
- 3/00 Gang saw mills; Other sawing machines with reciprocating saw blades, specially designed for length sawing of trunks**
- 3/02 • with vertically-reciprocating saw frame
  - 3/04 • • with multiple-blade saw frame
  - 3/06 • • with side blade saw frame
  - 3/08 • • • combined with a multiple-blade saw frame
  - 3/10 • • Saw frames or guides therefor
  - 3/12 • • Mechanisms for producing the reciprocating movement of the saw frame; Arrangements for damping vibration; Arrangements for counterbalancing (B27B 3/26 takes precedence)
  - 3/14 • • Arrangements for raising or lowering the feed rollers
  - 3/16 • • Driving mechanisms for the feed rollers
  - 3/18 • • Controlling equipment, e.g. for controlling the drive
  - 3/20 • • Equipment for guiding the sawn part of timber during machining, e.g. preventing faults due to torsional stress
  - 3/22 • with horizontally-reciprocating saw frame
  - 3/24 • • Arrangements for raising and lowering the saw frame
  - 3/26 • • Mechanisms for producing the reciprocating movement of the saw frame; Arrangements for damping vibrations; Arrangements for counterbalancing
  - 3/28 • Components
  - 3/30 • • Blade attachments, e.g. saw buckles; Stretching devices
  - 3/32 • • • the stretching devices being equipped with screw-threaded or wedging means
  - 3/34 • • • the stretching devices being actuated by fluid pressure
  - 3/36 • • Devices for adjusting the mutual distance of the saw blades
  - 3/38 • • • Spacing bars; Spacing plates
  - 3/40 • • Devices for adjusting the overhang of the saw

### Circular saws

- 5/00 Sawing machines working with circular saw blades** (for length sawing of trunks B27B 7/00); **Components or equipment therefor**
- 5/02 • characterised by a special purpose only
  - 5/04 • • for edge trimming
  - 5/06 • • for dividing plates in parts of determined size, e.g. panels
  - 5/065 • • • with feedable saw blades, e.g. arranged on a carriage [6]
  - 5/07 • • • the plate being positioned in a substantially vertical plane (B27B 5/075 takes precedence) [6]
  - 5/075 • • • characterised by having a plurality of saw blades, e.g. turning about perpendicular axes [6]
  - 5/08 • • for sawing with the saw blade abutting parallel against a surface of the workpiece
  - 5/10 • Wheeled circular saws; Circular saws designed to be attached to tractors or other vehicles and driven by same
  - 5/12 • Cylinder saws
  - 5/14 • Rim-driven circular saws
  - 5/16 • Saw benches (B27B 15/06 takes precedence)
  - 5/18 • • with feedable circular saw blade, e.g. arranged on a carriage
  - 5/20 • • the saw blade being adjustable according to depth or angle of cut; Radial saws, i.e. sawing machines with a pivoted radial arm for guiding the movable carriage
  - 5/22 • • with non-feedable circular saw blade
  - 5/24 • • • the saw blade being adjustable according to depth or angle of cut
  - 5/26 • • • the table being adjustable according to depth or angle of cut
  - 5/29 • Details; Component parts; Accessories [2]
  - 5/30 • • for mounting or securing saw blades or saw spindles
  - 5/32 • • • Devices for securing circular saw blades to the saw spindle

5/34	• • • Devices for securing a plurality of circular saw blades on a single saw spindle; Equipment for adjusting the mutual distance	15/08	• with a plurality of band saw blades
5/36	• • • Mounting for swivelling or tilting the circular saw blade		
5/38	• • Devices for braking the circular saw blade or the saw spindle; Devices for damping vibrations of the circular saw blade, e.g. silencing		
<b>7/00</b>	<b>Sawing machines working with circular saw blades, specially designed for length sawing of trunks</b>	<b>17/00</b>	<b>Chain saws; Equipment therefor</b>
7/02	• by making use of circular saws mounted substantially at right angles, e.g. vertically and horizontally	17/02	• Chain saws equipped with guide bar (B27B 17/06 takes precedence)
7/04	• by making use of a plurality of circular saws mounted on a single spindle; Arrangements for adjusting the mutual distances	17/04	• • Roller bearing guides
		17/06	• Chain saws mounted on a bow
		17/08	• Drives or gearings; Devices for swivelling or tilting the chain saw
		17/10	• • Transmission clutches specially designed for chain saws
		17/12	• Lubricating devices specially designed for chain saws
		17/14	• Arrangements for stretching the chain saw
<b>9/00</b>	<b>Portable power-driven circular saws for manual operation</b> (details or components, e.g. handles, casings, of portable power-driven tools not particularly related to the operation performed B25F 5/00) <b>[4]</b>	<b>19/00</b>	<b>Other reciprocating saws with power drive; Fret-saws</b> (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) <b>[4]</b>
9/02	• Arrangements for adjusting the cutting depth or the amount of tilting	19/02	• Saws with a power-driven blade chucked at both ends or at one end only, e.g. jig saws, scroll saws (B27B 19/10 takes precedence)
9/04	• Guiding equipment, e.g. for cutting panels	19/04	• • characterised by power drive, e.g. by electromagnetic drive
		19/06	• • Stationary machines
		19/09	• • portable <b>[2]</b>
<b>11/00</b>	<b>Cross-cut reciprocating saws with power drive; Appurtenances therefor</b>	19/10	• Fret-saws, i.e. with bilaterally-chucked saw blade in a manually-guided bow
11/02	• Arrangements for guiding the saw blade	19/12	• • with power drive
11/04	• • Supports able to be attached to the work	19/14	• • with hand drive
11/06	• Arrangements for chucking the saw blade, with or without releasable transmission mechanisms for uncoupling the drive	<b>21/00</b>	<b>Hand saws without power drive</b> (B27B 19/14 takes precedence); <b>Equipment for hand sawing, e.g. saw horses</b>
11/08	• Frames, pillars, or beds	21/02	• Buck or hack saws
11/10	• Devices for clamping the work or holding same in position	21/04	• Cross-cut saws; Pad saws
11/12	• Saw assemblies designed to be mounted on or driven by tractors	21/06	• Arrangements for stretching the saw blade
		21/08	• Arrangements of gauging or adjusting equipment on hand saws, e.g. for limiting the cutting depth
		<b>23/00</b>	<b>Other cutting of wood by non-rotary toothed tools; Tools therefor</b> (cutting with hot wire B27M 1/06)
<b>Band or strap sawing machines</b>		<b>Components or accessories for saws</b>	
<b>13/00</b>	<b>Band or strap sawing machines</b> (for length cutting of trunks B27B 15/00); <b>Components or equipment therefor</b>	<b>25/00</b>	<b>Feeding devices for timber in saw mills or sawing machines; Feeding devices for trees</b> (B27B 31/00 takes precedence) <b>[5]</b>
13/02	• Frames, Pillars	25/02	• with feed and pressure rollers
13/04	• Work-tables; Arrangements for tilting the band saw blade	25/04	• with feed chains or belts
13/06	• Saw pulleys; Bearings therefor	25/06	• Resilient feeding or pressing accessories, e.g. pads, springs
13/08	• Arrangements for stretching the band saw blade	25/08	• Feeding devices able to be attached to any sawing machine
13/10	• Guiding equipment for the band saw blade, e.g. guide rollers, back guides, side guides	25/10	• Manually-operated feeding or pressing accessories, e.g. pushers
13/12	• Lubricating devices specially designed for band saw blades		
13/14	• Braking devices specially designed for band sawing machines, e.g. acting after damage of the band saw blade	<b>27/00</b>	<b>Guide fences or stops for timber in saw mills or sawing machines; Measuring equipment thereon</b> (safety guards or devices specially designed for wood saws B27G 19/00; constructional features of measuring devices G01B)
13/16	• Accessories, e.g. for cooling the saw blade	27/02	• arranged laterally and parallel with respect to the plane of the saw blade
<b>15/00</b>	<b>Band or strap sawing machines specially designed for length cutting of trunks</b>	27/04	• arranged perpendicularly to the plane of the saw blade
15/02	• with horizontally-guided saw blade, i.e. horizontal log band saw		
15/04	• with vertically-guided saw blade		
15/06	• in combined arrangement with circular saws for performing simultaneously several sawing procedures		

## B27B

- 27/06 • arranged angularly with respect to the plane of the saw blade, e.g. for mitring
- 27/08 • arranged adjustably, not limited to only one of the groups B27B 27/02-B27B 27/06
- 27/10 • Devices for moving or adjusting the guide fences or stops
- 29/00 Gripping, clamping, or holding devices for the trunk or log in saw mills or sawing machines** (safety guards or devices specially designed for wood saws B27G 19/00; for other timber, see the relevant groups for the machines); **Travelling trunk or log carriages**
- 29/02 • Clamping angles; Gripping equipment thereon
- 29/04 • Trunk or log carriages with gripping means which do not pass the saw blade(s), especially for gang saws; Arrangement of gripping accessories thereon
- 29/06 • • Auxiliary trunk or log carriages for carrying initially the log to the feed rollers or for carrying the sawn part of the log
- 29/08 • Trunk or log carriages with gripping means designed to pass the saw blade(s), especially for band saws; Arrangement of gripping accessories thereon; Turning devices thereon
- 29/10 • • Assemblies for laterally adjusting or controlling the clamping or turning devices with respect to the thickness of the board to be sawn

## 31/00 Arrangements for conveying, loading, turning, adjusting, or discharging the log or timber, specially designed for saw mills or sawing machines

(B27B 29/00 takes precedence)

- 31/02 • Loading equipment for travelling carriages
- 31/04 • Turning equipment
- 31/06 • Adjusting equipment, e.g. using optical projection
- 31/08 • Discharging equipment

## 33/00 Sawing tools for saw mills, sawing machines, or sawing devices

- 33/02 • Structural design of saw blades or saw teeth
- 33/04 • • Gang saw blades
- 33/06 • • Band saw blades
- 33/08 • • Circular saw blades
- 33/10 • • Hand saw blades
- 33/12 • • Saw blades having inserted or exchangeably arranged bits or toothed segments
- 33/14 • Saw chains
- 33/16 • Saw wires; Twisted saw strips
- 33/18 • Saw cylinders having a toothed front rim
- 33/20 • Edge trimming saw blades or tools combined with means to disintegrate waste [2]

## B27C PLANING, DRILLING, MILLING, TURNING, OR UNIVERSAL MACHINES

(machine tools in general B23; working wood using abrasive, e.g. sanding, devices B24; tools for these purposes B27G)

### 1/00 Machines for producing flat surfaces, e.g. by rotary cutters; Equipment therefor

- 1/02 • Smoothing, i.e. working one side only
- 1/04 • Thicknessing machines
- 1/06 • Machines for smoothing and subsequent thicknessing
- 1/08 • Machines for working several sides of work simultaneously
- 1/10 • Hand planes equipped with power-driven cutter blocks (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]
- 1/12 • Arrangements for feeding work
- 1/14 • Other details or accessories

### 3/00 Drilling machines or drilling devices; Equipment therefor

(B23B takes precedence)

- 3/02 • Stationary drilling machines with a single working spindle
- 3/04 • Stationary drilling machines with a plurality of working-spindles
- 3/06 • Drilling machines or devices for making dowel holes
- 3/08 • Operator-supported drilling machines or devices

### 5/00 Machines designed for producing special profiles or shaped work, e.g. by rotary cutters; Equipment therefor

(turning B27C 7/00; features of copying devices B23Q 35/00; slotting, mortising, making tongues or grooves B27F)

- 5/02 • Machines with table
- 5/04 • • Guide fences for work
- 5/06 • • Arrangements for clamping or feed work
- 5/08 • Rounding machines
- 5/10 • Portable hand-operated wood-milling machines; Routers (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) [4]

### 7/00 Wood-turning machines; Equipment therefor

(B23B, B23G, B23Q take precedence; features of copying devices B23Q 35/00)

- 7/02 • Lathes for hand turning
- 7/04 • Devices for centring or chucking work
- 7/06 • Arrangements for guiding or supporting the tool, e.g. tool rests

### 9/00 Multi-purpose machines; Universal machines; Equipment therefor

- 9/02 • with a single working-spindle
- 9/04 • with a plurality of working-spindles

## B27D WORKING VENEER OR PLYWOOD

(applying liquids or other fluent materials to surfaces in general B05; grinding, sanding, or polishing of wood B24; applying adhesives or glue to surfaces of wood B27G 11/00; manufacture of veneer B27L 5/00)

### Note(s)

The layered products classified in this subclass are also classified in B32B.



- 1/00 Joining wood veneer with any material; Forming articles thereby** (manufacture by dry processes of articles made from particles or fibres consisting of wood or other lignocellulosic or like organic material B27N); **Preparatory processing of surfaces to be joined, e.g. scoring**
- 1/02 • Hot tables for warming veneers
- 1/04 • to produce plywood or articles made therefrom; Plywood sheets
- 1/06 • • Manufacture of central layers; Form of central layers
- 1/08 • • Manufacture of shaped articles; Presses specially designed therefor

- 1/10 • Butting blanks of veneer; Jointing same along edges; Preparatory processing of edges, e.g. cutting
- 3/00 Veneer presses; Press plates; Plywood presses** (presses in general B30B)
- 3/02 • with a plurality of press plates, i.e. multi-platen hot presses
- 3/04 • with endless arrangement of moving press plates, belts, or the like
- 5/00 Other working of veneer or plywood specially adapted to veneer or plywood** (working of strips in the same way as cane B27J)

**B27F DOVETAILED WORK; TENONS; SLOTTING MACHINES; NAILING OR STAPLING MACHINES** (hand-held nailing or stapling tools B25C; manufacture of cases, trunks or boxes from wood B27M 3/34; connections for building structures in general, e.g. dowels for use in building constructions E04B 1/38; jointing elements in general, e.g. dowels in general, F16B)

#### Note(s)

1. This subclass covers also the assembling of the elements to be jointed, e.g. using adhesives.
2. This subclass does not cover the application of adhesives or glue to surfaces of wood to be jointed, which is covered by group B27G 11/00.

- 1/00 Dovetailed work; Tenons; Making tongues or grooves** (slotting B27F 5/00); **Groove-and-tongue jointed work; Finger-joints** (machines or devices for working mitred joints B27G 5/00; cutting tools for cutting grooves or tenons B27G 13/14) [2]
- 1/02 • Making tongues or grooves, of indefinite length
- 1/04 • • along only one edge of a board
- 1/06 • • simultaneously along opposite edges of a board
- 1/08 • Making dovetails, tongues, or tenons, of definite limited length
- 1/10 • • Cutting fenons of round or rounded-off profile
- 1/12 • • Corner-locking machines, i.e. machines for cutting crenellated joints
- 1/14 • • • Arrangements of gauging means specially designed for corner-locking machines (measuring instruments G01)
- 1/16 • Making finger joints, i.e. joints having tapers in the opposite direction to those of dovetail joints (B27F 1/08 takes precedence) [2]
- 4/00 Machines for inserting dowels, with or without drilling equipment** (manufacture of wooden dowels B27M 3/28)
- 5/00 Slotted or mortised work** (hand mortising chisels B27G 17/08)
- 5/02 • Slotting or mortising machines
- 5/04 • • equipped with both chain cutters and chisel cutters
- 5/06 • • equipped with chain cutters
- 5/08 • • • Chain cutters
- 5/10 • • equipped with chisel cutters

- 5/12 • • for making holes designed for taking up fittings, e.g. in frames of doors, windows, furniture
- 7/00 Nailing or stapling** (surgical staplers A61B 17/068; hand-held nailing tools B25C 1/00; manually operated portable stapling tools, hand-held power-operated stapling tools B25C 5/00); **Nailed or stapled work**
- 7/02 • Nailing machines
- 7/04 • • Equipment for bending nails driven through
- 7/05 • • Driving means [3]
- 7/07 • • • operated by manual power [3]
- 7/09 • • • operated by fluid pressure [3]
- 7/11 • • • operated by electric power [3]
- 7/13 • • Nail feeding devices [3]
- 7/15 • Machines for driving in nail-plates [3]
- 7/17 • Stapling machines [3, 5]
- 7/19 • • with provision for bending the ends of the staples on to the work [3]
- 7/21 • • • with means for forming the staples in the machine [3]
- 7/23 • • • • with rotary drive [3]
- 7/26 • • without provision for bending the ends of the staples on to the work [3]
- 7/28 • • • with means for forming the staples in the machine [3]
- 7/30 • • Driving means [3]
- 7/32 • • • operated by manual power [3]
- 7/34 • • • operated by fluid pressure [3]
- 7/36 • • • operated by electric power [3]
- 7/38 • • Staple feeding devices [3]

**B27G ACCESSORY MACHINES OR APPARATUS; TOOLS** (sawing tools B27B 33/00; tools for slotting or mortising machines B27F 5/00; tools for the manufacture of wood shavings, chips, powder, or the like B27L 11/00); **SAFETY DEVICES, e.g. FOR SAWS** (clamping devices for mitre joints, presses for producing frames, press frames, or cages equipped with clamping devices B25B; woodworkers' benches B25H)

#### Subclass index

DEVICES OR MACHINES FOR REMOVING KNOTS OR OTHER UNUSABLE PARTS.....1/00, 3/00  
 DEVICES OR MACHINES FOR WORKING MITRE JOINTS OR FOR GLUING.....5/00, 11/00

## B27G

TOOLS.....	13/00, 15/00, 17/00
DEVICES FOR SAFETY OR PROPER OPERATION.....	19/00, 21/00, 23/00

### Accessory machines or apparatus

- 1/00**    **Machines or devices for removing knots or other irregularities or for filling-up holes**
- 3/00**    **Arrangements for removing bark-zones, chips, waste, or dust, specially designed for use in connection with wood-working machine or in wood-working plants**
- 5/00**    **Machines or devices for working mitre joints with even abutting ends** (with tenon or like connections B27F)
  - 5/02    • for sawing mitre joints; Mitre boxes (guide fences for timber in sawing machines B27B 27/00)
  - 5/04    • for planing, cutting, shearing, or milling mitre joints
- 11/00**   **Applying adhesives or glue to surfaces of wood to be joined** (applying liquids, e.g. liquid adhesives, to surfaces in general B05C, B05D; adhesive processes C09J 5/00; associated with particular wood-working, see the relevant subclasses) [2]
  - 11/02    • Glue vessels; Apparatus for warming or heating glue

### Tools [2]

- 13/00**   **Cutter blocks; Other rotary cutting tools** (B27G 15/00, B27G 17/00 take precedence)
- 13/02    • in the shape of long arbors, i.e. cylinder cutting blocks (B27G 13/12 takes precedence)
- 13/04    • • Securing the cutters by mechanical clamping means
- 13/06    • • Securing the cutters by fluid-pressure clamping means
- 13/08    • in the shape of disc-like members; Wood-milling cutters (B27G 13/12 takes precedence)

- 13/10    • • Securing the cutters, e.g. by clamping collars
- 13/12    • for profile cutting
- 13/14    • • for cutting grooves or tenons
- 13/16    • • for rounding rods, e.g. dowels

### **15/00**    **Boring or turning tools; Augers**

- 15/02    • Drills for undercutting holes

### **17/00**   **Manually-operated tools**

- 17/02    • Hand planes (equipped with power-driven cutter blocks B27C 1/10)
- 17/04    • Spokeshaves; Scrapers
- 17/06    • Rasps
- 17/08    • Mortise chisels

### Safety guards or devices

### **19/00**   **Safety guards or devices specially designed for wood saws** (in general F16P); **Auxiliary devices facilitating proper operation of wood saws**

- 19/02    • for circular saws
- 19/04    • • for manually-operated power-driven circular saws
- 19/06    • for band or strap saws
- 19/08    • Accessories for keeping open the saw kerf, e.g. riving knives, wedge plates
- 19/10    • Measures preventing splintering of sawn portions of wood

### **21/00**   **Safety guards or devices specially designed for other wood-working machines**

### **23/00**   **Gauging means specially designed for adjusting of tools or guides, e.g. adjusting cutting blades in cutter blocks** (for guides of sawing machines B27B 27/00)

## B27H    BENDING; COOPERAGE; WHEEL-MAKING

- 1/00**    **Bending wood, e.g. wood stock [2]**
- 3/00**    **Manufacture of constructional elements of tubs, coops or barrels** (assembly, e.g. coopering, B27H 5/00)
  - 3/02    • Manufacture of barrel staves
  - 3/04    • Manufacture of barrel heads or casings
- 5/00**    **Manufacture of tubs, coops or barrels** (from veneer strips or sheets B27D 1/00)
  - 5/02    • Building up with staves
- 5/04    • • Forming staves into the final shape and assembling same
- 5/08    • Finishing barrels, e.g. cutting grooves
- 5/10    • • Trussing or hooping barrels
- 5/12    • • Making bungs from wood; Drilling or reaming bung holes
- 7/00**    **Manufacture of wheels wholly or predominantly made from wood, e.g. cart wheels; Manufacture of wood-rimmed wheels, e.g. steering wheels [2]**

## B27J    MECHANICAL WORKING OF CANE, CORK, OR SIMILAR MATERIALS

### Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "working of cane" embraces the working of other materials, e.g. of strips of wood or plastics, in the same manner.

- 1/00 Mechanical working of cane or the like** (weaving D03D)
- 1/02 • Braiding, e.g. basket-making (braiding in general D04C)
- 3/00 Peeling osier rods** (debarking trees or logs B27L 1/00)

- 5/00 Mechanical working of cork** (manufacture by dry processes of articles made from particles or fibres of cork B27N)
- 7/00 Mechanical working of tree or plant materials not otherwise provided for**

**B27K PROCESSES, APPARATUS OR SELECTION OF SUBSTANCES FOR IMPREGNATING, STAINING, DYEING OR BLEACHING OF WOOD, OR FOR TREATING OF WOOD WITH PERMEANT LIQUIDS, NOT OTHERWISE PROVIDED FOR** (applying liquids or other fluent materials to surfaces in general B05; coating wood or similar material B44D); **CHEMICAL OR PHYSICAL TREATMENT OF CORK, CANE, REED, STRAW OR SIMILAR MATERIALS [2]**

- 1/00 Damping wood**
- 1/02 • Apparatus
- 3/00 Impregnating wood** (dyeing, staining B27K 5/00)
- 3/02 • Processes; Apparatus
- 3/04 • • Impregnating in open tanks
- 3/06 • • Sap stream methods
- 3/08 • • Impregnating by pressure
- 3/10 • • • Apparatus
- 3/12 • • Impregnating by coating the surface of the wood with an impregnating paste
- 3/14 • • Bandage methods
- 3/15 • • Impregnating involving polymerisation [2]

**Note(s)**

In groups B27K 3/16-B27K 3/34, in the absence of an indication to the contrary, impregnating agents are classified in the last appropriate place.

- 3/16 • Inorganic impregnating agents
- 3/18 • • Compounds of alkaline earth metals
- 3/20 • • Compounds of alkali metals or ammonium
- 3/22 • • Compounds of zinc or copper
- 3/24 • • Compounds of mercury
- 3/26 • • Compounds of iron, aluminium, or chromium
- 3/28 • • Compounds of arsenic or antimony
- 3/30 • • Compounds of fluorine

- 3/32 • • Mixtures of different inorganic impregnating agents
- 3/34 • Organic impregnating agents
- 3/36 • • Aliphatic compounds
- 3/38 • • Aromatic compounds
- 3/40 • • • halogenated
- 3/42 • • • nitrated, or nitrated and halogenated
- 3/44 • • Tar; Mineral oil
- 3/46 • • • Coal tar
- 3/48 • • • Mineral oil
- 3/50 • • Mixtures of different organic impregnating agents
- 3/52 • Impregnating agents containing mixtures of inorganic and organic compounds

**5/00 Treating of wood not provided for in groups B27K 1/00, B27K 3/00**

- 5/02 • Staining or dyeing wood; Bleaching wood (bleaching wood pulp D21C 9/10)
- 5/04 • Combined bleaching or impregnating and drying of wood
- 5/06 • Softening or hardening wood

**7/00 Chemical or physical treatment of cork** (mechanical working of cork B27J 5/00)

**9/00 Chemical or physical treatment of reed, straw, or similar material** (mechanical working of cane or the like B27J 1/00)

**B27L REMOVING BARK OR VESTIGES OF BRANCHES** (forestry A01G); **SPLITTING WOOD; MANUFACTURE OF VENEER, WOODEN STICKS, WOOD SHAVINGS, WOOD FIBRES OR WOOD POWDER**

- 1/00 Debarking or removing vestiges of branches from trees or logs** (debarking by chemical treatment B27L 3/00); **Machines therefor [2]**

**Note(s)**

Tree-feeding devices are covered by group B27B 25/00.

- 1/02 • by rubbing the trunks against each other (B27L 1/04 takes precedence); Equipment for wet practice [5]
- 1/04 • by rubbing the trunks in rotating drums [5]
- 1/05 • • Drums therefor [5]
- 1/06 • Manually-operated or portable devices for debarking or for removing vestiges of branches
- 1/08 • using rotating rings [5]
- 1/10 • using rotatable tools (B27L 1/04, B27L 1/08, B27L 1/12 take precedence) [5]
- 1/12 • using pliable tools [5]
- 1/14 • using jets of fluid [5]

**3/00 Debarking by chemical treatment**

- 5/00 Manufacture of veneer** (working veneer or plywood B27D)
- 5/02 • Cutting strips from a rotating trunk or piece; Veneer lathes
- 5/04 • • the trunk being rotated about an axis lying outside it
- 5/06 • Cutting strips from a stationarily-held trunk or piece by a rocking knife carrier, or from rocking trunk or piece by a stationarily-held knife carrier; Veneer-cutting machines
- 5/08 • Severing sheets or segments from veneer strips; Shearing devices therefor; Making veneer blanks, e.g. trimming to size
- 7/00 Arrangements for splitting wood [6]**
- 7/02 • using rotating members [6]
- 7/04 • • Conical screws [6]
- 7/06 • using wedges, knives or spreaders (B27L 7/02 takes precedence) [6]
- 7/08 • using chopping blocks [6]

**B27L**

**9/00 Manufacture of wooden sticks, e.g. toothpicks** (of walking sticks, of sticks for umbrellas B27M 3/38; combined with other operations in the manufacture of matches C06F)

**11/00 Manufacture of wood shavings, chips, powder, or the like** (disintegrating in general B02C; edge trimming sawing blades or sawing tools combined with means to disintegrate waste B27B 33/20; obtaining fibres for spinning D01B 1/00; wet methods D21B 1/12); **Tools therefor [2]**

- 11/02 • of wood shavings or the like
- 11/04 • • of wood wool
- 11/06 • of wood powder or sawdust (grinding-stones B24D)
- 11/08 • of wood fibres, e.g. produced by tearing

**B27M WORKING OF WOOD NOT PROVIDED FOR IN SUBCLASSES B27B-B27L; MANUFACTURE OF SPECIFIC WOODEN ARTICLES**

**1/00 Working of wood not provided for in subclasses B27B-B27L, e.g. by stretching [2]**

- 1/02 • by compressing
- 1/04 • by punching out
- 1/06 • by burning or charring, e.g. cutting with hot wire (as surface treatment B44B)
- 1/08 • by multi-step processes [2]

**3/00 Manufacture or reconditioning of specific semi-finished or finished articles** (features of copying devices B23Q; manufacture of plywood or veneer, shaping plywood or veneer into articles B27D; of central layers for plywood B27D 1/06; nailing or stapling machines in general B27F 7/00; of elements for cooperage or wheel-making B27H)

- 3/02 • of roofing elements, e.g. shingles
- 3/04 • of flooring elements, e.g. parqueting blocks (assembling wooden elements on backings of other substances B32B, e.g. B32B 37/00)
- 3/06 • • of composite floor plates by assembling or jointing the parqueting blocks
- 3/08 • of specially-shaped wood laths or strips
- 3/10 • of airscrew blades

- 3/12 • of railings, stairs, stair stringers, ladders, or parts thereof
- 3/14 • of railroad sleepers
- 3/16 • of tool handles or tools, e.g. mallets
- 3/18 • of furniture
- 3/20 • of lasts; of shoes, e.g. sabots; of parts of shoes, e.g. heels
- 3/22 • of sport articles, e.g. bowling pins, frames of tennis rackets, skis, paddles
- 3/24 • of household utensils, e.g. spoons, clothes hangers, clothes pegs
- 3/26 • of smokers utensils, e.g. pipes
- 3/28 • of dowels or bolts
- 3/30 • of bobbins
- 3/32 • of tapered poles, e.g. mine props
- 3/34 • of cases, trunks, or boxes, of wood or equivalent material which cannot satisfactorily be bent without softening (nailing or stapling in general B25C, B27F; of cardboard, paper, or similarly workable material B31B)
- 3/36 • • Machines or devices for attaching blanks together, e.g. for making wire-bound boxes
- 3/38 • of walking sticks or of sticks for umbrellas

**B27N MANUFACTURE BY DRY PROCESSES OF ARTICLES, WITH OR WITHOUT ORGANIC BINDING AGENTS, MADE FROM PARTICLES OR FIBRES CONSISTING OF WOOD OR OTHER LIGNOCELLULOSIC OR LIKE ORGANIC MATERIAL** (containing cementitious material B28B; shaping of substances in a plastic state B29C; fibreboards made from fibrous suspensions D21J; drying F26B 17/00) [4]

**Note(s)**

This subclass does not cover treatment of compositions which are in a plastic state, or worked by the same type of process or apparatus as plastics, which is covered by subclass B29B or B29C.

**1/00 Pretreatment of moulding material [4]**

- 1/02 • Mixing the material with binding agent (mixing in general B01F) [4]

**3/00 Manufacture of substantially flat articles, e.g. boards, from particles or fibres [4]**

- 3/02 • from particles [4]
- 3/04 • from fibres [4]
- 3/06 • Making particle boards or fibreboards, with preformed covering layers, the particles or fibres being compressed with the layers to a board in one single pressing operation [4]
- 3/08 • Moulding or pressing (presses in general B30B) [4]
- 3/10 • • Moulding of mats [4]
- 3/12 • • • from fibres [4]

- 3/14 • • • Distributing or orienting the particles or fibres [4]
- 3/16 • • Transporting the material from mat moulding stations to presses (B27N 3/22 takes precedence); Apparatus specially adapted for transporting the material or component parts therefor, e.g. cauls (transport devices in general B65G) [4]
- 3/18 • • Auxiliary operations, e.g. preheating, humidifying, cutting-off [4]
- 3/20 • • characterised by using platen-presses [4]
- 3/22 • • • Charging or discharging [4]
- 3/24 • • characterised by using continuously acting presses having endless belts or chains moved within the compression zone [4]

- 3/26 • • characterised by using continuously acting presses having a heated press drum and an endless belt to compress the material between belt and drum [4]
- 3/28 • • characterised by using extrusion presses [4]
- 5/00 **Manufacture of non-flat articles [4]**
- 5/02 • Hollow articles [4]

7/00 **After-treatment, e.g. reducing swelling or shrinkage, surfacing; Protecting the edges of boards against access of humidity [4]**

9/00 **Arrangements for fireproofing** (fireproofing materials C09K 21/00) [4]

## B28 WORKING CEMENT, CLAY, OR STONE

**B28B SHAPING CLAY OR OTHER CERAMIC COMPOSITIONS, SLAG OR MIXTURES CONTAINING CEMENTITIOUS MATERIAL, e.g. PLASTER** (foundry moulding B22C; working stone or stone-like material B28D; shaping of substances in a plastic state, in general B29C; making layered products not composed wholly of these substances B32B; shaping *in situ*, see the relevant classes of section E)

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "the material" means:
  - a. clay or other ceramic compositions;
  - b. slag;
  - c. mixtures with water-setting properties given by clay, cementitious material, or slag.

### Subclass index

#### PRODUCING ARTICLES

Shaping articles characterised by method of production, machines therefor.....1/00, 3/00, 5/00

Coating of surfaces.....19/00

APPARATUS OR PROCESSES FOR TREATING OR WORKING ARTICLES.....11/00

MOULDS; AUXILIARY EQUIPMENT.....7/00, 13/00, 17/00

GENERAL LAYOUT OF PLANT.....15/00

PRODUCTION OF TUBULAR OR REINFORCED ARTICLES.....21/00, 23/00

**1/00 Producing shaped articles from the material** (using presses B28B 3/00; shaping on moving conveyers B28B 5/00; producing tubular articles B28B 21/00)

1/02 • by turning or jiggering

1/04 • by tamping or ramming (followed by pressing B28B 3/02)

1/08 • by vibrating or jolting

1/087 • • by means acting on the mould [6]

1/093 • • by means directly acting on the material, e.g. by cores wholly or partly immersed in the material (internal vibrators for compacting concrete *in situ* E04G 21/08) [6]

1/10 • • and applying pressure otherwise than by the use of presses

1/14 • by simple casting, the material being neither forcibly fed nor positively compacted (for molten material B28B 1/54)

1/16 • • for producing layered articles (coating B28B 11/04)

1/20 • by centrifugal or rotational casting (slip-casting involving rotation of the mould B28B 1/28; for molten material B28B 1/54)

1/24 • by injection moulding

1/26 • by slip-casting, i.e. by casting a suspension or dispersion of the material in a liquid-absorbent or porous mould, the liquid being allowed to soak into or pass through the walls of the mould; Moulds therefor (B28B 1/52 takes precedence)

1/28 • • involving rotation of the mould

1/29 • by profiling or strickling the material in open moulds or on moulding surfaces

1/30 • by applying the material on to a core, or other moulding surface to form a layer thereon (to form a permanent layer B28B 19/00)

1/32 • • by projecting, e.g. spraying (spraying in general B05B, B05D)

1/34 • • • by centrifugal force

1/38 • • by dipping (in general B05C, B05D)

1/40 • • by wrapping, e.g. winding

1/42 • • • using mixtures containing fibres, e.g. for making sheets by slitting the wound layer

1/44 • by forcing cores into filled moulds for forming hollow articles

1/48 • by removing material from solid section preforms for forming hollow articles, e.g. by punching or boring

1/50 • specially adapted for producing articles of expanded material, e.g. cellular concrete (chemical aspects C04B)

1/52 • specially adapted for producing articles from mixtures containing fibres (by wrapping on to mandrels B28B 1/42)

1/54 • specially adapted for producing articles from molten material, e.g. slag (chemical aspects C04B)

**3/00 Producing shaped articles from the material by using presses** (shaping on moving conveyers B28B 5/00); **Presses specially adapted therefor** (presses in general B30B)

- 3/02 • wherein a ram exerts pressure on the material in a moulding space; Ram heads of special form
- 3/04 • • with one ram per mould (B28B 3/10 takes precedence)
- 3/06 • • • with two or more ram and mould sets
- 3/08 • • with two or more rams per mould
- 3/10 • • each charge of material being compressed against previously formed body
- 3/12 • wherein one or more rollers exert pressure on the material
- 3/14 • • with co-operating pocketed rollers
- 3/16 • • with co-operating profiled rollers
- 3/18 • • Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring
- 3/20 • wherein the material is extruded
- 3/22 • • by screw or worm
- 3/24 • • by reciprocating plunger
- 3/26 • • Extrusion dies
- 5/00 Producing shaped articles from the material in moulds or on moulding surfaces, carried or formed by, in, or on conveyers irrespective of the manner of shaping** (shaping aspects, see the relevant groups)
- 5/02 • on conveyers of the endless-belt or chain type (in combination with pressing rollers B28B 3/12)
- 5/04 • in moulds moved in succession past one or more shaping stations (on turntables B28B 5/06)
- 5/06 • in moulds on a turntable
- 5/08 • • intermittently rotated
- 5/10 • in moulds carried on the circumference of a rotating drum
- 5/12 • • intermittently rotated
- 7/00 Moulds; Cores; Mandrels** (specially adapted for the production of tubular articles B28B 21/00)
- 7/02 • Moulds with adjustable parts
- 7/04 • • one or more of the parts being pivotally mounted
- 7/06 • Moulds with flexible parts
- 7/08 • Moulds provided with means for tilting or inverting
- 7/10 • Moulds with means incorporated therein, or carried thereby, for ejecting the moulded article (devices, not forming part of the mould, for ejecting the moulded article B28B 13/06)
- 7/12 • • by fluid pressure
- 7/14 • Moulds with means incorporated therein, or carried thereby, for cutting the moulded article into parts (cutting means independent of the mould B28B 11/14)
- 7/16 • Moulds for making shaped articles with cavities or holes open to the surface
- 7/18 • • the holes passing completely through the article
- 7/20 • Moulds for making shaped articles with undercut recesses, e.g. dovetails
- 7/22 • Moulds for making units for prefabricated buildings; Moulds for making prefabricated stair units
- 7/24 • Unitary mould structures with a plurality of moulding spaces
- 7/26 • Assemblies of separate moulds
- 7/28 • Cores; Mandrels
- 7/30 • • adjustable, collapsible, or expanding
- 7/32 • • • inflatable (connection of valves to inflatable elastic bodies B60C 29/00)
- 7/34 • Moulds, cores, or mandrels of special material, e.g. destructible materials (for slip-casting B28B 1/26)
- 7/36 • Linings or coatings (lubricating surfaces of moulds, cores, or mandrels B28B 7/38)
- 7/38 • Treating surfaces of moulds, cores, or mandrels to prevent sticking
- 7/40 • characterised by means for modifying the properties of the moulding material [5]
- 7/42 • • for heating or cooling, e.g. steam jackets [5]
- 7/44 • • for treating with gases or degassing, e.g. for de-aerating [5]
- 7/46 • • for humidifying or dehumidifying [5]
- 11/00 Apparatus or processes for treating or working the shaped articles** (specially adapted for tubular articles B28B 21/92; decoration or surface treatment in general B05, B44; compacting concrete *in situ* in connection with building E04G 21/06; drying F26)
- 11/02 • for attaching appendages, e.g. handles, spouts
- 11/04 • for coating (glazing, engobing C04B)
- 11/06 • • with powdered or granular material
- 11/08 • for reshaping the surface, e.g. smoothing, roughening, corrugating, making screw-threads
- 11/10 • • by using presses
- 11/12 • for removing parts of the articles by cutting
- 11/14 • for dividing shaped articles by cutting
- 11/16 • • for extrusion
- 11/18 • for removing burr
- 11/22 • for cleaning
- 11/24 • for curing, setting or hardening (processes for influencing or modifying the setting or hardening ability of mortars, concrete or artificial stone compositions, in general C04B 40/00) [6]
- 13/00 Feeding the unshaped material to moulds or apparatus for producing shaped articles; Discharging shaped articles from such moulds or apparatus** (feeding or discharging devices incorporated in, or operatively associated with, a particular type of shaping apparatus, or specially designed to supply materials to a particular type of shaping apparatus, see the relevant groups for the apparatus)
- 13/02 • Feeding the unshaped material to moulds or apparatus for producing shaped articles
- 13/04 • Discharging the shaped articles (conveying systems for ceramic mouldings B65G 49/08)
- 13/06 • • Removing the shaped articles from moulds (by means incorporated in, or carried by, the moulds B28B 7/10)
- 15/00 General arrangement or layout of plant**
- 17/00 Details of, or accessories for, apparatus for shaping the material; Auxiliary measures taken in connection with such shaping** (moulds B28B 7/00; after-treatment B28B 11/00; feeding or discharging B28B 13/00; arrangements for embedding elements in the material B28B 23/00; details, accessories, or auxiliary measures special to any one type of shaping, machine or method of shaping, see the relevant groups for such machines or methods)
- 17/02 • Conditioning the material prior to shaping
- 17/04 • Exhausting or laying dust
- 19/00 Machines or methods for applying the material to surfaces to form a permanent layer thereon** (making shaped articles on mandrels B28B 1/30; applying liquids or other fluent materials to surfaces in general B05C; glazing or engobing C04B; applying the material to walls or other fixed structures, see the relevant classes of section E)

**Methods, apparatus, or machines, specially adapted for the production of tubular or reinforced articles**

**21/00 Methods or machines specially adapted for the production of tubular articles**

- 21/02 • by casting into moulds
- 21/04 • • by simple casting, the material being neither positively compacted nor forcibly fed
- 21/06 • • into moulds having sliding parts (B28B 21/26 takes precedence; forms, shutterings, or falsework for making rooms as a whole, whole stories, or whole buildings in situ E04G 11/02)
- 21/08 • • by slip-casting; Moulds therefor
- 21/10 • • using compacting means
- 21/12 • • • tamping or ramming the material or the mould elements
- 21/14 • • • vibrating, e.g. the surface of the material
- 21/16 • • • • one or more mould elements
- 21/18 • • • using expansible or retractable mould or core elements
- 21/20 • • • • using inflatable cores, e.g. having a frame inside the inflatable part of the core (connection of valves to inflatable elastic bodies B60C 29/00) [2]
- 21/22 • • • using rotatable mould or core parts
- 21/24 • • • • using compacting heads, rollers, or the like
- 21/26 • • • • • with a packer head serving as a sliding mould or provided with guiding means for feeding the material
- 21/28 • • • • • combined with vibration means
- 21/30 • • • • Centrifugal moulding
- 21/32 • • • • Feeding the material into the moulds
- 21/34 • • • • • combined with vibrating or other additional compacting means
- 21/36 • • • applying fluid pressure or vacuum to the material (combined with slip-casting B28B 21/08)
- 21/38 • • • • introducing the material wholly or partly under pressure
- 21/40 • • • • by evacuating one or more of the mould parts
- 21/42 • by shaping on or against mandrels or like moulding surfaces
- 21/44 • • by projecting, e.g. spraying
- 21/46 • • by dipping
- 21/48 • • by wrapping, e.g. winding
- 21/50 • • Details of compression or compacting means
- 21/52 • by extruding
- 21/54 • • Mouthpieces for shaping sockets, bends, or like peculiarly-shaped tubular articles

- 21/56 • incorporating reinforcements
- 21/58 • • Steel tubes
- 21/60 • • prestressed reinforcements
- 21/62 • • • circumferential
- 21/64 • • • • Winding arrangements
- 21/66 • • • Reinforcing mats
- 21/68 • • and applying centrifugal forces
- 21/70 • by building-up from preformed elements
- 21/72 • • Producing multilayer tubes
- 21/74 • • Producing pipe bends, sockets, sleeves; Moulds therefor (combined with extrusion presses B28B 21/54)
- 21/76 • Moulds
- 21/78 • • with heating or cooling means, e.g. steam jackets
- 21/80 • • adapted to centrifugal or rotational moulding
- 21/82 • • built-up from several parts; Multiple moulds; Moulds with adjustable parts
- 21/84 • • • Moulds with one or more pivotable parts
- 21/86 • Cores (in general B28B 7/00)
- 21/88 • • adjustable, collapsible or expansible (using inflatable cores B28B 21/20)
- 21/90 • Methods or apparatus for discharging after shaping
- 21/92 • Methods or apparatus for treating or reshaping
- 21/94 • • for impregnating or coating by applying liquids or semi-liquids
- 21/96 • • for smoothing, roughening, corrugating or for removing burr
- 21/98 • • for reshaping, e.g. by means of reshape moulds

**23/00 Arrangements specially adapted for the production of shaped articles with elements wholly or partly embedded in the moulding material** (B28B 21/00 takes precedence; in units for prefabricated buildings B28B 7/22)

- 23/02 • wherein the elements are reinforcing members
- 23/04 • • the elements being stressed
- 23/06 • • • for the production of elongated articles
- 23/08 • • • • the articles being of tubular form
- 23/10 • • • the shaping being effected by centrifugal or rotational moulding [2]
- 23/12 • • • to form prestressed circumferential reinforcements [2]
- 23/14 • • • • by wrapping, e.g. winding apparatus [2]
- 23/16 • • • • Prestressed reinforcing nets [2]
- 23/18 • • for the production of elongated articles (B28B 23/06 takes precedence) [2]
- 23/20 • • the shaping being effected by centrifugal or rotational moulding (B28B 23/10 takes precedence) [2]
- 23/22 • • assembled from preformed parts [2]

**B28C PREPARING CLAY; PRODUCING MIXTURES CONTAINING CLAY OR CEMENTITIOUS MATERIAL, e.g. PLASTER** (preparing material for foundry moulds B22C 5/00)

**Note(s)**

In this subclass, the following terms or expressions are used with the meanings indicated:

- "cement" or "mixtures of cement with other substances" includes plaster;
- "clay" includes like ceramic compositions.

**1/00 Apparatus or methods for obtaining or processing clay** (filtration in general B01D; separation of solids from solids B03, B07; chemical part C04B; by mining or quarrying E21C 41/16, E21C 41/26, E21C 47/10)

- 1/02 • for producing or processing clay suspensions (producing or processing suspensions in general B01)
- 1/04 • • Producing suspensions, e.g. by blunging
- 1/06 • • Processing suspensions

## B28C

- 1/08 • • • Separating suspensions, e.g. for obtaining clay, for removing stones (filtration in general B01D; separation of solids from solids B03, B07)
- 1/10 • for processing clay-containing substances in non-fluid condition (clay slurries B28C 1/02)
- 1/12 • • Storing and conditioning in storage; Specially adapted storage spaces or devices for their filling or emptying (feeding clay to shaping apparatus B28B 13/00)
- 1/14 • • specially adapted for homogenising, comminuting or conditioning clay in non-fluid condition or for separating undesired admixtures therefrom (processes involving conversion to a slurry B28C 1/02; conditioning in storage B28C 1/12; comminuting in general B02C; chemical features in eliminating iron or lime C04B)
- 1/16 • • • for homogenising, e.g. by mixing, kneading
- 1/18 • • • for comminuting
- 1/20 • • • for separating undesired admixed bodies
- 1/22 • • • combined with means for conditioning by heating, humidifying, or vacuum treatment

### Mixing clay or cement with other material

#### Note(s)

In groups B28C 3/00-B28C 7/00, the following term is used with the meaning indicated:

- "mixing" includes preliminary mixing, e.g. of some of the ingredients, final mixing, and agitating the mixture to prevent segregation thereof.

- 3/00 **Apparatus or methods for mixing clay with other substances** (producing clay suspensions B28C 1/02; general arrangement or layout of plant B28C 9/00)
- 5/00 **Apparatus or methods for producing mixtures of cement with other substances, e.g. slurries, mortars, porous or fibrous compositions** (controlling the mixing apparatus and supplying the ingredients B28C 7/00; general arrangement or layout of plant B28C 9/00)
- 5/02 • without using driven mechanical means effecting the mixing (B28C 5/48 takes precedence) [5]
- 5/04 • • Gravitational mixing; Mixing by intermingling streams of ingredients (ingredients projected by fluid pressure B28C 5/06)
- 5/06 • • the mixing being effected by the action of a fluid (in combination with driven mechanical means B28C 5/38)
- 5/08 • using driven mechanical means affecting the mixing (B28C 5/40, B28C 5/42, B28C 5/48 take precedence; in combination with the action of a fluid B28C 5/38) [5]
- 5/10 • • Mixing in containers not actuated to effect the mixing
- 5/12 • • • with stirrers sweeping through the materials

- 5/14 • • • • the stirrers having motion about a horizontal or substantially horizontal axis
- 5/16 • • • • the stirrers having motion about a vertical or steeply inclined axis
- 5/18 • • Mixing in containers to which motion is imparted to effect the mixing
- 5/20 • • • rotating about a horizontal or substantially horizontal axis during mixing, e.g. without independent stirrers
- 5/22 • • • • with stirrers held stationary
- 5/24 • • • • with driven stirrers
- 5/26 • • • rotating about a vertical or steeply inclined axis during the mixing
- 5/28 • • • • without independent stirrers
- 5/30 • • • • with stirrers held stationary
- 5/32 • • • • with driven stirrers
- 5/34 • • Mixing on or by conveyers
- 5/36 • • • Endless-belt mixers
- 5/38 • wherein the mixing is effected both by the action of a fluid and by directly-acting driven mechanical means, e.g. stirring means
- 5/40 • Mixing specially adapted for preparing mixtures containing fibres
- 5/42 • Apparatus specially adapted for being mounted on vehicles with provision for mixing during transport (vehicle aspect B60P 3/16)
- 5/44 • Apparatus specially adapted for drive by muscle power
- 5/46 • Arrangements for applying super- or sub-atmospheric pressure during mixing; Arrangements for cooling or heating during mixing
- 5/48 • wherein the mixing is effected by vibrations (mixers with vibrating mechanisms in general B01F 11/00) [5]
- 7/00 **Controlling the operation of apparatus for producing mixtures of clay or cement with other substances; Supplying or proportioning the ingredients for mixing clay or cement with other substances; Discharging the mixture**
- 7/02 • Controlling the operation of the mixing
- 7/04 • Supplying or proportioning the ingredients
- 7/06 • • Supplying the solid ingredients, e.g. by means of endless conveyers or jiggling conveyers
- 7/08 • • • by means of scrapers or skips
- 7/10 • • • by means of rotary members
- 7/12 • • Supplying or proportioning liquid ingredients
- 7/14 • Supply means incorporated in or mounted on mixers
- 7/16 • Discharge means

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#### **9/00 General arrangement or layout of plant [2]**

- 9/02 • for producing mixtures of clay or cement with other materials [2]
- 9/04 • the plant being mobile (B28C 5/42 takes precedence) [2]

## **B28D WORKING STONE OR STONE-LIKE MATERIALS** (machinery for, or methods of, mining or quarrying E21C)

- 1/00 **Working stone or stone-like materials, e.g. brick, concrete, not provided for elsewhere; Machines, devices, tools therefor** (fine working of gems, jewels, crystals B28D 5/00; working by grinding or polishing

B24; devices or means for dressing or conditioning abrasive surfaces B24B 53/00)

- 1/02 • by sawing
- 1/04 • • with circular saw blades or saw discs (B28D 1/10 takes precedence)



- 1/06 • • with reciprocating saw blades (B28D 1/10 takes precedence)
- 1/08 • • with saw blades of endless cutter-type, e.g. chain saws, strap saws (B28D 1/10 takes precedence)
- 1/10 • • with provision for measuring
- 1/12 • • Saw blades specially adapted for working stone
- 1/14 • by boring or drilling (rotary drilling machines B23B; percussive tools B25D; earth or rock drilling E21B) [1, 7]
- 1/16 • by turning
- 1/18 • by milling, e.g. channelling by means of milling tools
- 1/20 • by planing, e.g. channeling by means of planing tools
- 1/22 • by cutting, e.g. incising
- 1/24 • • with cutting discs
- 1/26 • by impact tools, e.g. by chisels or other tools having a cutting edge (portable percussive machines B25D)
- 1/28 • • without cutting edge
- 1/30 • to form contours, i.e. curved surfaces, irrespective of the method of working used (for artistic purposes B44B)
- 1/32 • Methods or apparatus specially adapted for working materials which can easily be split, e.g. mica, slate, schist
- 3/00 **Dressing mill discs or rollers** (dressing the tools of sawing machines or sawing devices B23D 63/00; treating the cutting members of cutting machines to facilitate cutting B26D 7/08)
- 3/02 • Machines
- 3/04 • • for grooving rollers
- 5/00 **Fine working of gems, jewels, crystals, e.g. of semiconductor material; Apparatus therefor** (working by grinding or polishing B24; for artistic purposes B44B; by non-mechanical methods C04B 41/00; non-mechanical after-treatment of single crystals C30B 33/00) [3]
- 5/02 • by rotary tools, e.g. drills
- 5/04 • by tools other than of rotary type, e.g. reciprocating tools
- 7/00 **Accessories specially adapted for use with machines or devices of the other groups of this subclass**
- 7/02 • for removing or laying dust, e.g. by spraying liquids; for cooling work
- 7/04 • for supporting or holding work

## B29 WORKING OF PLASTICS; WORKING OF SUBSTANCES IN A PLASTIC STATE IN GENERAL

### Note(s)

1. This class does not cover the working of plastics sheet material in a manner analogous to the working of paper, which is covered by class B31.
2. In this class, the following term is used with the meaning indicated:
  - "plastics" means macromolecular compounds or compositions based on such compounds.
3. In this class, the following rules apply:
  - a. The working of plastics is, as far as possible, classified primarily according to the particular shaping technique used, e.g. in subclass B29C.
  - b. Classification according to production of particular articles in subclass B29D is restricted to:
    - i. aspects which are characteristic for the production of a particular article, and not classifiable in subclass B29B or B29C;
    - ii. combined operations for making the particular article which are not fully classifiable in subclass B29C.
  - c. Products per se are not classified in this class. However, if a product is characterised by the way it is produced and not by its structure or composition, the production method should be classified in this class.
4. The codes of subclass B29K are only for use as indexing codes associated with subclasses B29B, B29C, or B29D so as to provide information concerning moulding materials or materials for reinforcements, fillers or preformed parts, e.g. inserts.
5. The codes of subclass B29L are only for use as indexing codes associated with subclass B29C, so as to provide information concerning the articles produced by the techniques classified in subclass B29C.

### **B29B PREPARATION OR PRETREATMENT OF THE MATERIAL TO BE SHAPED; MAKING GRANULES OR PREFORMS; RECOVERY OF PLASTICS OR OTHER CONSTITUENTS OF WASTE MATERIAL CONTAINING PLASTICS [4]**

### Note(s)

In this subclass, it is desirable to add the indexing codes of subclass B29K.

### Subclass index

#### PRETREATMENT

Mixing; kneading.....	7/00
Conditioning.....	13/00
Other pretreatment.....	15/00

MAKING GRANULES OR PREFORMS.....9/00, 11/00

RECOVERY OF PLASTICS.....17/00

7/00 **Mixing; Kneading** (in general B01F; combined with

calendering B29C 43/24, with injection B29C 45/46,

## B29B

- with extrusion B29C 47/36) [4]
- 7/02 • non-continuous, with mechanical mixing or kneading devices, i.e. batch type [4]
- 7/04 • • with non-movable mixing or kneading devices [4]
- 7/06 • • with movable mixing or kneading devices [4]
- 7/08 • • • shaking, oscillating or vibrating [4]
- 7/10 • • • rotary [4]
- 7/12 • • • • with single shaft [4]
- 7/14 • • • • • with screw or helix [4]
- 7/16 • • • • • with paddles or arms [4]
- 7/18 • • • • • with more than one shaft [4]
- 7/20 • • • • • with intermeshing devices, e.g. screws [4]
- 7/22 • • Component parts, details or accessories; Auxiliary operations [4]
- 7/24 • • • for feeding [4]
- 7/26 • • • for discharging, e.g. doors [4]
- 7/28 • • • for measuring, controlling or regulating, e.g. viscosity control [4]
- 7/30 • continuous, with mechanical mixing or kneading devices [4]
- 7/32 • • with non-movable mixing or kneading devices [4]
- 7/34 • • with movable mixing or kneading devices [4]
- 7/36 • • • shaking, oscillating or vibrating [4]
- 7/38 • • • rotary (B29B 7/52 takes precedence) [4]
- 7/40 • • • • with single shaft [4]
- 7/42 • • • • • with screw or helix [4]
- 7/44 • • • • • with paddles or arms [4]
- 7/46 • • • • • with more than one shaft [4]
- 7/48 • • • • • with intermeshing devices, e.g. screws [4]
- 7/50 • • • • with rotary casing [4]
- 7/52 • • • with rollers or the like, e.g. calenders [4]
- 7/54 • • • • with a single roller co-operating with a stationary member [4]
- 7/56 • • • • with co-operating rollers [4]
- 7/58 • • Component parts, details or accessories; Auxiliary operations [4]
- 7/60 • • • for feeding, e.g. end guides for the incoming material [4]
- 7/62 • • • Rollers, e.g. with grooves [4]
- 7/64 • • • Stripping the material from the rollers [4]
- 7/66 • • • Recycling the material [4]
- 7/68 • • • Positioning of rollers [4]
- 7/70 • • • Conditioning of rollers, e.g. cleaning [4]
- 7/72 • • • Measuring, controlling or regulating [4]
- 7/74 • using other mixers or combinations of dissimilar mixers [4]
- 7/76 • • with stream impingement mixing head [4]
- 7/78 • • by gravity, e.g. falling particle mixers [4]
- 7/80 • Component parts, details or accessories; Auxiliary operations (B29B 7/22, B29B 7/58 take precedence) [4]
- 7/82 • • Heating or cooling [4]
- 7/84 • • Venting or degassing [4]
- 7/86 • • for working at sub- or superatmospheric pressure [4]

- 7/88 • • Adding charges [4]
- 7/90 • • • Fillers or reinforcements [4]
- 7/92 • • • • Wood chips or wood fibres [4]
- 7/94 • • • Liquid charges [4]
- 9/00 **Making granules** (in general B01J; chemical aspects C08J 3/12) [4]
- 9/02 • by dividing preformed material [4]
- 9/04 • • in the form of plates or sheets [4]
- 9/06 • • in the form of filamentary material, e.g. combined with extrusion [4]
- 9/08 • by agglomerating smaller particles [4]
- 9/10 • by moulding the material, i.e. treating it in the molten state [4]
- 9/12 • characterised by structure or composition [4]
- 9/14 • • fibre-reinforced [4]
- 9/16 • Auxiliary treatment of granules [4]
- 11/00 **Making preforms** (B29C 61/06 takes precedence) [4]
- 11/02 • by dividing preformed material, e.g. sheets, rods [4]
- 11/04 • by assembling preformed material [4]
- 11/06 • by moulding the material [4]
- 11/08 • • Injection moulding [4]
- 11/10 • • Extrusion moulding [4]
- 11/12 • • Compression moulding [4]
- 11/14 • characterised by structure or composition [4]
- 11/16 • • comprising fillers or reinforcements [4]
- 13/00 **Conditioning or physical treatment of the material to be shaped** (chemical aspects C08J 3/00) [4]
- 13/02 • by heating (B29B 13/06, B29B 13/08 take precedence) [4]
- 13/04 • by cooling [4]
- 13/06 • by drying (B29B 13/08 takes precedence) [4]
- 13/08 • by using wave energy or particle radiation [4]
- 13/10 • by grinding, e.g. by triturating; by sieving; by filtering [4]
- 15/00 **Pretreatment of the material to be shaped, not covered by groups B29B 7/00-B29B 13/00** [4]
- 15/02 • of crude rubber, gutta-percha, or similar substances (tapping latex A01G; chemical aspects C08C) [4]
- 15/04 • • Coagulating devices [4]
- 15/06 • • Washing devices [4]
- 15/08 • of reinforcements or fillers (chemical aspects C08J, C08K) [4]
- 15/10 • • Coating or impregnating (applying liquids in general B05) [4]
- 15/12 • • • of reinforcements of indefinite length [4]
- 15/14 • • • • of filaments or wires [4]
- 17/00 **Recovery of plastics or other constituents of waste material containing plastics** (chemical recovery C08J 11/00) [4]
- 17/02 • Separating plastics from other materials [4]
- 17/04 • Disintegrating plastics (B29B 9/02, B29B 11/02, B29B 13/10 take precedence) [2006.01]

**B29C SHAPING OR JOINING OF PLASTICS; SHAPING OF SUBSTANCES IN A PLASTIC STATE, IN GENERAL; AFTER-TREATMENT OF THE SHAPED PRODUCTS, e.g. REPAIRING** (working in the manner of metal B23; grinding, polishing B24; cutting B26D, B26F; making preforms B29B 11/00; making laminated products by combining previously unconnected layers which become one product whose layers will remain together B32B 37/00-B32B 41/00) [4]

**Note(s)**

1. Attention is drawn to Note (3) following the title of class B29.
2. In this subclass:
  - repairing of articles made from plastics or substances in a plastic state, e.g. of articles shaped or produced by using techniques covered by this subclass or subclass B29D, is classified in group B29C 73/00;
  - component parts, details, accessories or auxiliary operations which are applicable to more than one moulding technique are classified in groups B29C 31/00 - B29C 37/00;
  - component parts, details, accessories or auxiliary operations which are only applicable or only of use for one specific shaping technique are classified only in the relevant subgroups of groups B29C 39/00 - B29C 71/00.
3. In this subclass, it is desirable to add the indexing codes of subclasses B29K and B29L.

**Subclass index**

## COMPONENT PARTS, DETAILS ACCESSORIES, AUXILIARY OPERATIONS

Moulds or cores.....	33/00
Heating, cooling, curing.....	35/00
Other features.....	31/00, 37/00

## MOULDING

by casting, by coating a mould.....	39/00, 41/00
Compression moulding.....	43/00
by internal pressure.....	44/00
Injection moulding.....	45/00
Extrusion moulding.....	47/00
Blow-moulding.....	49/00
Thermoforming.....	51/00

## OTHER SHAPING TECHNIQUES

Bending, folding, twisting, straightening, flattening.....	53/00
Stretching.....	55/00
Liberation of internal stresses.....	61/00
Other techniques.....	67/00

## JOINING.....65/00

## PARTICULAR APPLICATIONS

Shaping tube ends.....	57/00
Surface shaping.....	59/00
Lining or sheathing.....	63/00
Shaping composites.....	70/00

## COMBINATIONS OF SHAPING TECHNIQUES.....69/00

## AFTER-TREATMENT.....71/00

## REPAIRING.....73/00

**Component parts, details or accessories; Auxiliary operations [4]****31/00 Handling, e.g. feeding of the material to be shaped (in general B65G) [4]**

- 31/02 • Dispensing from vessels, e.g. hoppers [4]
- 31/04 • Feeding, e.g. into a mould cavity (to presses in general B30B 15/30) [4]
- 31/06 • • in measured doses (in general G01F) [4]
- 31/08 • • of preforms [4]
- 31/10 • • of several materials [4]

**33/00 Moulds or cores; Details thereof or accessories therefor [4]**

- 33/02 • with incorporated heating or cooling means [4]
- 33/04 • • using liquids, gas or steam [4]
- 33/06 • • using radiation [4]
- 33/08 • • for dielectric heating [4]
- 33/10 • with incorporated venting means [4]
- 33/12 • with incorporated means for positioning inserts, e.g. labels [4]
- 33/14 • • against the mould wall [4]
- 33/16 • • • using magnetic means [4]
- 33/18 • • • using vacuum [4]
- 33/20 • Opening, closing or clamping [4]
- 33/22 • • by rectilinear movement [4]

- 33/24 • • • using hydraulic or pneumatic means [4]
- 33/26 • • by pivotal movement [4]
- 33/28 • • • using hydraulic or pneumatic means [4]
- 33/30 • Mounting, exchanging or centering [4]
- 33/32 • • using magnetic means [4]
- 33/34 • movable, e.g. to or from the moulding station [4]
- 33/36 • • continuously movable [4]
- 33/38 • characterised by the material or the manufacturing process (B29C 33/44 takes precedence; manufacture of moulds or parts thereof from metal B22, B23) [4]
- 33/40 • • Plastics, e.g. foam, rubber [4]
- 33/42 • characterised by the shape of the moulding surface, e.g. ribs, grooves [4]
- 33/44 • with means for, or specially constructed to facilitate, the removal of articles, e.g. of undercut articles [4]
- 33/46 • • using fluid pressure [4]
- 33/48 • • with means for collapsing or disassembling [4]
- 33/50 • • • elastic [4]
- 33/52 • • soluble or fusible [4]
- 33/54 • • made of powdered or granular material [4]
- 33/56 • Coatings; Releasing, lubricating or separating agents [4]
- 33/58 • • Applying the releasing agents [4]
- 33/60 • • Releasing, lubricating or separating agents [4]
- 33/62 • • • based on polymers or oligomers [4]

## B29C

- 33/64 • • • • Silicone [4]
- 33/66 • • • • Cellulose; Derivatives thereof [4]
- 33/68 • • Release sheets [4]
- 33/70 • Maintenance [4]
- 33/72 • • Cleaning [4]
- 33/74 • • Repairing [4]
- 33/76 • Cores (B29C 33/02-B29C 33/70 take precedence) [4]

- 35/00 Heating, cooling or curing, e.g. crosslinking, vulcanising; Apparatus therefor** (moulds with incorporated heating or cooling means B29C 33/02; curing devices for plastics dental prostheses A61C 13/14; before moulding B29B 13/00; chemical aspects C08J 3/00) [4]
- 35/02 • Heating or curing, e.g. crosslinking, vulcanising (cold vulcanisation B29C 35/18) [4]
- 35/04 • • using liquids, gas or steam [4]
- 35/06 • • • for articles of indefinite length [4]
- 35/08 • • by wave energy or particle radiation [4]
- 35/10 • • • for articles of indefinite length [4]
- 35/12 • • Dielectric heating [4]
- 35/14 • • • for articles of indefinite length [4]
- 35/16 • Cooling [4]
- 35/18 • Cold vulcanisation [4]
- 37/00 Component parts, details, accessories or auxiliary operations, not covered by group B29C 33/00 or B29C 35/00** [4]
- 37/02 • Deburring or deflashing (by grinding or polishing B24B) [4]
- 37/04 • • of welded articles, e.g. deburring or deflashing in combination with welding [4]

### Particular shaping techniques, e.g. moulding, joining; Apparatus therefor [4]

- 39/00 Shaping by casting, i.e. introducing the moulding material into a mould or between confining surfaces without significant moulding pressure; Apparatus therefor** (B29C 41/00 takes precedence) [4]
- 39/02 • for making articles of definite length, i.e. discrete articles [4]
- 39/04 • • using movable moulds (B29C 41/02 takes precedence) [4]
- 39/06 • • • continuously movable, e.g. along a production line [4]
- 39/08 • • • Introducing the material into the mould by centrifugal force [4]
- 39/10 • • incorporating preformed parts or layers, e.g. casting around inserts or for coating articles [4]
- 39/12 • • Making multilayered or multicoloured articles [4]
- 39/14 • for making articles of indefinite length [4]
- 39/16 • • between endless belts [4]
- 39/18 • • incorporating preformed parts or layers, e.g. casting around inserts or for coating articles [4]
- 39/20 • • Making multilayered or multicoloured articles [4]
- 39/22 • Component parts, details or accessories; Auxiliary operations [4]
- 39/24 • • Feeding the material into the mould [4]
- 39/26 • • Moulds or cores [4]
- 39/28 • • • with means to avoid flashes [4]
- 39/30 • • • with means for cutting the article [4]
- 39/32 • • • with joints or the like for making the mould impervious [4]
- 39/34 • • • for undercut articles [4]
- 39/36 • • Removing moulded articles [4]

- 39/38 • • Heating or cooling [4]
- 39/40 • • Compensating volume change, e.g. retraction [4]
- 39/42 • • Casting under special conditions, e.g. vacuum [4]
- 39/44 • • Measuring, controlling or regulating [4]
- 41/00 Shaping by coating a mould, core or other substrate, i.e. by depositing material and stripping-off the shaped article; Apparatus therefor** (with compacting pressure B29C 43/00) [4]
- 41/02 • for making articles of definite length, i.e. discrete articles [4]
- 41/04 • • Rotational or centrifugal casting, i.e. coating the inside of a mould by rotating the mould [4]
- 41/06 • • • about two or more axes [4]
- 41/08 • • Coating a former, core or other substrate by spraying or fluidisation, e.g. spraying powder [4]
- 41/10 • • • by fluidisation [4]
- 41/12 • • Spreading-out the material on a substrate [4]
- 41/14 • • Dipping a core [4]
- 41/16 • • Slip casting, i.e. applying a slip or slurry on a perforated or porous or absorbent surface with the liquid being drained away [4]
- 41/18 • • Slush casting, i.e. pouring moulding material into a hollow mould with excess material being poured off [4]
- 41/20 • • incorporating preformed parts or layers, e.g. moulding around inserts or for coating articles [4]
- 41/22 • • Making multilayered or multicoloured articles [4]
- 41/24 • for making articles of indefinite length [4]
- 41/26 • • by depositing flowable material on a rotating drum [4]
- 41/28 • • by depositing flowable material on an endless belt [4]
- 41/30 • • incorporating preformed parts or layers, e.g. moulding around inserts or for coating articles [4]
- 41/32 • • Making multilayered or multicoloured articles [4]
- 41/34 • Component parts, details or accessories; Auxiliary operations [4]
- 41/36 • • Feeding the material on to the mould, core or other substrate [4]
- 41/38 • • Moulds, cores or other substrates [4]
- 41/40 • • • Cores [4]
- 41/42 • • Removing articles from moulds, cores or other substrates [4]
- 41/44 • • • Articles of indefinite length [4]
- 41/46 • • Heating or cooling [4]
- 41/48 • • Compensating volume change, e.g. retraction [4]
- 41/50 • • Shaping under special conditions, e.g. vacuum [4]
- 41/52 • • Measuring, controlling or regulating [4]
- 43/00 Compression moulding, i.e. applying external pressure to flow the moulding material; Apparatus therefor** (shaping or impregnating by compression composites comprising reinforcements other than fibres of short length B29C 70/40; presses in general B30B) [4, 6]
- 43/02 • of articles of definite length, i.e. discrete articles [4]
- 43/04 • • using movable moulds [4]
- 43/06 • • • continuously movable [4]
- 43/08 • • • • with circular movement [4]
- 43/10 • • Isostatic pressing, i.e. using non-rigid pressure-exerting members against rigid parts or dies [4]
- 43/12 • • • using bags surrounding the moulding material [4]
- 43/14 • • in several steps [4]
- 43/16 • • Forging [4]

- 43/18 • • incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles [4]
- 43/20 • • Making multilayered or multicoloured articles [4]
- 43/22 • • of articles of indefinite length [4]
- 43/24 • • Calendering [4]
- 43/26 • • in several steps (B29C 43/30 takes precedence) [4]
- 43/28 • • incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles [4]
- 43/30 • • Making multilayered or multicoloured articles [4]
- 43/32 • • Component parts, details or accessories; Auxiliary operations [4]
- 43/34 • • Feeding the material to the mould or the compression means [4]
- 43/36 • • Moulds for making articles of definite length, i.e. discrete articles [4]
- 43/38 • • • with means to avoid flashes [4]
- 43/40 • • • with means for cutting the article [4]
- 43/42 • • • for undercut articles [4]
- 43/44 • • Compression means for making articles of indefinite length [4]
- 43/46 • • • Rollers [4]
- 43/48 • • • Endless belts [4]
- 43/50 • • Removing moulded articles [4]
- 43/52 • • Heating or cooling [4]
- 43/54 • • Compensating volume change, e.g. retraction [4]
- 43/56 • • Compression moulding under special conditions, e.g. vacuum [4]
- 43/58 • • Measuring, controlling or regulating [4]
- 44/00 Shaping by internal pressure generated in the material, e.g. swelling, foaming [6]**
- 44/02 • • for articles of definite length, i.e. discrete articles [6]
- 44/04 • • consisting of at least two parts of chemically or physically different materials, e.g. having different densities [6]
- 44/06 • • • Making multilayered articles [6]
- 44/08 • • using several expanding steps [6]
- 44/10 • • Applying counter-pressure during expanding [6]
- 44/12 • • Incorporating or moulding on preformed parts, e.g. inserts, reinforcements [6]
- 44/14 • • • the preformed part being a lining [6]
- 44/16 • • • shaped by the expansion of the material [6]
- 44/18 • • • Filling preformed cavities [6]
- 44/20 • • for articles of indefinite length [6]
- 44/22 • • consisting of at least two parts of chemically or physically different materials, e.g. having different densities [6]
- 44/24 • • • Making multilayered articles [6]
- 44/26 • • using several expanding steps [6]
- 44/28 • • Expanding the moulding material on continuous moving surfaces [6]
- 44/30 • • Expanding the moulding material between endless belts or rollers [6]
- 44/32 • • Incorporating or moulding on preformed parts, e.g. linings, inserts, reinforcements [6]
- 44/34 • • Component parts, details or accessories; Auxiliary operations [6]
- 44/36 • • Feeding the material to be shaped [6]
- 44/38 • • • into a closed space, i.e. to make articles of definite length [6]
- 44/40 • • • • by gravity, e.g. by casting [6]
- 44/42 • • • • using pressure difference, e.g. by injection, by vacuum [6]
- 44/44 • • • • in the form of expandable particles or beads [6]
- 44/46 • • • into an open space or onto moving surfaces, i.e. to make articles of indefinite length [6]
- 44/48 • • • • by gravity, e.g. casting onto, or between, moving surfaces [6]
- 44/50 • • • • using pressure difference, e.g. by extrusion, by spraying [6]
- 44/52 • • • • • between moving surfaces [6]
- 44/54 • • • • in the form of expandable particles or beads [6]
- 44/56 • • After-treatment of articles, e.g. for altering the shape [6]
- 44/58 • • Moulds [6]
- 44/60 • • Measuring, controlling or regulating [6]
- 45/00 Injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould; Apparatus therefor (injection blow-moulding B29C 49/06) [4]**
- 45/02 • • Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity [4]
- 45/03 • • Injection moulding apparatus (transfer moulding B29C 45/02) [4]
- 45/04 • • • using movable moulds (B29C 45/08 takes precedence) [4]
- 45/06 • • • on a turntable [4]
- 45/07 • • using movable injection units [4]
- 45/08 • • • moving with the mould during the injection operation [4]
- 45/10 • • using moulds or injection units usable in different arrangements or combinations to each other [4]
- 45/12 • • using two or more fixed moulds, e.g. in tandem [4]
- 45/13 • • using two or more injection units co-operating with a single mould [4]
- 45/14 • • incorporating preformed parts or layers, e.g. injection moulding around inserts or for coating articles [4]
- 45/16 • • Making multilayered or multicoloured articles [4]
- 45/17 • • Component parts, details or accessories; Auxiliary operations [4]
- 45/18 • • Feeding the material into the injection moulding apparatus [4]
- 45/20 • • Injection nozzles [4]
- 45/22 • • • Multiple nozzle systems [4]
- 45/23 • • • Feed stopping equipment [4]
- 45/24 • • • Cleaning equipment [4]
- 45/26 • • Moulds [4]
- 45/27 • • • Sprue channels [4]
- 45/28 • • • • Closure devices therefor [4]
- 45/30 • • • • Flow control means disposed within the sprue channel, e.g. "torpedo" construction [4]
- 45/32 • • • having several axially spaced mould cavities [4]
- 45/33 • • • having transversely, e.g. radially, movable mould parts [4]
- 45/34 • • • having venting means [4]
- 45/36 • • • having means for locating or centering cores [4]
- 45/37 • • • Mould cavity walls [4]
- 45/38 • • Cutting-off equipment for sprues or ingates [4]
- 45/40 • • Removing or ejecting moulded articles [4]
- 45/42 • • • using means movable from outside the mould between mould parts [4]
- 45/43 • • • using fluid under pressure [4]
- 45/44 • • • for undercut articles [4]

- 45/46 • • Means for plasticising or homogenising the moulding material or forcing it into the mould [4]
- 45/47 • • • using screws (B29C 45/54 takes precedence) [4]
- 45/48 • • • • Plasticising screw and injection screw [4]
- 45/50 • • • • Axially movable screw [4]
- 45/52 • • • • • Non-return devices [4]
- 45/53 • • • using injection ram or piston [4]
- 45/54 • • • • and plasticising screw [4]
- 45/56 • • • using mould parts movable during or after injection, e.g. injection-compression moulding [4]
- 45/57 • • • Exerting after-pressure on the moulding material [4]
- 45/58 • • • Details [4]
- 45/60 • • • • Screws [4]
- 45/62 • • • • Barrels or cylinders [4]
- 45/63 • • • • Venting or degassing means [4]
- 45/64 • • Mould opening, closing or clamping devices [4]
- 45/66 • • • mechanical [4]
- 45/67 • • • hydraulic [4]
- 45/68 • • • hydro-mechanical [4]
- 45/70 • • Means for plasticising or homogenising the moulding material or forcing it into the mould, combined with mould opening, closing or clamping devices [4]
- 45/72 • • Heating or cooling [4]
- 45/73 • • • of the mould [4]
- 45/74 • • • of the injection unit [4]
- 45/76 • • Measuring, controlling or regulating [4]
- 45/77 • • • of velocity or pressure of moulding material [4]
- 45/78 • • • of temperature [4]
- 45/80 • • • of relative position of mould parts [4]
- 45/82 • • • Hydraulic circuits [4]
- 45/83 • • Lubricating means [4]
- 45/84 • • Safety devices [4]
- 47/00 Extrusion moulding, i.e. expressing the moulding material through a die or nozzle which imparts the desired form; Apparatus therefor** (extrusion blow-moulding B29C 49/04; extrusion presses in general B30B 11/22) [4]
- 47/02 • incorporating preformed parts or layers, e.g. extrusion moulding around inserts or for coating articles [4]
- 47/04 • of multilayered or multicoloured articles [4]
- 47/06 • • Multilayered articles [4]
- 47/08 • Component parts, details or accessories; Auxiliary operations [4]
- 47/10 • • Feeding the material to the extruder [4]
- 47/12 • • Extrusion nozzles or dies [4]
- 47/14 • • • with broad opening, e.g. for sheets [4]
- 47/16 • • • • adjustable [4]
- 47/18 • • • • with die parts oscillating relative to each other [4]
- 47/20 • • • with annular opening, e.g. for tubular articles [4]
- 47/22 • • • • adjustable [4]
- 47/24 • • • • with die parts rotatable relative to each other [4]
- 47/26 • • • • Multiple annular extrusion nozzles [4]
- 47/28 • • • • Cross-head annular extrusion nozzles [4]
- 47/30 • • • Multi-port extrusion nozzles [4]
- 47/32 • • • Roller-extrusion nozzles [4]
- 47/34 • • Conveyers for extruded material [4]

- 47/36 • • Means for plasticising or homogenising the moulding material or forcing it through the nozzle or die [4]
- 47/38 • • • using screws [4]
- 47/40 • • • • using at least two intermeshing screws [4]
- 47/42 • • • • • using sub-screws, e.g. planetary screws [4]
- 47/44 • • • • using axially movable screws [4]
- 47/46 • • • • using screws extruding in opposite directions [4]
- 47/48 • • • • using screws arranged coaxially, one within the other [4]
- 47/50 • • • • using at least two screws, one after the other, e.g. multi-stage plasticisers [4]
- 47/52 • • • using rollers or discs [4]
- 47/54 • • • using press rams or pistons [4]
- 47/56 • • • using more than one extruder to feed one die [4]
- 47/58 • • • Details [4]
- 47/60 • • • • Screws [4]
- 47/62 • • • • • having more than one screw-thread [4]
- 47/64 • • • • • having incorporated mixing devices [4]
- 47/66 • • • • Barrels or cylinders [4]
- 47/68 • • • • Filters [4]
- 47/70 • • • • Flow dividers [4]
- 47/72 • • • • Feedback means [4]
- 47/74 • • • • By-pass means [4]
- 47/76 • • • • Venting or degassing means [4]
- 47/78 • • Heating or cooling the material to be extruded or the stream of extruded material [4]
- 47/80 • • • at plasticising zone [4]
- 47/82 • • • • Heating the cylinders [4]
- 47/84 • • • • Heating the screws [4]
- 47/86 • • • at nozzle zone [4]
- 47/88 • • • Heating or cooling the stream of extruded material [4]
- 47/90 • • • • with calibration or sizing [4]
- 47/92 • • Measuring, controlling or regulating [4]
- 47/94 • • Lubricating [4]
- 47/96 • • Safety devices [4]
- 49/00 Blow-moulding, i.e. blowing a preform or parison to a desired shape within a mould; Apparatus therefor** [4]
- 49/02 • Combined blow-moulding and manufacture of the preform or the parison [4]
- 49/04 • • Extrusion blow-moulding [4]
- 49/06 • • Injection blow-moulding [4]
- 49/08 • Biaxial stretching during blow-moulding [4]
- 49/10 • • using mechanical means [4]
- 49/12 • • • Stretching rods [4]
- 49/14 • • • Clamps [4]
- 49/16 • • using pressure difference, e.g. pre-blowing [4]
- 49/18 • using several blowing steps (B29C 49/16 takes precedence) [4]
- 49/20 • of articles having inserts or reinforcements [4]
- 49/22 • using multilayered preforms or parisons [4]
- 49/24 • Lining or labelling [4]
- 49/26 • • inner lining of tubes [4]
- 49/28 • Blow-moulding apparatus [4]
- 49/30 • • having movable moulds or mould parts [4]
- 49/32 • • • moving "to and fro" [4]
- 49/34 • • • • the mould parts moving "hand-over-hand" [4]
- 49/36 • • • rotatable about one axis [4]

- 49/38 • • • mounted on movable endless supports [4]
- 49/40 • • • • on co-operating drums [4]
- 49/42 • Component parts, details or accessories; Auxiliary operations [4]
- 49/44 • • for applying pressure through the walls of an inflated bag [4]
- 49/46 • • characterised by using particular environment or blow fluids other than air [4]
- 49/48 • • Moulds [4]
- 49/50 • • • having cutting or deflashing means [4]
- 49/52 • • • having decorating or printing means [4]
- 49/54 • • • for undercut articles [4]
- 49/56 • • Opening, closing or clamping means [4]
- 49/58 • • Blowing means [4]
- 49/60 • • • Blow-needles [4]
- 49/62 • • Venting means [4]
- 49/64 • • Heating or cooling preforms, parisons or blown articles [4]
- 49/66 • • • Cooling by refrigerant introduced into the blown article [4]
- 49/68 • • • Ovens specially adapted for heating preforms or parisons [4]
- 49/70 • • Removing or ejecting blown articles from the mould [4]
- 49/72 • • Deflashing outside the mould [4]
- 49/74 • • • Deflashing the neck portion [4]
- 49/76 • • Neck calibration [4]
- 49/78 • • Measuring, controlling or regulating [4]
- 49/80 • • • Testing, e.g. for leaks [4]
- 51/00 Shaping by thermoforming, e.g. shaping sheets in matched moulds or by deep-drawing; Apparatus therefor [4]**
- 51/02 • Combined thermoforming and manufacture of the preform [4]
- 51/04 • Combined thermoforming and prestretching, e.g. biaxial stretching [4]
- 51/06 • • using pressure difference [4]
- 51/08 • Deep-drawing or matched-mould forming, i.e. using mechanical means only [4]
- 51/10 • Forming by pressure difference, e.g. vacuum [4]
- 51/12 • of articles having inserts or reinforcements [4]
- 51/14 • using multilayered preforms or sheets [4]
- 51/16 • Lining or labelling [4]
- 51/18 • Thermoforming apparatus [4]
- 51/20 • • having movable moulds or mould parts [4]
- 51/22 • • • rotatable about an axis [4]
- 51/24 • • • mounted on movable endless supports [4]
- 51/26 • Component parts, details or accessories; Auxiliary operations [4]
- 51/28 • • for applying pressure through the wall of an inflated bag or diaphragm [4]
- 51/30 • • Moulds [4]
- 51/32 • • • having cutting means [4]
- 51/34 • • • for undercut articles [4]
- 51/36 • • • specially adapted for vacuum forming [4]
- 51/38 • • • Opening, closing or clamping means [4]
- 51/40 • • • Venting means [4]
- 51/42 • • Heating or cooling [4]
- 51/44 • • Removing or ejecting moulded articles [4]
- 51/46 • • Measuring, controlling or regulating [4]
- 53/00 Shaping by bending, folding, twisting, straightening or flattening; Apparatus therefor (B29C 61/10 takes precedence) [4]**
- 53/02 • Bending or folding (B29C 53/22, B29C 53/34, B29C 53/36, B29C 53/56 take precedence) [4]
- 53/04 • • of plates or sheets [4]
- 53/06 • • • Forming folding lines by pressing or scoring [4]
- 53/08 • • of tubes [4]
- 53/10 • • • of blown tubular films, e.g. gusseting [4]
- 53/12 • • helically, e.g. for making springs [4]
- 53/14 • Twisting [4]
- 53/16 • Straightening or flattening [4]
- 53/18 • • of plates or sheets [4]
- 53/20 • • of tubes [4]
- 53/22 • Corrugating [4]
- 53/24 • • of plates or sheets [4]
- 53/26 • • • parallel with direction of feed [4]
- 53/28 • • • transverse to direction of feed [4]
- 53/30 • • of tubes (by blow-moulding B29C 49/00) [4]
- 53/32 • Coiling (B29C 53/56 takes precedence) [4]
- 53/34 • Rim rolling (of tube ends B29C 57/12) [4]
- 53/36 • Bending and joining, e.g. for making hollow articles (B29C 53/56 takes precedence; from paper B31C) [4]
- 53/38 • • by bending sheets or strips at right angles to the longitudinal axis of the article being formed and joining the edges [4]
- 53/40 • • • for articles of definite length, i.e. discrete articles [4]
- 53/42 • • • • using internal forming surfaces, e.g. mandrels [4]
- 53/44 • • • • • rotatable about the axis of the article [4]
- 53/46 • • • • using external forming surfaces, e.g. sleeves [4]
- 53/48 • • • for articles of indefinite length, i.e. bending a strip progressively [4]
- 53/50 • • • • using internal forming surfaces, e.g. mandrels [4]
- 53/52 • • • • using external forming surfaces, e.g. sleeves [4]
- 53/54 • • • • Guiding, aligning or shaping edges [4]
- 53/56 • Winding and joining, e.g. winding spirally [4]
- 53/58 • • helically [4]
- 53/60 • • • using internal forming surfaces, e.g. mandrels [4]
- 53/62 • • • • rotatable about the winding axis [4]
- 53/64 • • • • • and moving axially [4]
- 53/66 • • • • • with axially movable winding feed member [4]
- 53/68 • • • • • with rotatable winding feed member [4]
- 53/70 • • • • • and moving axially [4]
- 53/72 • • • using external forming surfaces [4]
- 53/74 • • • using a forming surface in the shape of an endless belt which is recycled after the forming operation [4]
- 53/76 • • • about more than one axis [4]
- 53/78 • • • using profiled sheets or strips [4]
- 53/80 • Component parts, details or accessories; Auxiliary operations [4]
- 53/82 • • Cores or mandrels [4]
- 53/84 • • Heating or cooling [4]
- 55/00 Shaping by stretching, e.g. drawing through a die; Apparatus therefor (B29C 61/08 takes precedence) [4]**
- 55/02 • of plates or sheets [4]
- 55/04 • • uniaxial, e.g. oblique [4]
- 55/06 • • • parallel with the direction of feed [4]
- 55/08 • • • transverse to the direction of feed [4]
- 55/10 • • multiaxial [4]

- 55/12 • • • biaxial [4]
- 55/14 • • • successively [4]
- 55/16 • • • simultaneously [4]
- 55/18 • • by squeezing between surfaces, e.g. rollers [4]
- 55/20 • • Edge clamps [4]
- 55/22 • of tubes [4]
- 55/24 • • radial [4]
- 55/26 • • biaxial [4]
- 55/28 • of blown tubular films, e.g. by inflation [4]
- 55/30 • Drawing through a die [4]

**57/00 Shaping of tube ends, e.g. flanging, belling, closing; Apparatus therefor [4]**

- 57/02 • Belling or enlarging, e.g. combined with forming a groove [4]
- 57/04 • • using mechanical means [4]
- 57/06 • • • elastically deformable [4]
- 57/08 • • using pressure difference [4]
- 57/10 • Closing [4]
- 57/12 • Rim rolling [4]

**59/00 Surface shaping, e.g. embossing; Apparatus therefor [4]**

- 59/02 • by mechanical means, e.g. pressing [4]
- 59/04 • • using rollers or endless belts [4]
- 59/06 • • using vacuum drums [4]
- 59/08 • by flame treatment [4]
- 59/10 • by electric discharge treatment (electrodes H01T) [4]
- 59/12 • • in an environment other than air [4]
- 59/14 • by plasma treatment (in general H05H) [4]
- 59/16 • by wave energy or particle radiation [4]
- 59/18 • by liberation of internal stresses, e.g. plastic memory [4]

**61/00 Shaping by liberation of internal stresses; Making preforms having internal stresses; Apparatus therefor** (for surface shaping B29C 59/18; for lining articles B29C 63/38; for joining preformed parts B29C 65/66) [4]

- 61/02 • Thermal shrinking [4]
- 61/04 • Thermal expansion [4]
- 61/06 • Making preforms having internal stresses, e.g. plastic memory [4]
- 61/08 • • by stretching tubes [4]
- 61/10 • • by bending plates or sheets [4]

**63/00 Lining or sheathing, i.e. applying preformed layers or sheathings of plastics; Apparatus therefor** (B29C 73/00 takes precedence; by blowing B29C 49/00; by thermoforming B29C 51/00) [4, 5]

- 63/02 • using sheet or web-like material (B29C 63/26 takes precedence) [4]
- 63/04 • • by folding, winding, bending or the like [4]
- 63/06 • • • around tubular articles [4]
- 63/08 • • • by winding helically [4]
- 63/10 • • • • around tubular articles [4]
- 63/12 • • • by winding spirally [4]
- 63/14 • • • • around tubular articles [4]
- 63/16 • • applied by "rubber" bag or diaphragm [4]
- 63/18 • using tubular layers or sheathings (B29C 63/26 takes precedence) [4]
- 63/20 • • using pressure difference, e.g. vacuum [4]
- 63/22 • using layers or sheathings having a shape adapted to the shape of the article (B29C 63/26 takes precedence) [4]
- 63/24 • using threads [4]

- 63/26 • Lining or sheathing of internal surfaces (B29C 63/38 takes precedence) [4]
- 63/28 • • applied by "rubber" bag or diaphragm [4]
- 63/30 • • using sheet or web-like material [4]
- 63/32 • • • by winding helically [4]
- 63/34 • • using tubular layer or sheathings [4]
- 63/36 • • • being turned inside out [4]
- 63/38 • by liberation of internal stresses [4]
- 63/40 • • using sheet or web-like material [4]
- 63/42 • • using tubular layers or sheathings [4]
- 63/44 • • the shape of the layers or sheathings being adapted to the shape of the articles [4]
- 63/46 • • of internal surfaces [4]
- 63/48 • Preparation of the surfaces [4]

**65/00 Joining of preformed parts; Apparatus therefor** (for making boxes, cartons, envelopes or bags B31B; for sealing or securing package folds or closures B65B 51/00; joining constructional elements, in general F16B; splicing of light guides G02B 6/255) [4, 5]

- 65/02 • by heating, with or without pressure [4]
- 65/04 • • Dielectric heating, e.g. high-frequency welding [4]
- 65/06 • • using friction, e.g. spin welding [4]
- 65/08 • • using ultrasonic vibrations [4]
- 65/10 • • using hot gases [4]
- 65/12 • • • and welding bar [4]
- 65/14 • • using wave energy or particle radiation [4]
- 65/16 • • • Laser beam [4]
- 65/18 • • using heated tool [4]
- 65/20 • • • with direct contact, e.g. using "mirror" [4]
- 65/22 • • • Heated wire [4]
- 65/24 • • characterised by the means for heating the tool [4]

**Note(s)**

Classification is made in this group only if the details or adaptations of the heating means are of interest.

- 65/26 • • • • Hot fluid [4]
- 65/28 • • • • Flame or combustible material [4]
- 65/30 • • • • Electrical means [4]
- 65/32 • • • • • Induction [4]
- 65/34 • • using heated elements which remain in the joint, e.g. "verlorenes Schweisselement" [4]
- 65/36 • • • heated by induction [4]
- 65/38 • • Impulse heating [4]
- 65/40 • • Applying molten plastics, e.g. hot melt (using welding bar B29C 65/12; by moulding B29C 65/70) [4]
- 65/42 • • • between pre-assembled parts [4]
- 65/44 • • Joining a heated non-plastics element to a plastics element [4]
- 65/46 • • • heated by induction [4]
- 65/48 • using adhesives (heat-activated B29C 65/02; hot melts B29C 65/40; non-mechanical parts of adhesive processes, in general C09J 5/00) [4]
- 65/50 • • using adhesive tape [4]
- 65/52 • • Applying the adhesive [4]
- 65/54 • • • between pre-assembled parts [4]
- 65/56 • using mechanical means [4]
- 65/58 • • Snap connection [4]
- 65/60 • • Riveting [4]
- 65/62 • • Stitching [4]
- 65/64 • • Joining a non-plastics element to a plastics element, e.g. by force (B29C 65/44 takes precedence) [4]



- 65/66 • by liberation of internal stresses, e.g. shrinking of one of the parts to be joined [4]
- 65/68 • • using auxiliary shrinkable element [4]
- 65/70 • by moulding (using a particular moulding technique, see the relevant place for that technique) [4]
- 65/72 • by combined operations, e.g. welding and stitching [4]
- 65/74 • by welding and severing [4]
- 65/76 • Making non-permanent or releasable joints [4]
- 65/78 • Means for handling the parts to be joined, e.g. for making containers or hollow articles [4]
- 65/80 • • Rotatable transfer means [4]
- 65/82 • Testing the joint [4]

**67/00 Shaping techniques not covered by groups B29C 39/00-B29C 65/00, B29C 70/00 or B29C 73/00 [4, 6]**

- 67/02 • Moulding by agglomerating [4]
- 67/04 • • Sintering (combined with compression B29C 43/00) [4]
- 67/06 • • Coagulating [4]
- 67/08 • Screen moulding, e.g. forcing the moulding material through a perforated screen on to a moulding surface [4]
- 67/20 • for porous or cellular articles, e.g. of foam plastics, coarse-pored [4]
- 67/24 • characterised by the choice of material [4]

**69/00 Combinations of shaping techniques not provided for in a single one of main groups B29C 39/00-B29C 67/00, e.g. associations of moulding and joining techniques; Apparatus therefor [4]**

- 69/02 • of moulding techniques only [4]

**70/00 Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts (chemical aspects C08, e.g. C08J 5/00) [6]**

**Note(s)**

In this group, the following terms or expressions are used with the meanings indicated:

- "reinforcement" means a structure in the form of fibres, wires, rods, bars, sections, plates or blocks, which improves the strength of an article;
- "filler" means a relatively inert substance in the form of particles, powder, beads, flakes or spheres, which improves the physical properties or increases the bulk or weight of an article;
- "preformed part" means a part made of any material, being completely shaped to have a determined form and which is not used as a reinforcement, e.g. wires or nets forced only into the surface of an article;
- "insert" means a preformed part incorporated in an article during moulding.

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- 70/02 • comprising combinations of reinforcements and fillers incorporated in matrix material, forming one or more layers, with or without non-reinforced or non-filled layers [6]
  - 70/04 • comprising reinforcements only, e.g. self-reinforcing plastics [6]
  - 70/06 • • Fibrous reinforcements only [6]

- 70/08 • • • comprising combinations of different forms of fibrous reinforcements incorporated in matrix material, forming one or more layers, with or without non-reinforced layers [6]
- 70/10 • • • characterised by the structure of fibrous reinforcements [6]
- 70/12 • • • • using fibres of short length, e.g. in the form of a mat [6]
- 70/14 • • • • • oriented (oriented filler material B29C 70/62) [6]
- 70/16 • • • • using fibres of substantial or continuous length [6]
- 70/18 • • • • • in the form of a mat, e.g. sheet moulding compound (SMC) [6]
- 70/20 • • • • • oriented in a single direction, e.g. roving or other parallel fibres [6]
- 70/22 • • • • • oriented in at least two directions forming a two dimensional structure [6]
- 70/24 • • • • • oriented in at least three directions forming a three dimensional structure [6]
- 70/26 • • Non-fibrous reinforcements only [6]
- 70/28 • • Shaping operations therefor [6]

**Note(s)**

1. This group covers:
  - the shaping of coherent fibrous reinforcements which are pre-impregnated or without binder, or of non-coherent reinforcements of fibres placed in a mould or on a support;
  - the impregnation or introduction of a plastics matrix in reinforcements during shaping.
2. This group does not cover:
  - the moulding by a single technique of plastics matrix material mixed with and containing reinforcing fibres of short length, which is covered by the appropriate place for that technique;
  - the pretreatment, e.g. impregnation, of reinforcements per se, i.e. independently of their shaping, which is covered by group B29B 15/08.

- 70/30 • • • Shaping by lay-up, i.e. applying fibres, tape or broadsheet on a mould, former or core; Shaping by spray-up, i.e. spraying of fibres on a mould, former or core [6]
- 70/32 • • • • on a rotating mould, former or core [6]
- 70/34 • • • • and shaping or impregnating by compression [6]
- 70/36 • • • • and impregnating by casting, e.g. vacuum casting [6]
- 70/38 • • • • Automated lay-up, e.g. using robots, laying filaments according to predetermined patterns [6]
- 70/40 • • • Shaping or impregnating by compression (B29C 70/34 takes precedence) [6]
- 70/42 • • • • for producing articles of definite length, i.e. discrete articles [6]
- 70/44 • • • • • using isostatic pressure, e.g. pressure difference-, vacuum bag-, autoclave- or expanding rubber-moulding [6]
- 70/46 • • • • • using matched moulds, e.g. for deforming sheet moulding compounds (SMC), prepregs [6]
- 70/48 • • • • • and impregnating the reinforcements in the closed mould, e.g. resin transfer moulding (RTM) [6]

## B29C

- 70/50 • • • • for producing articles of indefinite length, e.g. prepregs, sheet moulding compounds (SMC), cross moulding compounds (XMC) [6]
- 70/52 • • • • • Pultrusion, i.e. forming and compressing by continuously pulling through a die [6]
- 70/54 • • • Component parts, details or accessories; Auxiliary operations [6]
- 70/56 • • • • Tensioning reinforcements before or during shaping [6]
- 70/58 • comprising fillers only [6]

### Note(s)

Moulding of plastics matrix material mixed with fillers by a single technique is classified in the appropriate place for that technique.

- 70/60 • • comprising a combination of distinct filler types incorporated in matrix material, forming one or more layers, and with or without non-filled layers [6]
- 70/62 • • the filler being oriented during moulding (for fibres of short length B29C 70/14) [6]
- 70/64 • • the filler influencing the surface characteristics of the material, e.g. by concentrating near the surface or by incorporation into the surface by force [6]
- 70/66 • • the filler comprising hollow constituents, e.g. syntactic foam [6]
- 70/68 • by incorporating or moulding on preformed parts, e.g. inserts, layers [6]

### Note(s)

This group **does not cover**:

- incorporating, or moulding on, preformed parts by a single technique, which is covered by the appropriate place for that technique;
  - pretreatment of preformed parts *per se*, i.e. independently of their shaping, which is covered by group B29B 15/00.
- 70/70 • • Completely encapsulating inserts [6]
  - 70/72 • • Encapsulating inserts having non-encapsulated projections, e.g. extremities, terminal portions of electrical components [6]
  - 70/74 • • Moulding material on a relatively small portion of the preformed part, e.g. outsert moulding [6]
  - 70/76 • • • Moulding on edges or extremities of the preformed part [6]
  - 70/78 • • Moulding material on one side only of the preformed part [6]
  - 70/80 • • • Moulding sealing material into closure members [6]
  - 70/82 • • Forcing wires, nets or the like partially or completely into the surface of an article, e.g. by cutting and pressing (pressing beads or the like into a surface B29C 70/64) [6]

- 70/84 • • Moulding material on preformed parts to be joined [6]
- 70/86 • • Incorporating in coherent impregnated reinforcing layers [6]
- 70/88 • characterised primarily by possessing specific properties, e.g. electrically conductive, locally reinforced [6]

**71/00 After-treatment of articles without altering their shape; Apparatus therefor** (B29C 44/56, B29C 73/00 take precedence; surface shaping B29C 59/00; chemical aspects C08J 7/00) [4, 5, 6]

- 71/02 • Thermal after-treatment [4]
- 71/04 • by wave energy or particle radiation [4]

**73/00 Repairing of articles made from plastics or substances in a plastic state, e.g. of articles shaped or produced by using techniques covered by this subclass or subclass B29D** (retreading tyres B29D 30/54; devices for covering leaks in pipes or hoses F16L 55/16) [5]

- 73/02 • using liquid or paste-like material (B29C 73/16 takes precedence) [5]
- 73/04 • using preformed elements [5]
- 73/06 • • using plugs sealing in the hole [5]
- 73/08 • • • Apparatus therefor, e.g. for inserting [5]
- 73/10 • • using patches sealing on the surface of the article (B29C 73/14 takes precedence) [5]
- 73/12 • • • Apparatus therefor, e.g. for applying (B29C 73/30 takes precedence) [5]
- 73/14 • • using elements composed of two parts joined together after having been placed one on each side of the article [5]
- 73/16 • Auto-repairing or self-sealing arrangements or agents (sealing compositions, *see* Section C, e.g. C09K 3/10) [5]
- 73/18 • • the article material itself being self-sealing, e.g. by compression [5]
- 73/20 • • • the article material only consisting in part of a deformable sealing material [5]
- 73/22 • • the article containing elements including a sealing composition, e.g. powder being liberated when the article is damaged [5]
- 73/24 • Apparatus or accessories not otherwise provided for [5]
- 73/26 • • for mechanical pretreatment [5]
- 73/28 • • for clamping and stretching flexible material, e.g. inner tubes [5]
- 73/30 • • for local pressing or local heating [5]
- 73/32 • • • using an elastic element, e.g. inflatable bag [5]
- 73/34 • • • for local heating [5]

**B29D PRODUCING PARTICULAR ARTICLES FROM PLASTICS OR FROM SUBSTANCES IN A PLASTIC STATE** (making granules B29B 9/00; making preforms B29B 11/00) [4]

### Note(s)

1. Attention is drawn to Note (3) following the title of class B29.
2. In this subclass, it is desirable to add the indexing codes of subclass B29K.

**1/00 Producing articles provided with screw threads**

**5/00 Producing elements of slide fasteners; Combined**

	<b>making and attaching of elements of slide fasteners [4]</b>	29/06	• Conveyer belts [4]
5/02	• the fasteners having separate interlocking members [4]	29/08	• Toothed driving belts [4]
5/04	• the interlocking members being formed by continuous meander of filamentary material [4]	29/10	• Driving belts having wedge-shaped cross-section [4]
5/06	• the interlocking members being formed by continuous helix [4]		
5/08	• the interlocking members being formed by profiled or castellated edge of a stringer [4]	<b>30/00</b>	<b>Producing pneumatic or solid tyres or parts thereof</b> (producing inner tubes B29D 23/24; constructional form of tyres or parts thereof B60C; connection of valves to inflatable elastic bodies B60C 29/00; testing of tyres G01M 17/02) [4]
5/10	• the interlocking members being formed by continuous profiled strip [4]	30/02	• Solid tyres [4]
		30/04	• Resilient fillings for rubber tyres; Filling tyres therewith [4]
<b>7/00</b>	<b>Producing flat articles, e.g. films or sheets</b> (B29D 24/00 takes precedence) [4]	30/06	• Pneumatic tyres or parts thereof [4]
7/01	• Films or sheets [4]	30/08	• • Building tyres [4]
		30/10	• • • on round cores, i.e. the shape of the core is approximately identical with the shape of the completed tyre [4]
<b>11/00</b>	<b>Producing optical elements, e.g. lenses, prisms</b> (grinding or polishing of optical elements B24B; constructional form of optical elements G02B) [4]	30/12	• • • • Cores [4]
11/02	• Artificial eyes from organic plastic material	30/14	• • • • Rolling-down or pressing-down the layers in the building process [4]
<b>12/00</b>	<b>Producing frames</b>	30/16	• • • • Applying the layers; Guiding or stretching the layers during application [4]
12/02	• Spectacle frames (constructional form G02C)	30/18	• • • • Fitting the bead-rings or bead-cores; Folding the textile layers around the rings or cores [4]
<b>15/00</b>	<b>Producing gear wheels or similar articles with grooves or projections, e.g. control knobs</b>	30/20	• • • • by the flat-tyre method, i.e. building on cylindrical drums [4]
<b>16/00</b>	<b>Producing articles with corrugations</b> (B29D 23/18 takes precedence) [4]	30/22	• • • • Breaker plies being applied in the unexpanded state [4]
		30/24	• • • • Drums [4]
<b>17/00</b>	<b>Producing carriers of records containing fine grooves or impressions, e.g. disc records for needle playback, cylinder records</b> (recording sound or other information using formed grooves or the equivalent G11B); <b>Producing record discs from master stencils</b> [4, 6]	30/26	• • • • • Accessories or details, e.g. membranes, transferrings [4]
		30/28	• • • • Rolling-down or pressing-down the layers in the building process [4]
<b>19/00</b>	<b>Producing buttons or semi-finished parts of buttons</b>	30/30	• • • • Applying the layers; Guiding or stretching the layers during application [4]
19/04	• by cutting, milling, turning, stamping, or perforating moulded parts; Surface treatment of buttons	30/32	• • • • Fitting the bead-rings or bead-cores; Folding the textile layers around the rings or cores [4]
19/06	• • Devices for feeding semi-finished parts to the processing machines	30/34	• • • • by jointly covering two bead-rings, located parallel to each other at a distance apart, with fabric or cord layers [4]
19/08	• • Making holes in buttons or in semi-finished parts thereof	30/36	• • Expansion of tyres in a flat form, e.g. of tyres built by the flat-tyre method or by jointly covering two bead-rings [4]
<b>21/00</b>	<b>Producing hair combs or similar toothed or slotted articles</b>	30/38	• • Textile inserts, e.g. cord or canvas layers, for tyres (making woven fabrics D03D); Treatment of inserts prior to building the tyre (pretreatment of inserts B29B 15/00; manufacture of layers comprising fibrous parallel reinforcements of substantial or continuous length B29C 70/20) [4]
21/04	• by sawing, milling, cutting, or similar operations	30/40	• • • Chemical pretreatment of textile inserts before building the tyre [4]
21/06	• Polishing	30/42	• • • Endless textile bands without bead-rings [4]
<b>22/00</b>	<b>Producing hollow articles</b> (tubular articles B29D 23/00; pneumatic tyres B29D 30/00) [4]	30/44	• • • Stretching or treating the layers before application on the drum (during application B29D 30/30) [4]
22/02	• Inflatable articles [7]	30/46	• • • Cutting textile inserts to required shape [4]
22/04	• Spherical articles, e.g. balls (B29D 22/02 takes precedence) [7]	30/48	• • • Bead-rings or bead-cores (from wire B21F 37/00); Treatment thereof prior to building the tyre [4]
<b>23/00</b>	<b>Producing tubular articles</b> (B29D 24/00 takes precedence) [4]	30/50	• • • Covering, e.g. by winding, the separate bead-rings or bead-cores with textile material, e.g. with flipper strips (folding textile layers around bead-rings or bead-cores B29D 30/18, B29D 30/32; jointly covering bead-rings or bead-cores B29D 30/34) [4]
23/14	• Cigar or cigarette holders [4]		
23/18	• Pleated hoses [4]		
23/20	• Flexible squeeze tubes, e.g. for cosmetics [4]		
23/24	• Endless tubes, e.g. inner tubes for pneumatic tyres [6]		
<b>24/00</b>	<b>Producing articles with hollow walls</b> [4]		
<b>25/00</b>	<b>Producing frameless domes</b>		
<b>28/00</b>	<b>Producing nets or the like</b> (by knotting D04G) [4]		
<b>29/00</b>	<b>Producing belts or bands</b> [4]		

## B29D

- 30/52 • • Unvulcanised treads, e.g. on used tyres; Retreading (apparatus for forming and vulcanising treads B29C 35/02; apparatus characterised by the means for holding wheels or parts thereof B60B 30/00) [4, 5]
- 30/54 • • • Retreading [4]
- 30/56 • • • • Retreading with prevulcanised tread [4]
- 30/58 • • • Applying bands of rubber treads, i.e. applying camel backs [4]
- 30/60 • • • • by winding narrow strips [4]
- 30/62 • • • • by extrusion or injection of the tread on carcass [4]
- 30/64 • • • Tyre spreaders [4]
- 30/66 • • • Moulding treads on to tyre casings, e.g. non-skid treads with spikes [4]
- 30/68 • • • Cutting profiles into the treads of tyres [4]
- 30/70 • • Annular breakers [4]
- 30/72 • • Side-walls [4]

**33/00 Producing bushes for bearings [2010.01]**

**35/00 Producing footwear [2010.01]**

### Note(s) [2010.01]

1. Classification is made in this group if the moulding technique is of interest.
  2. The assembling of individual parts by mechanical joining is classified in subclass A43D, e.g. by gluing shoe parts A43D 25/00.
- 35/02 • made in one piece using a moulding technique, e.g. by injection moulding or casting [2010.01]
  - 35/04 • • having multilayered parts [2010.01]
  - 35/06 • having soles or heels formed and joined on to preformed uppers using a moulding technique, e.g. by injection moulding, pressing and vulcanising [2010.01]
  - 35/08 • • having multilayered parts [2010.01]
  - 35/10 • having preformed soles or heels joined on to preformed uppers using a moulding technique, e.g. by feeding or injecting plastics material between the parts to be joined [2010.01]
  - 35/12 • Producing parts thereof, e.g. soles, heels or uppers, by a moulding technique [2010.01]
  - 35/14 • • Multilayered parts [2010.01]
- 99/00 Subject matter not provided for in other groups of this subclass [2010.01]**

## **B29K INDEXING SCHEME ASSOCIATED WITH SUBCLASSES B29B, B29C OR B29D, RELATING TO MOULDING MATERIALS OR TO MATERIALS FOR REINFORCEMENTS, FILLERS OR PREFORMED PARTS, e.g. INSERTS [4]**

### Note(s)

1. This subclass constitutes an indexing scheme associated with subclasses B29B, B29C or B29D.
2. In this subclass, the following term is used with the meaning indicated:
  - "rubber" covers:
    - a. natural or conjugated diene rubbers;
    - b. rubber in general (for a specific rubber, other than a natural rubber or a conjugated diene rubber, see the group provided for such macromolecular compounds).

### Subclass index

COMPOSITIONS FOR MOULDING MATERIALS; CONDITION, FORM OR STATE OF MOULDED MATERIAL.....	1/00-105/00
COMPOSITIONS FOR REINFORCEMENTS.....	201/00-311/00
COMPOSITIONS FOR FILLERS.....	401/00-511/00
COMPOSITIONS FOR PREFORMED PARTS.....	601/00-711/00

### Compositions for moulding materials; Condition, form or state of moulded material [6]

- 1/00 Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, as moulding material [4]**
- 7/00 Use of natural rubber as moulding material [4]**
- 9/00 Use of rubber derived from conjugated dienes, as moulding material [4]**
- 9/06 • SB polymers, i.e. butadiene-styrene polymers [4]
- 19/00 Use of rubber not provided for in a single one of main groups B29K 7/00-B29K 9/00, as moulding material [4]**
- 21/00 Use of unspecified rubbers as moulding material [4]**
- 23/00 Use of polyalkenes as moulding material [4]**

- 25/00 Use of polymers of vinyl-aromatic compounds as moulding material [4]**
- 27/00 Use of polyvinylhalogenides as moulding material [4]**
- 27/06 • PVC, i.e. polyvinylchloride [4]
- 27/12 • containing fluorine [4]
- 27/18 • • PTFE, i.e. polytetrafluorethene [4]
- 29/00 Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals as moulding material [4]**
- 31/00 Use of polyvinylesters as moulding material [4]**
- 33/00 Use of polymers of unsaturated acids or derivatives thereof, as moulding material (B29K 35/00 takes precedence) [4]**
- 33/04 • Polymers of esters [4]
- 33/18 • Polymers of nitriles [4]

33/20	• • PAN, i.e. polyacrylonitrile [4]	96/04	• Block polymers (B29K 55/02 takes precedence) [4]
35/00	Use of polymers of unsaturated polycarboxylic acids as moulding material [4]	101/00	Use of unspecified macromolecular compounds as moulding material (use of unspecified rubbers B29K 21/00) [4]
45/00	Use of polymers of unsaturated cyclic compounds having no unsaturated aliphatic groups in a side-chain, e.g. coumarone-indene resins, as moulding material [4]	101/10	• Thermosetting resins [4]
55/00	Use of specific polymers obtained by polymerisation reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of main groups B29K 23/00-B29K 45/00, as moulding material [4]	101/12	• Thermoplastic materials [6]
55/02	• ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers [4]	103/00	Use of resin-bonded materials as moulding material [4]
59/00	Use of polyacetals as moulding material [4]	103/04	• Inorganic materials [4]
61/00	Use of condensation polymers of aldehydes or ketones, as moulding material [4]	103/06	• • Metal powders, metal carbides or the like [4]
61/04	• Phenoplasts [4]	103/08	• • Mineral aggregates, e.g. sand, clay or the like [4]
61/20	• Aminoplasts [4]	105/00	Condition, form or state of moulded material [4]
63/00	Use of epoxy resins as moulding material [4]	105/02	• heat-shrinkable [4]
67/00	Use of polyesters as moulding material [4]	105/04	• cellular or porous [4]
69/00	Use of polycarbonates as moulding material [4]	105/06	• containing reinforcements, fillers or inserts [4]
71/00	Use of polyethers as moulding material [4]	105/08	• • of continuous length, e.g. cords, rovings, mats, fabrics, strands, yarns [4]
73/00	Use of other polymers having oxygen as the only hetero atom in the main chain, as moulding material [4]	105/10	• • • oriented [4]
75/00	Use of polyureas or polyurethanes as moulding material [4]	105/12	• • of short lengths, e.g. chopped filaments, staple fibres, bristles [4]
77/00	Use of polyamides, e.g. polyesteramides, as moulding material [4]	105/14	• • • oriented [4]
79/00	Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, as moulding material [4]	105/16	• • Fillers [4]
81/00	Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, as moulding material [4]	105/18	• • • oriented [4]
83/00	Use of polymers having silicon, with or without sulfur, nitrogen, oxygen or carbon only, in the main chain, as moulding material [4]	105/20	• • Inserts [4]
85/00	Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, as moulding material [4]	105/22	• • • metallic [4]
86/00	Use of specific polymers obtained by polycondensation or polyaddition, not provided for in a single one of main groups B29K 59/00-B29K 85/00, as moulding material [4]	105/24	• cross-linked or vulcanised [4]
91/00	Use of waxes as moulding material [4]	105/26	• Scrap [4]
95/00	Use of bituminous materials as moulding material [4]	105/28	• opaque [4]
96/00	Use of specified macromolecular materials not provided for in a single one of main groups B29K 1/00-B29K 95/00, as moulding material [4]	105/30	• reflecting [4]
96/02	• Graft polymers (B29K 55/02 takes precedence) [4]	105/32	• transparent [4]
		105/34	• insulating [4]
		<b>Compositions for reinforcements [6]</b>	
		201/00	Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, as reinforcement [6]
		207/00	Use of natural rubber as reinforcement [6]
		209/00	Use of rubber derived from conjugated dienes, as reinforcement [6]
		209/06	• SB polymers, i.e. butadiene-styrene polymers [6]
		219/00	Use of rubber not provided for in a single one of main groups B29K 207/00-B29K 209/00, as reinforcement [6]
		221/00	Use of unspecified rubbers as reinforcement [6]
		223/00	Use of polyalkenes as reinforcement [6]
		225/00	Use of polymers of vinyl-aromatic compounds as reinforcement [6]
		227/00	Use of polyvinylhalogenides as reinforcement [6]
		227/06	• PVC, i.e. polyvinylchloride [6]
		227/12	• containing fluorine [6]
		227/18	• • PTFE, i.e. polytetrafluoroethene [6]
		229/00	Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals as reinforcement [6]
		231/00	Use of polyvinylesters as reinforcement [6]

## B29K

233/00	<b>Use of polymers of unsaturated acids or derivatives thereof, as reinforcement</b> (B29K 235/00 takes precedence) [6]	296/00	<b>Use of specific macromolecular materials not provided for in a single one of main groups B29K 201/00-B29K 295/00, as reinforcement</b> [6]
233/04	• Polymers of esters [6]	296/02	• Graft polymers (B29K 255/02 takes precedence) [6]
233/18	• Polymers of nitriles [6]	296/04	• Block polymers (B29K 255/02 takes precedence) [6]
233/20	• • PAN, i.e. polyacrylonitrile [6]		
235/00	<b>Use of polymers of unsaturated polycarboxylic acids as reinforcement</b> [6]	301/00	<b>Use of unspecified macromolecular compounds as reinforcement</b> (use of unspecified rubbers B29K 221/00) [6]
245/00	<b>Use of polymers of unsaturated cyclic compounds having no unsaturated aliphatic groups in a side-chain, e.g. coumarone-indene resins, as reinforcement</b> [6]	301/10	• Thermosetting resins [6]
255/00	<b>Use of specific polymers obtained by polymerisation reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of main groups B29K 223/00-B29K 245/00, as reinforcement</b> [6]	301/12	• Thermoplastic materials [6]
255/02	• ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers [6]	303/00	<b>Use of resin-bonded materials as reinforcement</b> [6]
259/00	<b>Use of polyacetals as reinforcement</b> [6]	303/04	• Inorganic materials [6]
261/00	<b>Use of condensation polymers of aldehydes or ketones, as reinforcement</b> [6]	303/06	• • Metal powders, metal carbides or the like [6]
261/04	• Phenoplasts [6]	303/08	• • Mineral aggregates, e.g. sand, clay or the like [6]
261/20	• Aminoplasts [6]	305/00	<b>Use of metals, their alloys or their compounds, as reinforcement</b> [6]
263/00	<b>Use of epoxy resins as reinforcement</b> [6]		<b>Note(s)</b>
267/00	<b>Use of polyesters as reinforcement</b> [6]		Alloys or compounds of specified metals are indexed with the same code as the specified metals.
269/00	<b>Use of polycarbonates as reinforcement</b> [6]	305/02	• Aluminium [6]
271/00	<b>Use of polyethers as reinforcement</b> [6]	305/04	• Lead [6]
273/00	<b>Use of other polymers having oxygen as the only hetero atom in the main chain, as reinforcement</b> [6]	305/06	• Tin [6]
275/00	<b>Use of polyureas or polyurethanes as reinforcement</b> [6]	305/08	• Transition metals [6]
277/00	<b>Use of polyamides, e.g. polyesteramides, as reinforcement</b> [6]	305/10	• • Copper [6]
279/00	<b>Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, as reinforcement</b> [6]	305/12	• • Iron [6]
281/00	<b>Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, as reinforcement</b> [6]	307/00	<b>Use of elements other than metals as reinforcement</b> [6]
283/00	<b>Use of polymers having silicon, with or without sulfur, nitrogen, oxygen or carbon only, in the main chain, as reinforcement</b> [6]	307/02	• Boron [6]
285/00	<b>Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, as reinforcement</b> [6]	307/04	• Carbon [6]
286/00	<b>Use of specific polymers obtained by polycondensation or polyaddition, not provided for in a single one of main groups B29K 259/00-B29K 285/00, as reinforcement</b> [6]	309/00	<b>Use of inorganic materials not provided for in groups B29K 303/00-B29K 307/00, as reinforcement</b> [6]
295/00	<b>Use of bituminous materials as reinforcement</b> [6]	309/02	• Ceramics [6]
		309/04	• • Carbides; Nitrides [6]
		309/06	• Concrete [6]
		309/08	• Glass [6]
		309/10	• Mica [6]
		309/12	• Asbestos [6]
		311/00	<b>Use of natural products or their composites, not provided for in groups B29K 201/00-B29K 309/00, as reinforcement</b> [6]
		311/02	• Cork [6]
		311/04	• Linoleum [6]
		311/06	• Bone, horn, ivory [6]
		311/08	• Leather [6]
		311/10	• Natural fibres, e.g. wool, cotton [6]
		311/12	• Paper, e.g. cardboard [6]
		311/14	• Wood, e.g. woodboard, fibreboard [6]
			<b>Compositions for fillers</b> [6]
		401/00	<b>Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, as filler</b> [6]
		407/00	<b>Use of natural rubber as filler</b> [6]
		409/00	<b>Use of rubber derived from conjugated dienes, as filler</b> [6]
		409/06	• SB polymers, i.e. butadiene-styrene polymers [6]

419/00	Use of rubber not provided for in a single one of main groups B29K 407/00-B29K 409/00, as filler [6]	483/00	Use of polymers having silicon, with or without sulfur, nitrogen, oxygen or carbon only, in the main chain, as filler [6]
421/00	Use of unspecified rubbers as filler [6]	485/00	Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, as filler [6]
423/00	Use of polyalkenes as filler [6]	486/00	Use of specific polymers obtained by polycondensation or polyaddition, not provided for in a single one of main groups B29K 459/00-B29K 485/00, as filler [6]
425/00	Use of polymers of vinyl-aromatic compounds as filler [6]	491/00	Use of waxes as filler [6]
427/00	Use of polyvinylhalogenides as filler [6]	495/00	Use of bituminous materials as filler [6]
427/06	• PVC, i.e. polyvinylchloride [6]	496/00	Use of specific macromolecular materials not provided for in a single one of main groups B29K 401/00-B29K 495/00, as filler [6]
427/12	• containing fluorine [6]	496/02	• Graft polymers (B29K 455/02 takes precedence) [6]
427/18	• • PTFE, i.e. polytetrafluoroethene [6]	496/04	• Block polymers (B29K 455/02 takes precedence) [6]
429/00	Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals as filler [6]	501/00	Use of unspecified macromolecular compounds as filler (use of unspecified rubbers B29K 421/00) [6]
431/00	Use of polyvinylesters as filler [6]	501/10	• Thermosetting resins [6]
433/00	Use of polymers of unsaturated acids or derivatives thereof, as filler (B29K 435/00 takes precedence) [6]	501/12	• Thermoplastic materials [6]
433/04	• Polymers of esters [6]	503/00	Use of resin-bonded materials as filler [6]
433/18	• Polymers of nitriles [6]	503/04	• Inorganic materials [6]
433/20	• • PAN, i.e. polyacrylonitrile [6]	503/06	• • Metal powders, metal carbides or the like [6]
435/00	Use of polymers of unsaturated polycarboxylic acids as filler [6]	503/08	• • Mineral aggregates, e.g. sand, clay or the like [6]
445/00	Use of polymers of unsaturated cyclic compounds having no unsaturated aliphatic groups in a side-chain, e.g. coumarone-indene resins, as filler [6]	505/00	Use of metals, their alloys or their compounds, as filler [6]
455/00	Use of specific polymers obtained by polymerisation reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of main groups B29K 423/00-B29K 445/00, as filler [6]		<b>Note(s)</b>
455/02	• ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers [6]		Alloys or compounds of specified metals are indexed with the same code as the specified metals.
459/00	Use of polyacetals as filler [6]	505/02	• Aluminium [6]
461/00	Use of condensation polymers of aldehydes or ketones, as filler [6]	505/04	• Lead [6]
461/04	• Phenoplasts [6]	505/06	• Tin [6]
461/20	• Aminoplasts [6]	505/08	• Transition metals [6]
463/00	Use of epoxy resins as filler [6]	505/10	• • Copper [6]
467/00	Use of polyesters as filler [6]	505/12	• • Iron [6]
469/00	Use of polycarbonates as filler [6]	505/14	• • Noble metals, e.g. silver, gold, platinum [6]
471/00	Use of polyethers as filler [6]	507/00	Use of elements other than metals as filler [6]
473/00	Use of other polymers having oxygen as the only hetero atom in the main chain, as filler [6]	507/02	• Boron [6]
475/00	Use of polyureas or polyurethanes as filler [6]	507/04	• Carbon [6]
477/00	Use of polyamides, e.g. polyesteramides, as filler [6]	509/00	Use of inorganic materials not provided for in groups B29K 503/00-B29K 507/00, as filler [6]
479/00	Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, as filler [6]	509/02	• Ceramics [6]
481/00	Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, as filler [6]	509/04	• • Carbides; Nitrides [6]
		509/06	• Concrete [6]
		509/08	• Glass [6]
		509/10	• Mica [6]
		509/12	• Asbestos [6]
		511/00	Use of natural products or their composites, not provided for in groups B29K 401/00-B29K 509/00, as filler [6]
		511/02	• Cork [6]
		511/04	• Linoleum [6]
		511/06	• Bone, horn, ivory [6]
		511/08	• Leather [6]
		511/10	• Natural fibres, e.g. wool, cotton [6]

## B29K

- 511/12 • Paper, e.g. cardboard [6]
- 511/14 • Wood, e.g. woodboard, fibreboard [6]

### Compositions for preformed parts, e.g. inserts [6]

- |   |  |
|---|--|
| <p><b>601/00</b> Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, for preformed parts, e.g. for inserts [6]</p> <p><b>607/00</b> Use of natural rubber for preformed parts, e.g. for inserts [6]</p> <p><b>609/00</b> Use of rubber derived from conjugated dienes, for preformed parts, e.g. for inserts [6]</p> <p>609/06 • SB polymers, i.e. butadiene-styrene polymers [6]</p> <p><b>619/00</b> Use of rubber not provided for in a single one of main groups B29K 607/00-B29K 609/00, for preformed parts, e.g. for inserts [6]</p> <p><b>621/00</b> Use of unspecified rubbers for preformed parts, e.g. for inserts [6]</p> <p><b>623/00</b> Use of polyalkenes for preformed parts, e.g. for inserts [6]</p> <p><b>625/00</b> Use of polymers of vinyl-aromatic compounds for preformed parts, e.g. for inserts [6]</p> <p><b>627/00</b> Use of polyvinylhalogenides for preformed parts, e.g. for inserts [6]</p> <p>627/06 • PVC, i.e. polyvinylchloride [6]</p> <p>627/12 • containing fluorine [6]</p> <p>627/18 • • PTFE, i.e. polytetrafluoroethene [6]</p> <p><b>629/00</b> Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals for preformed parts, e.g. for inserts [6]</p> <p><b>631/00</b> Use of polyvinylesters for preformed parts, e.g. for inserts [6]</p> <p><b>633/00</b> Use of polymers of unsaturated acids or derivatives thereof, for preformed parts, e.g. for inserts (B29K 635/00 takes precedence) [6]</p> <p>633/04 • Polymers of esters [6]</p> <p>633/18 • Polymers of nitriles [6]</p> <p>633/20 • • PAN, i.e. polyacrylonitrile [6]</p> <p><b>635/00</b> Use of polymers of unsaturated polycarboxylic acids for preformed parts, e.g. for inserts [6]</p> <p><b>645/00</b> Use of polymers of unsaturated cyclic compounds having no unsaturated aliphatic groups in a side-chain, e.g. coumarone-indene resins, for preformed parts, e.g. for inserts [6]</p> <p><b>655/00</b> Use of specific polymers obtained by polymerisation reactions only involving carbon-to-carbon unsaturated bonds, not provided for in a single one of main groups B29K 623/00-B29K 645/00, for preformed parts, e.g. for inserts [6]</p> <p>655/02 • ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers [6]</p> <p><b>659/00</b> Use of polyacetals for preformed parts, e.g. for inserts [6]</p> | <p><b>661/00</b> Use of condensation polymers of aldehydes or ketones, for preformed parts, e.g. for inserts [6]</p> <p>661/04 • Phenoplasts [6]</p> <p>661/20 • Aminoplasts [6]</p> <p><b>663/00</b> Use of epoxy resins for preformed parts, e.g. for inserts [6]</p> <p><b>667/00</b> Use of polyesters for preformed parts, e.g. for inserts [6]</p> <p><b>669/00</b> Use of polycarbonates for preformed parts, e.g. for inserts [6]</p> <p><b>671/00</b> Use of polyethers for preformed parts, e.g. for inserts [6]</p> <p><b>673/00</b> Use of other polymers having oxygen as the only hetero atom in the main chain, for preformed parts, e.g. for inserts [6]</p> <p><b>675/00</b> Use of polyureas or polyurethanes for preformed parts, e.g. for inserts [6]</p> <p><b>677/00</b> Use of polyamides, e.g. polyesteramides, for preformed parts, e.g. for inserts [6]</p> <p><b>679/00</b> Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, for preformed parts, e.g. for inserts [6]</p> <p><b>681/00</b> Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, for preformed parts, e.g. for inserts [6]</p> <p><b>683/00</b> Use of polymers having silicon, with or without sulfur, nitrogen, oxygen or carbon only, in the main chain, for preformed parts, e.g. for inserts [6]</p> <p><b>685/00</b> Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, for preformed parts, e.g. for inserts [6]</p> <p><b>686/00</b> Use of specific polymers obtained by polycondensation or polyaddition, not provided for in a single one of main groups B29K 659/00-B29K 685/00, for preformed parts, e.g. for inserts [6]</p> <p><b>691/00</b> Use of waxes for preformed parts, e.g. for inserts [6]</p> <p><b>695/00</b> Use of bituminous materials for preformed parts, e.g. for inserts [6]</p> <p><b>696/00</b> Use of specific macromolecular materials not provided for in a single one of main groups B29K 601/00-B29K 695/00, for preformed parts, e.g. for inserts [6]</p> <p>696/02 • Graft polymers (B29K 655/02 takes precedence) [6]</p> <p>696/04 • Block polymers (B29K 655/02 takes precedence) [6]</p> <p><b>701/00</b> Use of unspecified macromolecular compounds for preformed parts, e.g. for inserts (use of unspecified rubbers B29K 621/00) [6]</p> <p>701/10 • Thermosetting resins [6]</p> <p>701/12 • Thermoplastic materials [6]</p> <p><b>703/00</b> Use of resin-bonded materials for preformed parts, e.g. for inserts [6]</p> <p>703/04 • Inorganic materials [6]</p> <p>703/06 • • Metal powders, metal carbides or the like [6]</p> <p>703/08 • • Mineral aggregates, e.g. sand, clay or the like [6]</p> |
|---|--|



**705/00 Use of metals, their alloys or their compounds, for preformed parts, e.g. for inserts [6]**

**Note(s)**

Alloys or compounds of specified metals are indexed with the same code as the specified metals.

- 705/02 • Aluminium [6]
- 705/04 • Lead [6]
- 705/06 • Tin [6]
- 705/08 • Transition metals [6]
- 705/10 • • Copper [6]
- 705/12 • • Iron [6]
- 705/14 • • Noble metals, e.g. silver, gold, platinum [6]

**707/00 Use of elements other than metals for preformed parts, e.g. for inserts [6]**

- 707/02 • Boron [6]
- 707/04 • Carbon [6]

**709/00 Use of inorganic materials not provided for in groups B29K 703/00-B29K 707/00, for preformed parts, e.g. for inserts [6]**

- 709/02 • Ceramics [6]
- 709/04 • • Carbides; Nitrides [6]
- 709/06 • Concrete [6]
- 709/08 • Glass [6]
- 709/10 • Mica [6]
- 709/12 • Asbestos [6]

**711/00 Use of natural products or their composites, not provided for in groups B29K 601/00-B29K 709/00, for preformed parts, e.g. for inserts [6]**

- 711/02 • Cork [6]
- 711/04 • Linoleum [6]
- 711/06 • Bone, horn, ivory [6]
- 711/08 • Leather [6]
- 711/10 • Natural fibres, e.g. wool, cotton [6]
- 711/12 • Paper, e.g. cardboard [6]
- 711/14 • Wood, e.g. woodboard, fibreboard [6]

**B29L INDEXING SCHEME ASSOCIATED WITH SUBCLASS B29C, RELATING TO PARTICULAR ARTICLES [4]**

**Note(s)**

This subclass constitutes an indexing scheme associated with subclass B29C.

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|---|---|
| <p><b>1/00 Articles provided with screw threads [4]</b></p> <p><b>5/00 Elements of slide fasteners [4]</b></p> <p><b>7/00 Flat articles, e.g. films or sheets (B29L 24/00 takes precedence) [4]</b></p> <p><b>9/00 Layered products [4]</b></p> <p><b>11/00 Optical elements, e.g. lenses, prisms [4]</b></p> <p><b>12/00 Frames [4]</b></p> <p><b>15/00 Gear wheels or similar articles with grooves or projections, e.g. control knobs [4]</b></p> <p><b>16/00 Articles with corrugations (B29L 23/18 takes precedence) [4]</b></p> <p><b>17/00 Carriers of records containing fine grooves or impressions, e.g. disc records for needle playback, cylinder records [4]</b></p> <p><b>19/00 Buttons or semi-finished parts of buttons [4]</b></p> <p><b>21/00 Hair combs or similar toothed or slotted articles [4]</b></p> <p><b>22/00 Hollow articles (tubular articles B29L 23/00; pneumatic tyres B29L 30/00) [4]</b></p> <p>22/02 • Inflatable articles (balls B29L 31/54) [5]</p> <p><b>23/00 Tubular articles (B29L 24/00 takes precedence) [4]</b></p> <p>23/14 • Cigar or cigarette holders [4]</p> <p>23/18 • Pleated hoses [4]</p> <p>23/20 • Flexible squeeze tubes, e.g. for cosmetics [4]</p> <p>23/24 • Endless tubes, e.g. inner tubes for pneumatic tyres [6]</p> <p><b>24/00 Articles with hollow walls [4]</b></p> <p><b>25/00 Frameless domes [4]</b></p> | <p><b>28/00 Nets or the like [4]</b></p> <p><b>29/00 Belts or bands [4]</b></p> <p><b>30/00 Pneumatic or solid tyres or parts thereof (inner tubes B29L 23/24) [4]</b></p> <p><b>31/00 Other particular articles [4]</b></p> <p>31/04 • Bearings [4]</p> <p>31/06 • Rods, e.g. connecting rods [4]</p> <p>31/08 • Blades for rotors, stators, fans, turbines or the like, e.g. screw propellers [4]</p> <p>31/10 • Building elements, e.g. bricks, blocks, tiles, panels, posts, beams [4]</p> <p>31/12 • Chains [4]</p> <p>31/14 • Filters, sieves or screens [4]</p> <p>31/16 • Frictional elements, e.g. brake or clutch linings [4]</p> <p>31/18 • Heat-exchangers or parts thereof [4]</p> <p>31/20 • Fuel-blocks, e.g. nuclear fuel elements [4]</p> <p>31/22 • Hinges [4]</p> <p>31/24 • Pipe joints or couplings (B29L 31/26 takes precedence) [4]</p> <p>31/26 • Sealing devices, e.g. packaging for pistons or pipe joints [4]</p> <p>31/28 • Tools, e.g. cutlery [4]</p> <p>31/30 • Vehicles, e.g. ships or aircraft, or body parts thereof [4]</p> <p>31/32 • Wheels, pinions, pulleys, castors or rollers [4]</p> <p>31/34 • Electrical apparatus, e.g. sparking plugs or parts thereof [4]</p> <p>31/36 • • Plugs, connectors, or parts thereof [4]</p> <p>31/38 • Loudspeaker cones; Acoustic diaphragms [4]</p> <p>31/40 • Test specimens [4]</p> <p>31/42 • Brushes [4]</p> <p>31/44 • Furniture or parts thereof [4]</p> <p>31/46 • Knobs or handles [4]</p> <p>31/48 • Wearing apparel [4]</p> |
|---|---|

## B29L

- |       |  |       |   |
|-------|--|-------|---|
| 31/50 | • • Footwear, e.g. shoes or parts thereof [4]              | 31/56 | • Stoppers or lids for bottles, jars, or the like [4]                     |
| 31/52 | • Sports equipment; Toys (B29L 31/54 takes precedence) [4] | 31/58 | • Upholstery or cushions, e.g. vehicle upholstery or interior padding [4] |
| 31/54 | • Balls [4]  | 31/60 | • Multitubular or multicompartmented articles, e.g. honeycomb [4]         |

## B30 PRESSES

**B30B PRESSES IN GENERAL; PRESSES NOT OTHERWISE PROVIDED FOR** (producing ultra-high pressure or ultra-high pressure and high temperature to effect modifications of a substance, e.g. for making artificial diamonds B01J 3/00) [2]

### Subclass index

PRESSES CHARACTERISED BY OPERATION OF PRESSING MECHANISMS.....	1/00, 3/00, 5/00, 7/00
PRESSES FOR SPECIAL PURPOSES.....	9/00, 11/00
OTHER PRESSES.....	12/00
DETAILS, ACCESSORIES, CONTROL.....	15/00
OTHER PRESSING METHODS.....	13/00

#### **1/00 Presses, using a press ram, characterised by the features of the drive therefor, pressure being transmitted directly, or through simple thrust or tension members only, to the press ram or platen**

- 1/02 • by lever mechanism (by toggle mechanism B30B 1/10)
- 1/04 • • operated by hand or foot
- 1/06 • • operated by cams, eccentrics, or cranks
- 1/08 • • operated by fluid-pressure means
- 1/10 • by toggle mechanism
- 1/12 • • operated by hand or foot
- 1/14 • • operated by cams, eccentrics, or cranks
- 1/16 • • operated by fluid-pressure means
- 1/18 • by screw means
- 1/20 • • driven by hand
- 1/22 • • driven through friction disc means
- 1/23 • • operated by fluid-pressure means [2]
- 1/24 • by rack-and-pinion means
- 1/26 • by cams, eccentrics, or cranks
- 1/28 • • the cam, crank, or eccentric being disposed below the lower platen or table and operating to pull down the upper platen or slide
- 1/30 • by the pull of chains or ropes
- 1/32 • by plungers under fluid pressure
- 1/34 • • involving a plurality of plungers acting on the platen (gas operated B30B 1/38)
- 1/36 • • having telescoping plungers (gas operated B30B 1/38)
- 1/38 • • wherein the plungers are operated by pressure of a gas, e.g. steam, air
- 1/40 • by wedge means
- 1/42 • by magnetic means, e.g. electromagnetic [2]

#### **3/00 Presses characterised by the use of rotary pressing members, e.g. rollers, rings, discs**

- 3/02 • co-operating with a fixed member
- 3/04 • co-operating with one another, e.g. with co-operating cones
- 3/06 • • arranged one within another, e.g. with a roller disposed within a rotating ring and co-operating with the inner surface thereof

#### **5/00 Presses characterised by the use of pressing means other than those mentioned in groups B30B 1/00 and B30B 3/00**

- 5/02 • wherein the pressing means is in the form of a flexible element, e.g. diaphragm, urged by fluid pressure [2]
- 5/04 • wherein the pressing means is in the form of an endless band
- 5/06 • • co-operating with another endless band

#### **7/00 Presses characterised by a particular arrangement of the pressing members**

- 7/02 • having several platens arranged one above the other
- 7/04 • wherein pressing is effected in different directions simultaneously or in turn

#### **9/00 Presses specially adapted for particular purposes**

- 9/02 • for squeezing-out liquid from liquid-containing material, e.g. juice from fruits, oil from oil-containing material (kitchen equipment A47J; filtering, e.g. straining solids from liquids, using presses in combination with filtering elements B01D; expelling water from textile fabrics or laundry D06C, D06F; drying F26)
- 9/04 • • using press rams
- 9/06 • • • co-operating with permeable casings or strainers
- 9/08 • • • co-operating with a rotary casing
- 9/10 • • • without use of a casing
- 9/12 • • using pressing worms or screws co-operating with a permeable casing
- 9/14 • • • operating with only one screw or worm
- 9/16 • • • operating with two or more screws or worms
- 9/18 • • • with means for adjusting the outlet for the solid
- 9/20 • • using rotary pressing members, other than worms or screws, e.g. rollers, rings, discs
- 9/22 • • using a flexible element, e.g. diaphragm, urged by fluid pressure (connection of valves to inflatable elastic bodies B60C 29/00) [3]
- 9/24 • • using an endless pressing band
- 9/26 • • Permeable casings or strainers

- |   |  |
|---|--|
| <p>9/28 • for forming shaped articles (from material in powder, granular, or paste form, e.g. briquetting presses, B30B 11/00)</p> <p>9/30 • for baling; Compression boxes therefor (baling hay, straw, or the like A01F)</p> <p>9/32 • for consolidating scrap metal or for compacting used cars</p> <p><b>11/00 Presses specially adapted for forming shaped articles from material in particulate or plastic state, e.g. briquetting presses, tableting presses</b> (apparatus for forming or shaping of dough A21C 3/00, A21C 11/00; apparatus for shaping clay or mixtures containing cement B28B; apparatus for shaping of plastic or substances in a plastic state B29, e.g. for compression moulding B29C 43/00, for extrusion moulding B29C 47/00)</p> <p>11/02 • using a ram exerting pressure on the material in a moulding space</p> <p>11/04 • • co-operating with a fixed mould</p> <p>11/06 • • • each charge of the material being compressed against the previously formed body</p> <p>11/08 • • co-operating with moulds carried by a turn-table</p> <p>11/10 • • • intermittently rotated</p> <p>11/12 • • co-operating with moulds on the circumference of a rotating drum</p> <p>11/14 • • co-operating with moulds on a movable carrier other than a turn-table or a rotating drum</p> <p>11/16 • using pocketed rollers, e.g. two co-operating pocketed rollers</p> <p>11/18 • using profiled rollers</p> <p>11/20 • Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring</p> <p>11/22 • Extrusion presses; Dies therefor (extruding by the use of roller-and-ring machines B30B 11/20)</p> <p>11/24 • • using screws or worms</p> <p>11/26 • • using press rams</p> <p>11/28 • • using perforated rollers or discs</p> | <p>11/30 • • using directly-acting fluid pressure</p> <p>11/34 • for coating articles, e.g. tablets</p> <p><b>12/00 Presses not provided for in groups B30B 1/00-B30B 11/00 [2]</b></p> <p><b>13/00 Methods of pressing not special to the use of presses of any one of the preceding main groups B30B 1/00-B30B 12/00 [2]</b></p> <p><b>15/00 Details of, or accessories for, presses; Auxiliary measures in connection with pressing</b> (safety devices F16P)</p> <p>15/02 • Dies; Inserts therefor; Mountings thereof; Moulds (extrusion dies B30B 11/22)</p> <p>15/04 • Frames; Guides</p> <p>15/06 • Platens or press rams</p> <p>15/08 • Accessory tools, e.g. knives; Mountings therefor</p> <p>15/10 • Brakes specially adapted for presses</p> <p>15/12 • Clutches specially adapted for presses</p> <p>15/14 • Control arrangements for mechanically-driven presses</p> <p>15/16 • Control arrangements for fluid-driven presses (pumps <u>per se</u> F04; hydraulic accumulators <u>per se</u> F15B; valves <u>per se</u> F16K)</p> <p>15/18 • • controlling the reciprocating motion of the ram</p> <p>15/20 • • • controlling the speed of the ram, e.g. the speed of the approach, pressing or return strokes</p> <p>15/22 • • controlling the degree of pressure applied by the ram during the pressing stroke</p> <p>15/24 • • controlling the movement of a plurality of actuating members to maintain parallel movement of the platen or press beam</p> <p>15/26 • Programme control arrangements</p> <p>15/28 • Arrangements for preventing distortion of, or damage to, presses or parts thereof</p> <p>15/30 • Feeding material to presses</p> <p>15/32 • Discharging presses</p> <p>15/34 • Heating or cooling presses or parts thereof</p> |
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## B31 MAKING PAPER ARTICLES; WORKING PAPER

### Note(s)

1. This class covers subject matter restricted to adaptations or associations of handling sheets, webs, or blanks peculiar to paper-working, e.g. bag or box making, machinery.
2. This class does not cover:
  - making articles directly from paper pulp, which is covered by D21J;
  - handling sheets, webs, or blanks of wider applicability, irrespective of whether described or claimed only for paper-working machinery, which is regarded as being of a more comprehensive nature and is covered by B65H.
3. In this class, the following term is used with the meaning indicated:
  - "paper" covers material worked in a manner analogous to paper, e.g. plastics sheet materials, laminated materials or metal foils.

**B31B MAKING BOXES, CARTONS, ENVELOPES, OR BAGS** (incising, scoring, in general B26D 3/08; combined making and filling B65B)

### Note(s)

1. In this subclass, envelopes or bags are regarded as being essentially flexible containers, the final shape of which is determined by their contents.
2. In this subclass, the following expression is used with the meaning indicated:
  - "boxes or cartons" includes bags formed similarly to cartons, trays with upstanding side-walls, barrels, tubes and cups, other than articles formed by winding.

**Subclass index**

MAKING IN GENERAL.....	1/00, 47/00, 49/00
MAKING BOXES OR CARTONS	
Characterised by the method of making	
by folding a single piece.....	3/00, 5/00
by assembling pieces.....	13/00, 17/00
by other shaping under pressure.....	43/00
Characterised by the kind of articles	
lined or reinforced articles.....	7/00, 9/00, 15/00
other specified articles.....	11/00, 13/00, 45/00
MAKING ENVELOPES OR BAGS	
Characterised by the method of making	
from sheets.....	21/00, 31/00-35/00
from webs.....	23/00, 37/00
by other shaping under pressure.....	43/00
Characterised by the kind of articles	
flat rectangular articles.....	19/00-23/00
articles with bases provided for thickness.....	29/00-37/00
other specified articles.....	25/00, 27/00, 39/00, 41/00, 45/00

**1/00 Box, carton, envelope or bag making machinery characterised by performing specific operations**

(machinery for performing operations of general application, see the appropriate subclasses)

- 1/02 • Feeding or positioning sheets, blanks, or webs
- 1/04 • • Feeding sheets or blanks
- 1/06 • • • from stacks
- 1/08 • • • during envelope- or bag-making operations
- 1/10 • • Feeding or positioning webs
- 1/12 • • by air pressure or suction
- 1/14 • Cutting, e.g. perforating, punching, slitting, trimming
- 1/16 • • Cutting webs to form sheets or blanks
- 1/18 • • Slitting webs longitudinally
- 1/20 • • Cutting sheets or blanks
- 1/22 • • • Notching; Trimming edges of flaps
- 1/24 • • • Making window openings
- 1/25 • Surface scoring (cutting through material B31B 1/14) [2]
- 1/26 • Folding sheets, blanks, or webs
- 1/28 • • around mandrels, including bottom-forming operations
- 1/30 • • • the mandrels moving
- 1/32 • • • • in circular paths
- 1/34 • • • • about their own axes
- 1/36 • • by continuously feeding same to stationary members, e.g. plates, ploughs, cores
- 1/38 • • • the members being forming-tubes
- 1/40 • • • • acting internally
- 1/42 • • • • acting externally
- 1/44 • • by plungers moving through folding dies
- 1/46 • • • and interconnecting side walls during such movement
- 1/48 • • • • by folding or tucking in locking flaps
- 1/50 • • • • • by interengaging tongues and slots
- 1/52 • • by reciprocating or oscillating members, e.g. fingers other than plungers and dies
- 1/54 • • • operating on moving material
- 1/56 • • by rotary members co-operating with blades
- 1/58 • • by moving endless belts
- 1/60 • Uniting opposed surfaces or edges; Taping
- 1/62 • • by adhesives

- 1/64 • • by applying heat or pressure
- 1/66 • • • high-frequency electric heating
- 1/68 • • by stitching, stapling, or riveting
- 1/70 • • • by corner stapling
- 1/72 • • by applying and securing strips or sheets
- 1/74 • Auxiliary operations
- 1/76 • • Opening and distending flattened articles
- 1/78 • • • mechanically
- 1/80 • • • pneumatically
- 1/82 • • Attaching windows
- 1/84 • • Forming valves or applying valve inserts (connection of valves to inflatable elastic bodies B60C 29/00)
- 1/86 • • Forming integral handles or mounting separate handles (making separate handles by multi-step processes B31D 1/06)
- 1/88 • • Printing or embossing
- 1/90 • • Attaching accessories not otherwise provided for, e.g. opening or closure devices, tear strings
- 1/92 • • Delivering
- 1/94 • • • singly or in succession
- 1/96 • • • • in overlapping arrangement
- 1/98 • • • in stacks or bundles

**Machinery for making boxes or cartons**

**3/00 Machinery characterised by making boxes or cartons by folding single-piece sheets, blanks, or webs**  
(B31B 5/00 takes precedence)

- 3/02 • and having means for feeding or positioning sheets, blanks, or webs
- 3/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 3/26 • and having means for folding sheets, blanks, or webs
- 3/28 • • around mandrels, including bottom-forming operations
- 3/30 • • the mandrels moving
- 3/32 • • • in circular paths
- 3/34 • • • about their own axes
- 3/36 • • by continuously feeding same to stationary members, e.g. plates, ploughs, cores

- 3/44 • • by plungers moving through folding dies
  - 3/46 • • • and interconnecting side walls during such movement
  - 3/48 • • • • by folding or tucking in locking flaps
  - 3/50 • • • • • by interengaging tongues and slots
  - 3/52 • • by reciprocating or oscillating members, e.g. fingers other than plungers and dies
  - 3/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 3/64 • • by applying heat or pressure
  - 3/72 • • by applying and securing strips or sheets
  - 3/74 • and having means for effecting auxiliary operations
  - 5/00 Machinery characterised by making boxes or cartons by folding single-piece sheets which can be set-up from a collapsed condition, including setting-up and recollapsing to break creases**
  - 5/02 • and having means for feeding or positioning sheets
  - 5/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 5/26 • and having means for folding sheets, blanks, or webs
  - 5/36 • • by continuously feeding same to stationary members, e.g. plates, ploughs, cores
  - 5/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 5/74 • and having means for effecting auxiliary operations
  - 5/76 • • Opening and distending flattened articles
  - 5/78 • • • mechanically
  - 5/80 • • • pneumatically
  - 7/00 Machinery characterised by making lined or internally-reinforced boxes or cartons (B31B 11/00 takes precedence)**
  - 7/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 7/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 7/26 • and having means for folding sheets, blanks, or webs
  - 7/28 • • around mandrels, including bottom-forming operations
  - 7/30 • • • the mandrels moving
  - 7/32 • • • • in circular paths
  - 7/44 • • by plungers moving through folding dies
  - 7/46 • • • and interconnecting side walls during such movement
  - 7/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 7/74 • and having means for effecting auxiliary operations
  - 9/00 Machinery characterised by making boxes or cartons having shouldered walls**
  - 9/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 9/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 9/26 • and having means for folding sheets, blanks, or webs
  - 9/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 9/74 • and having means for effecting auxiliary operations
  - 11/00 Machinery characterised by making boxes or cartons having partitions or like inserts not integral with walls (making partitions, inserts, or reinforcements for boxes or cartons B31D)**
  - 11/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 11/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 11/26 • and having means for folding sheets, blanks, or webs
  - 11/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 11/74 • and having means for effecting auxiliary operations
  - 13/00 Machinery characterised by assembling drawer-and-shell boxes or cartons**
  - 13/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 13/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 13/26 • and having means for folding sheets, blanks, or webs
  - 13/28 • • around mandrels, including bottom-forming operations
  - 13/30 • • • the mandrels moving
  - 13/32 • • • • in circular paths
  - 13/34 • • • • about their own axes
  - 13/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 13/74 • and having means for effecting auxiliary operations
  - 15/00 Machinery characterised by making covered or externally-reinforced boxes or cartons**
  - 15/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 15/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 15/26 • and having means for folding sheets, blanks, or webs
  - 15/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 15/74 • and having means for effecting auxiliary operations
  - 17/00 Machinery characterised by making other boxes or cartons by assembling several separate sheets, blanks, or webs**
  - 17/02 • and having means for feeding or positioning sheets, blanks, or webs
  - 17/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
  - 17/26 • and having means for folding sheets, blanks, or webs
  - 17/28 • • around mandrels, including bottom-forming operations
  - 17/30 • • • the mandrels moving
  - 17/32 • • • • in circular paths
  - 17/44 • • by plungers moving through folding dies
  - 17/46 • • • and interconnecting side walls during such movement
  - 17/52 • • by reciprocating or oscillating members, e.g. fingers other than plungers and dies
  - 17/60 • and having means for uniting opposed surfaces or edges, or for taping
  - 17/74 • and having means for effecting auxiliary operations
- Machinery for making envelopes or bags**
- Note(s)**
- Machinery for making boxes or cartons as well as envelopes or bags is classified in groups B31B 3/00- B31B 17/00.
- 19/00 Machinery characterised by making rectangular envelopes or bags of flat form, i.e. without structural provision at the base for thickness of contents (B31B 21/00, B31B 23/00 take precedence)**

- 19/02 • and having means for feeding or positioning sheets, blanks, or webs
- 19/10 • • Feeding or positioning webs
- 19/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 19/16 • • Cutting webs to form sheets or blanks
- 19/18 • • Slitting webs longitudinally
- 19/20 • • Cutting sheets or blanks
- 19/26 • and having means for folding sheets, blanks, or webs
- 19/36 • • by continuously feeding same to stationary members, e.g. plates, ploughs, cores
- 19/52 • • by reciprocating or oscillating members, e.g. fingers other than plungers and dies
- 19/60 • and having means for uniting opposed surfaces or edges, or for taping
- 19/62 • • by adhesives
- 19/64 • • by applying heat or pressure
- 19/66 • • • high-frequency electric heating
- 19/68 • • by stitching, stapling, or riveting
- 19/74 • and having means for effecting auxiliary operations
- 19/82 • • Attaching windows
- 19/84 • • Forming valves or applying valve inserts (connection of valves to inflatable elastic bodies B60C 29/00)
- 19/86 • • Forming integral handles or mounting separate handles (making separate handles by multi-step processes B31D 1/06)
- 19/88 • • Printing or embossing
- 19/90 • • Attaching accessories not otherwise provided for, e.g. opening or closure devices, tear strings
- 19/92 • • Delivering
- 19/94 • • • singly or in succession
- 19/96 • • • in overlapping arrangement
- 19/98 • • • in stacks or bundles
- 21/00 Machinery characterised by making rectangular envelopes or bags of flat form, i.e. without structural provision at the base for thickness of contents, from sheets or blanks, e.g. from flattened tubes**
- 21/02 • and having means for feeding or positioning sheets or blanks
- 21/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 21/26 • and having means for folding sheets or blanks
- 21/60 • and having means for uniting opposed surfaces or edges, or for taping
- 21/74 • and having means for effecting auxiliary operations
- 23/00 Machinery characterised by making rectangular envelopes or bags of flat form, i.e. without structural provision at the base for thickness of contents, from webs, e.g. from flattened tubular webs** (machinery characterised by cutting sheets or blanks from webs and working them to form such envelopes or bags B31B 21/00)
- 23/02 • and having means for feeding or positioning webs
- 23/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 23/26 • and having means for folding webs
- 23/60 • and having means for uniting opposed surfaces or edges, or for taping
- 23/74 • and having means for effecting auxiliary operations
- 25/00 Machinery characterised by making pointed or tapered envelopes or bags**
- 25/02 • and having means for feeding or positioning sheets, blanks, or webs
- 25/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 25/26 • and having means for folding sheets, blanks, or webs
- 25/60 • and having means for uniting opposed surfaces or edges, or for taping
- 25/74 • and having means for effecting auxiliary operations
- 27/00 Machinery characterised by making interconnected envelopes or bags**
- 27/02 • and having means for feeding or positioning sheets, blanks, or webs
- 27/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 27/26 • and having means for folding sheets, blanks, or webs
- 27/60 • and having means for uniting opposed surfaces or edges, or for taping
- 27/74 • and having means for effecting auxiliary operations
- 29/00 Machinery characterised by making envelopes or bags with structural provision at the base for thickness or contents** (B31B 31/00-B31B 37/00 take precedence)
- 29/02 • and having means for feeding or positioning sheets, blanks, or webs
- 29/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 29/26 • and having means for folding sheets, blanks, or webs
- 29/60 • and having means for uniting opposed surfaces or edges, or for taping
- 29/74 • and having means for effecting auxiliary operations
- 29/84 • • Forming valves or applying valve inserts (connection of valves to inflatable elastic bodies B60C 29/00)
- 31/00 Machinery characterised by making envelopes or bags with structural provision at the base for thickness of contents, from sheets or blanks, e.g. from flattened tubes** (B31B 33/00, B31B 35/00 take precedence)
- 31/02 • and having means for feeding or positioning sheets or blanks
- 31/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 31/26 • and having means for folding sheets or blanks
- 31/60 • and having means for uniting opposed surfaces or edges, or for taping
- 31/74 • and having means for effecting auxiliary operations
- 33/00 Machinery characterised by making envelopes or bags with structural provision at the base for thickness of contents, from sheets or blanks, e.g. from flattened tubes, the longitudinal axes of the envelopes or bags being parallel to the direction in which the sheets or blanks are fed**
- 33/02 • and having means for feeding or positioning sheets or blanks
- 33/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
- 33/26 • and having means for folding sheets or blanks
- 33/60 • and having means for uniting opposed surfaces or edges, or for taping
- 33/74 • and having means for effecting auxiliary operations

35/00	<b>Machinery characterised by making envelopes or bags with structural provision at the base for thickness of contents, from sheets or blanks, e.g. from flattened tubes, the longitudinal axes of the envelopes or bags being perpendicular to the direction in which the sheets or blanks are fed</b>	39/84	<ul style="list-style-type: none"> <li>• Forming valves or applying valve inserts (connection of valves to inflatable elastic bodies B60C 29/00)</li> </ul>
35/02	<ul style="list-style-type: none"> <li>• and having means for feeding or positioning sheets or blanks</li> </ul>	41/00	<b>Machinery characterised by making envelopes or bags of other specific form or construction</b>
35/14	<ul style="list-style-type: none"> <li>• and having means for cutting, e.g. perforating, punching, slitting, trimming</li> </ul>	41/02	<ul style="list-style-type: none"> <li>• and having means for feeding or positioning sheets, blanks, or webs</li> </ul>
35/26	<ul style="list-style-type: none"> <li>• and having means for folding sheets or blanks</li> </ul>	41/14	<ul style="list-style-type: none"> <li>• and having means for cutting, e.g. perforating, punching, slitting, trimming</li> </ul>
35/60	<ul style="list-style-type: none"> <li>• and having means for uniting opposed surfaces or edges, or for taping</li> </ul>	41/26	<ul style="list-style-type: none"> <li>• and having means for folding sheets, blanks or webs</li> </ul>
35/74	<ul style="list-style-type: none"> <li>• and having means for effecting auxiliary operations</li> </ul>	41/60	<ul style="list-style-type: none"> <li>• and having means for uniting opposed surfaces or edges, or for taping</li> </ul>
37/00	<b>Machinery characterised by making envelopes or bags with structural provision at the base for thickness of contents, from webs, e.g. from tubular webs</b> (machinery characterised by cutting sheets or blanks from webs and working them to form such envelopes or bags B31B 31/00)	41/74	<ul style="list-style-type: none"> <li>• and having means for effecting auxiliary operations</li> </ul>
37/02	<ul style="list-style-type: none"> <li>• and having means for feeding or positioning webs</li> </ul>	43/00	<b>Machinery characterised by making containers by shaping, otherwise than by folding, sheet material under pressure</b>
37/14	<ul style="list-style-type: none"> <li>• and having means for cutting, e.g. perforating, punching, slitting, trimming</li> </ul>	45/00	<b>Machinery characterised by making containers having corrugated or pleated walls</b>
37/26	<ul style="list-style-type: none"> <li>• and having means for folding webs</li> </ul>	47/00	<b>Hand tools for making envelopes, bags, boxes or cartons</b>
37/60	<ul style="list-style-type: none"> <li>• and having means for uniting opposed surfaces or edges, or for taping</li> </ul>	47/02	<ul style="list-style-type: none"> <li>• for making envelopes or bags without preshaped bottoms</li> </ul>
37/74	<ul style="list-style-type: none"> <li>• and having means for effecting auxiliary operations</li> </ul>	47/04	<ul style="list-style-type: none"> <li>• for making envelopes or bags with preshaped bottoms</li> </ul>
39/00	<b>Machinery characterised by making lined envelopes or bags</b>	49/00	<b>Machinery, accessories or processes not provided for in groups B31B 1/00-B31B 47/00</b> (forms or constructions of boxes, cartons, envelopes or bags B65D) [2]
39/02	<ul style="list-style-type: none"> <li>• and having means for feed or positioning sheets, blanks, or webs</li> </ul>	<b>Note(s)</b>	
39/14	<ul style="list-style-type: none"> <li>• and having means for cutting, e.g. perforating, punching, slitting, trimming</li> </ul>	Processes dependent on the use of specific machinery provided for in groups B31B 1/00-B31B 45/00 are classified in those groups.	
39/26	<ul style="list-style-type: none"> <li>• and having means for folding sheets, blanks or webs</li> </ul>	49/02	<ul style="list-style-type: none"> <li>• for making boxes or cartons</li> </ul>
39/60	<ul style="list-style-type: none"> <li>• and having means for uniting opposed surfaces or edges, or for taping</li> </ul>	49/04	<ul style="list-style-type: none"> <li>• for making envelopes or bags</li> </ul>
39/74	<ul style="list-style-type: none"> <li>• and having means for effecting auxiliary operations</li> </ul>		
<b>B31C</b>		<b>MAKING WOUND ARTICLES, e.g. WOUND TUBES</b> (characteristics relating to the working of plastics B29; shaping of plastics or substances in a plastic state B29C)	

**Note(s)**

In this subclass, the following term is used with the meaning indicated:

- "winding" means forming two or more complete convolutions.

**Subclass index****MAKING WOUND ARTICLES CHARACTERISED BY THE METHOD USED**

Winding around mandrels.....	1/00, 3/00
Winding without mandrels.....	5/00
Winding separate webs.....	9/00

**MAKING WOUND ARTICLES CHARACTERISED BY THE SHAPE OF THE ARTICLES PRODUCED**

Tubes.....	1/00, 3/00, 5/00
Cones.....	7/00
Other shapes.....	9/00, 99/00

**AFTER-TREATMENTS, COMBINED MACHINERY** .....11/00

**1/00** **Forming paper tubes or pipes by feeding at right angles to the winding mandrel centre line**

- 1/02 • Machines therefor having additional mandrels

- 1/04 • and forming a tube end into a container bottom

- 1/06 • and inserting into a tube end a bottom to form a container

## B31C

- |             |   |              |  |
|-------------|---|--------------|--|
| 1/08        | • Accessories of machines therefor not otherwise provided for                               | 7/08         | • Forming pointed cones  |
|             |   | 7/10         | • • on two or more mandrels  |
| <b>3/00</b> | <b>Forming paper tubes or pipes by feeding obliquely to the winding mandrel centre line</b> | <b>9/00</b>  | <b>Simultaneous forming of cylindrical and conical shapes by winding separate webs, e.g. forming bottles</b> (winding blanks B31B) |
| 3/02        | • and inserting into a tube end a bottom to form a container                                |              |  |
| 3/04        | • Seam processing   | <b>11/00</b> | <b>Paper-winding machinery combined with other machinery</b>   |
| <b>5/00</b> | <b>Forming paper tubes or pipes without mandrels</b>  | 11/02        | • for additionally shaping the articles  |
|             |   | 11/04        | • for applying impregnating by coating-substances during the winding   |
| <b>7/00</b> | <b>Forming conical paper articles by winding</b> (winding blanks B31B)                      | 11/06        | • for drying the wound and impregnated articles  |
| 7/02        | • Forming truncated cones   |              |  |
| 7/04        | • • on two or more mandrels   | <b>99/00</b> | <b>Subject matter not provided for in other groups of this subclass [2009.01]</b>  |
| 7/06        | • • • and inserting into a cone end a bottom to form a container                            |              |  |

**B31D MAKING OTHER PAPER ARTICLES** (manufacture by dry processes of articles made from particles or fibres consisting of wood or other lignocellulosic or like organic material B27N; making layered products not composed wholly of paper or cardboard B32B; making cardboard or paper D21F, D21H, making articles from wood pulp D21J)

### Note(s)

This subclass covers the making, otherwise than by winding, of articles other than boxes, cartons, envelopes, bags, and tubes from paper, other than from paper pulp.

- |             |  |              |   |
|-------------|--|--------------|---|
| <b>1/00</b> | <b>Multiple-step processes for making flat articles</b>                            | 3/04         | • cellular packaging articles, e.g. for bottles   |
| 1/02        | • the articles being labels or tags (means or processes for attaching threads D05) | <b>5/00</b>  | <b>Multiple-step processes for making three-dimensional articles</b> (assembly of garlands A41G 1/00; making receptacles or containers B31B; making tubes B31B, B31C) |
| 1/04        | • the articles being napkins, handkerchiefs, towels, doilies, or the like          | 5/02         | • including pressing  |
| 1/06        | • the articles being handles   | 5/04         | • including folding or pleating, e.g. Chinese lanterns  |
| <b>3/00</b> | <b>Making articles of cellular structure, e.g. insulating board</b>                | <b>99/00</b> | <b>Subject matter not provided for in other groups of this subclass [2006.01]</b>   |
| 3/02        | • honeycombed structures   |              |   |

**B31F MECHANICAL WORKING OR DEFORMATION OF PAPER OR CARDBOARD** (cutting, trimming, in general B26; incising, scoring, in general B26D 3/08; making layered products not composed wholly of paper or cardboard B32B; multi-ply material of paper or cardboard, its manufacture D21H)

- |             |   |             |  |
|-------------|---|-------------|--|
| <b>1/00</b> | <b>Mechanical deformation of paper or cardboard without removing material including combined deformation and laminating</b> (embossing combined with application of ink, type marking presses, selective embossing machines B41F, B41J, B41K, B41M; machines or apparatus for embossing decorations or marks B44B 5/00; artists hand tools for embossing B44B 11/04; producing decorative effects by processes for stamping ornamental designs on surfaces B44C 1/24; mechanical deformation during paper or board making, kinds of paper or board D21) [2] | 1/22        | • • Making webs in which the channel of each corrugation is longitudinal with the web feed   |
| 1/07        | • Embossing (corrugating B31F 1/20) [3]   | 1/24        | • • Making webs in which the channel of each corrugation is transverse to the web feed   |
| 1/08        | • Creasing (corrugating B31F 1/20; zig-zag folding B65H 45/20) [2]  | 1/26        | • • • by interengaging toothed cylinders [2]   |
| 1/10        | • • by rotary tools   | 1/28        | • • • • combined with uniting the corrugated webs to flat webs   |
| 1/12        | • Crêping paper   | 1/29        | • • • by making use of rods, e.g. co-operating with a toothed cylinder [2]   |
| 1/14        | • • by doctor blades arranged crosswise to the web  | 1/30        | • • • Tools secured to endless chains  |
| 1/16        | • • by elastic belts  | 1/32        | • • Corrugating already corrugated webs  |
| 1/18        | • • by tools arranged in the direction of web feed  | 1/36        | • Moistening and heating webs to facilitate mechanical deformation and drying deformed webs  |
| 1/20        | • Corrugating; Corrugating combined with laminating to other paper or cardboard layers (corrugating veneer B27D) [2]  | <b>5/00</b> | <b>Attaching together paper or cardboard sheets, strips, or webs; Reinforcing edges of paper or cardboard</b> (means for applying adhesive or glue B05C; stapling in box or like making B31B; attaching the replacement web to the expiring web during web-roll changing B65H 19/18; apparatus for splicing webs during handling B65H 21/00) |
|             |   | 5/02        | • by crimping or slotting  |



- 5/04 • by exclusive use of adhesives
- 5/06 • by adhesive tape
- 5/08 • • for reinforcing edges

## 7/00 Processes for working paper not otherwise provided for

- 7/02 • Breaking the coating on paper

## B32 LAYERED PRODUCTS

### B32B LAYERED PRODUCTS, i.e. PRODUCTS BUILT-UP OF STRATA OF FLAT OR NON-FLAT, e.g. CELLULAR OR HONEYCOMB, FORM

#### Note(s)

1. This subclass covers :
  - layered products comprising different kinds of material or layered products not characterised by the particular kind of material used;
  - a product similar to a layered product but comprising only material in the form of a sheet or network embedded in a mass of plastics or of physically-similar substances which mass penetrates the said sheet or network and lies on both sides of the latter (e.g. so that the sheet or network reinforces the plastics substance) provided that the embedded sheet or network extends coherently or connectedly over substantially the whole area of the product; thus the embedded sheet or network may be a fabric or a series of rods connected by cross wires. The manner of making such a product is, however, classified in this subclass only if it is essentially a process of building-up an assembly of layers of which at least one outer layer is preformed. If the embedded material comprises only a series of unconnected rods, the product is not classified in this subclass.
2. This subclass does not cover :
  - processes or apparatus used in, or in connection with, the production or treatment of any product, if the process or apparatus is solely applicable to and fully classifiable in a single other class or subclass for processes or apparatus, e.g. B05, B29C, B29D, B44D, C08J, C09J or C23;
  - compositions or preparation or treatment thereof, unless they are essentially restricted to layered products and cannot be fully classified in another class without ignoring this restriction;
  - etched metallic pattern on the surface of a printed circuit board.
3. In this subclass, a film formed on a layer by spreading a substance thereon is not considered to constitute a layer itself if it serves only as an adhesive or its purpose is merely to finish a surface of a product.
4. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "layer" is a sheet or strip or anything else having a small thickness relatively to its other dimensions which, together with at least one other layer, exists in a product, whether it pre-existed, e.g. as a separate sheet or strip, or was formed during the production of the layered product. It may or may not be homogeneous or cohesive; it may be an assembly of fibres or pieces of material. It may be discontinuous, e.g. in the form of a grating, honeycomb, or frame. It may or may not be in complete contact with the next layer, e.g. a corrugated layer against a flat layer;
  - "layered product" comprises at least two layers secured together. The term "secured" includes any method of uniting layers, e.g. needling, stitching, gluing, nailing, dovetailing or the interposition of an adhesive or adhesive impregnated support. It may also be an intermediate stage in the production of an article which is not layered in its final form, e.g. a panel with a protective layer which is stripped off when the panel is placed in its position of use. The layers are preformed layers or layers formed in situ on a preformed layer and may consist of coherent solid materials, including honeycombs and other cellular materials or of non-coherent solid materials composed of assemblies of strands, strips, fibres, tiles or the like;
  - "filamentary layer" means a layer of threads or filaments of any substance (e.g. wires) of more or less unlimited length placed in an orderly arrangement and secured together; it may be woven, knitted, braided, or netted, or formed of threads crossed or laid side and bonded together;
  - "fibrous layer" means a random assembly of fibres or filaments, usually of limited length, e.g. felt, fleece; the fibres may or may not be interengaged or connected, e.g. by adhesive.
5. In groups B32B 1/00-B32B 33/00, at each level of indentation, in the absence of an indication to the contrary, classification is made in the first appropriate place.
6. If a layered product is characterised by the way it is produced and not by its structure or composition, the production method should be classified in groups B32B 37/00 or B32B 38/00, or in subclass B29C, for example in groups B29C 45/16 or B29C 47/06.
7. The classification of layered products is provided for in many classes, most of which are confined to a particular kind of material. However, in order that this subclass may provide a basis for making a complete search with respect to layered products, all relevant subject matter is classified in this subclass even though it may also be classified in other classes.

#### Subclass index

#### LAYERED PRODUCTS CHARACTERISED BY

##### Their structure

general shape.....	1/00, 3/00
layer structure.....	3/00, 5/00
relation between layers.....	7/00

##### Substances used

bituminous or tarry substances, water-setting substances.....	11/00, 13/00
metal, glass, ceramics, mineral fibres or particles.....	15/00, 17/00, 18/00, 19/00
wood, paper, cellulosic plastic substances.....	21/00, 29/00, 23/00

rubber, synthetic resin.....	25/00, 27/00
other substances.....	9/00
Their properties.....	33/00
<b>MAKING LAYERED PRODUCTS</b>	
Methods or apparatus for laminating.....	37/00
Ancillary operations.....	38/00
Controlling or monitoring.....	41/00
Other operations, e.g. repairing.....	43/00

#### 1/00 Layered products essentially having a general shape other than plane

##### Note(s)

For classification of a product in this group, surface unevennesses or non-uniformities and the shape of individual layers are ignored.

- 1/02 • Receptacles, e.g. tanks
- 1/04 • characterised by feature of form at particular places, e.g. in edge regions
- 1/06 • characterised by fillings or added members in hollow portions
- 1/08 • Tubular products

#### 3/00 Layered products essentially comprising a layer with external or internal discontinuities or unevennesses, or a layer of non-planar form (continuous layers of fibres or filaments B32B 5/02; foamed layers B32B 5/18); Layered products essentially having particular features of form (B32B 1/00 takes precedence)

##### Note(s)

In this group, channels, voids, and cavities may be filled otherwise than with air, e.g. with gas, with liquid, with other material different from that of the layer in which they occur.

- 3/02 • characterised by features of form at particular places, e.g. in edge regions
- 3/04 • • characterised by a layer folded at the edge, e.g. over another layer
- 3/06 • • for securing layers together; for attaching the product to another member, e.g. to a support (use or provision of nails, stitches, or similar separate fastening elements for these purposes B32B 7/08)
- 3/08 • • characterised by added members at particular parts
- 3/10 • characterised by a discontinuous layer, i.e. apertured or formed of separate pieces of material

##### Note(s)

In this group, a series of spaced separate elements forming in effect a broken surface should be regarded as a layer.

- 3/12 • • characterised by a layer of regularly-arranged cells whether integral or formed individually or by conjunction of separate strips, e.g. honeycomb structure
- 3/14 • • characterised by a face layer formed of separate pieces of material
- 3/16 • • secured to a flexible backing
- 3/18 • • characterised by an internal layer formed of separate pieces of material
- 3/20 • • • of hollow pieces, e.g. tubes; of pieces with channels or cavities
- 3/22 • • • of spaced pieces

- 3/24 • • characterised by an apertured layer, e.g. of expanded metal (layer of netting or fibres B32B 5/02)
- 3/26 • characterised by a particular shape of the outline of the cross-section of a continuous layer; characterised by a layer with cavities or internal voids (regular cells B32B 3/12)
- 3/28 • • characterised by a layer comprising a deformed thin sheet, e.g. corrugated, crumpled (B32B 29/08 takes precedence) [3]
- 3/30 • • characterised by a layer formed with recesses or projections, e.g. grooved, ribbed

#### 5/00 Layered products characterised by the non-homogeneity or physical structure of a layer (B32B 9/00-B32B 29/00 take precedence)

##### Note(s)

In this group, fibres, filaments, granules, or powder forming or included in a layer may be impregnated, bonded together, or embedded in a substance such as synthetic resin. If the substance of the fibres, or the like, or the impregnating, bonding, or embedding substance, is important it is classified in the relevant group for the substance.

- 5/02 • characterised by structural features of a layer comprising fibres or filaments (formed of particles, e.g. chips, chopped fibres, powder, B32B 5/16)

##### Note(s)

This group covers, in addition to filamentary and fibrous layers as defined in Note (4) following the title of this subclass, layers of substances having an intrinsic fibrous nature (e.g. paper, wood), if the fibrous nature is important and the particular substance is not important.

- 5/04 • • characterised by a layer being specifically extensible by reason of its structure or arrangement
- 5/06 • • characterised by a fibrous layer needled to another layer, e.g. of fibres, of paper
- 5/08 • • the fibres or filaments of a layer being specially arranged or being of different substances
- 5/10 • • characterised by a fibrous layer reinforced with filaments
- 5/12 • • characterised by the relative arrangement of fibres or filaments of adjacent layers
- 5/14 • characterised by a layer differing constitutionally or physically in different parts, e.g. denser near its faces
- 5/16 • characterised by features of a layer formed of particles, e.g. chips, chopped fibres, powder
- 5/18 • characterised by features of a layer containing foamed or specifically porous material
- 5/20 • • foamed in situ
- 5/22 • characterised by the presence of two or more layers which comprise fibres, filaments, granules, or powder, or are foamed or specifically porous
- 5/24 • • one layer being a fibrous or filamentary layer

- 5/26 • • • another layer also being fibrous or filamentary
- 5/28 • • • impregnated with or embedded in a plastic substance
- 5/30 • • • one layer comprising granules or powder
- 5/32 • • • both layers being foamed or specifically porous

**7/00 Layered products characterised by the relation between layers, i.e. products essentially comprising layers having different physical properties or products characterised by the interconnection of layers** (in respect of orientation of features, *see* the relevant groups for the features concerned, e.g. B32B 5/02 for direction of fibres; in respect of substances B32B 9/00-B32B 29/00)

- 7/02 • in respect of physical properties, e.g. hardness
- 7/04 • characterised by the connection of layers
- 7/06 • • permitting easy separation
- 7/08 • • by mechanical connection, e.g. stitching (by interengagement of layers B32B 3/00, e.g. B32B 3/04, B32B 3/06, B32B 3/30; by needling fibrous layers B32B 5/06)
- 7/10 • • one or both of the layers having adhesive or inter-reactive properties
- 7/12 • • using an adhesive
- 7/14 • • • applied in stripes or other spaced arrangement

#### **Layered products characterised by particular substances used**

##### **Note(s)**

In groups B32B 9/00-B32B 29/00, the following expressions are used with the meanings indicated:

- "specific substance" covers specified alternative substances if they are all covered by a single main group;
- "particulate layer" means a layer of particles, e.g. chips, chopped fibres, powder.

**9/00 Layered products essentially comprising a particular substance not covered by groups B32B 11/00-B32B 29/00**

- 9/02 • comprising animal or vegetable substances
- 9/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
- 9/06 • • of paper or cardboard

**11/00 Layered products essentially comprising bituminous or tarry substances**

- 11/02 • with fibres or particles embedded in it or bonded with it
- 11/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
- 11/06 • • of paper or cardboard
- 11/08 • • of metal
- 11/10 • next to a fibrous or filamentary layer
- 11/12 • next to a particulate layer

**13/00 Layered products essentially comprising a water-setting substance, e.g. concrete, plaster, asbestos cement, or like builders' material**

- 13/02 • with fibres or particles embedded in it or bonded with it
- 13/04 • comprising such substances as the main or only constituent of a layer, next to another layer of a specific substance
- 13/06 • • of metal

- 13/08 • • of paper or cardboard
- 13/10 • • of wood; of wood particle board
- 13/12 • • of synthetic resin
- 13/14 • next to a fibrous or filamentary layer

**15/00 Layered products essentially comprising metal**

- 15/01 • all layers being exclusively metallic [3]
- 15/02 • in a form other than a sheet, e.g. wire, particles
- 15/04 • comprising metal as the main or only constituent of a layer, next to another layer of a specific substance
- 15/06 • • of rubber
- 15/08 • • of synthetic resin
- 15/082 • • • comprising vinyl resins; comprising acrylic resins [2006.01]
- 15/085 • • • comprising polyolefins [2006.01]
- 15/088 • • • comprising polyamides [2006.01]
- 15/09 • • • comprising polyesters [2006.01]
- 15/092 • • • comprising epoxy resins [2006.01]
- 15/095 • • • comprising polyurethanes [2006.01]
- 15/098 • • • comprising condensation resins of aldehydes, e.g. with phenols, ureas or melamines [2006.01]

- 15/10 • • of wood
- 15/12 • • of paper or cardboard
- 15/14 • next to a fibrous or filamentary layer
- 15/16 • next to a particulate layer
- 15/18 • comprising iron or steel
- 15/20 • comprising aluminium or copper

**17/00 Layered products essentially comprising sheet glass, or fibres of glass, slag or the like**

- 17/02 • in the form of fibres or filaments
- 17/04 • • bonded with or embedded in a plastic substance
- 17/06 • comprising glass as the main or only constituent of a layer, next to another layer of a specific substance
- 17/08 • • of cellulosic plastic substance
- 17/10 • • of synthetic resin
- 17/12 • next to a fibrous or filamentary layer

**18/00 Layered products essentially comprising ceramics, e.g. refractory products [4]**

**19/00 Layered products essentially comprising natural mineral fibres or particles, e.g. asbestos, mica**

- 19/02 • bonded with or embedded in a plastic substance
- 19/04 • next to another layer of a specific substance
- 19/06 • next to a fibrous or filamentary layer
- 19/08 • comprising asbestos

**21/00 Layered products essentially comprising wood, e.g. wood board, veneer, wood particle board**

- 21/02 • in the form of fibres, chips, or particles
- 21/04 • comprising wood as the main or only constituent of a layer, next to another layer of a specific substance
- 21/06 • • of paper or cardboard
- 21/08 • • of synthetic resin; of fibre-reinforced resin
- 21/10 • Next to a fibrous or filamentary layer
- 21/12 • next to a particulate layer
- 21/13 • all layers being exclusively wood [3]
- 21/14 • comprising wood board or veneer

**23/00 Layered products essentially comprising cellulosic plastic substances**

- 23/02 • in the form of fibres or filaments

- 23/04 • comprising such substance as the main or only constituent of a layer, next to another layer of a specific substance
- 23/06 • • of paper or cardboard
- 23/08 • • of synthetic resin
- 23/10 • next to a fibrous or filamentary layer
- 23/12 • next to a particulate layer
- 23/14 • characterised by containing special compounding ingredients
- 23/16 • • Modifying agents
- 23/18 • • Fillers
- 23/20 • comprising esters
- 23/22 • comprising ethers

**25/00 Layered products essentially comprising natural or synthetic rubber**

- 25/02 • with fibres or particles embedded in it or bonded with it
- 25/04 • comprising rubber as the main or only constituent of a layer, next to another layer of a specific substance
- 25/06 • • of paper or cardboard
- 25/08 • • of synthetic resin
- 25/10 • next to a fibrous or filamentary layer
- 25/12 • comprising natural rubber
- 25/14 • comprising copolymers in which synthetic rubber constituents predominate
- 25/16 • comprising polydienes or poly-halodienes
- 25/18 • comprising butyl or halobutyl rubber
- 25/20 • comprising silicone rubber

**27/00 Layered products essentially comprising synthetic resin**

- 27/02 • in the form of fibres or filaments
- 27/04 • as impregnant, bonding, or embedding substance
- 27/06 • as the main or only constituent of a layer next to another layer of a specific substance
- 27/08 • • of synthetic resin of a different kind
- 27/10 • • of paper or cardboard
- 27/12 • next to a fibrous or filamentary layer
- 27/14 • next to a particulate layer
- 27/16 • specially treated, e.g. irradiated
- 27/18 • characterised by the use of special additives
- 27/20 • • using fillers, pigments, thixotroping agents
- 27/22 • • using plasticisers
- 27/24 • • using solvents or swelling agents
- 27/26 • • using curing agents
- 27/28 • comprising copolymers of synthetic resins not wholly covered by any one of the following subgroups
- 27/30 • comprising vinyl resin; comprising acrylic resin
- 27/32 • comprising polyolefins
- 27/34 • comprising polyamides
- 27/36 • comprising polyesters
- 27/38 • comprising epoxy resins
- 27/40 • comprising polyurethanes
- 27/42 • comprising condensation resins of aldehydes, e.g. with phenols, ureas or melamines

**29/00 Layered products essentially comprising paper or cardboard**

- 29/02 • next to a fibrous or filamentary layer
- 29/04 • next to a particulate layer
- 29/06 • specially treated, e.g. surfaced, parchmented
- 29/08 • Corrugated paper, corrugated cardboard [3]

**33/00 Layered products characterised by particular properties or particular surface features, e.g. particular surface coatings (surface unevennesses or non-uniformities B32B 3/00); Layered products designed for particular purposes not covered by another single class**

**Methods or apparatus for making layered products; Treatment of the layers or of the layered products [2006.01]**

**Note(s) [2006.01]**

In groups B32B 37/00 and B32B 39/00, the following expressions are used with the meanings indicated:

- "laminating" means the action of combining previously unconnected layers to become one product whose layers will remain together;
- "partial laminating" occurs when one layer does not fully cover a surface of another layer, whereby the layer with the greater surface area is laminated on only part of its surface;
- "adhesive" means a layer, or part of a layer, applied in any state or in any manner, which is incorporated for the purpose of bonding.

**37/00 Methods or apparatus for laminating, e.g. by curing or by ultrasonic bonding [2006.01]**

- 37/02 • characterised by a sequence of laminating steps, e.g. by adding new layers at consecutive laminating stations [2006.01]
- 37/04 • characterised by the partial melting of at least one layer [2006.01]
- 37/06 • characterised by the heating method [2006.01]
- 37/08 • characterised by the cooling method [2006.01]
- 37/10 • characterised by the pressing technique, e.g. using direct action of vacuum or fluid pressure [2006.01]
- 37/12 • characterised by using adhesives [2006.01]
- 37/14 • characterised by the properties of the layers [2006.01]
- 37/15 • • with at least one layer being manufactured and immediately laminated before reaching its stable state, e.g. in which a layer is extruded and laminated while in semi-molten state [2006.01]
- 37/16 • • with all layers existing as coherent layers before laminating [2006.01]
- 37/18 • • • involving the assembly of discrete sheets or panels only [2006.01]
- 37/20 • • • involving the assembly of continuous webs only [2006.01]
- 37/22 • • • involving the assembly of both discrete and continuous layers [2006.01]
- 37/24 • • with at least one layer not being coherent before laminating, e.g. made up from granular material sprinkled onto a substrate (B32B 37/15 takes precedence) [2006.01]
- 37/26 • • with at least one layer which influences the bonding during the laminating process, e.g. release layers or pressure equalising layers [2006.01]
- 37/28 • involving assembly of non-flat intermediate products which are flattened at a later step, e.g. tubes [2006.01]
- 37/30 • Partial laminating [2006.01]

**38/00 Ancillary operations in connection with laminating processes [2006.01]**

38/04	• Punching, slitting or perforating [2006.01]	39/00	<b>Layout of apparatus or plants, e.g. modular laminating systems [2006.01]</b>
38/06	• Embossing [2006.01]	41/00	<b>Arrangements for controlling or monitoring lamination processes; Safety arrangements [2006.01]</b>
38/08	• Impregnating [2006.01]	41/02	• Safety arrangements [2006.01]
38/10	• Removing layers, or parts of layers, mechanically or chemically (punching, slitting or perforating B32B 38/04) [2006.01]	43/00	<b>Operations specially adapted for layered products and not otherwise provided for, e.g. repairing; Apparatus therefor [2006.01]</b>
38/12	• Deep-drawing [2006.01]		
38/14	• Printing or colouring [2006.01]		
38/16	• Drying; Softening; Cleaning [2006.01]		
38/18	• Handling of layers or the laminate [2006.01]		

## PRINTING

### B41 PRINTING; LINING MACHINES; TYPEWRITERS; STAMPS

#### B41B MACHINES OR ACCESSORIES FOR MAKING, SETTING, OR DISTRIBUTING TYPE; TYPE; PHOTOGRAPHIC OR PHOTOELECTRONIC COMPOSING DEVICES (photographic devices in general G03)

##### Subclass index

HAND COMPOSING.....	1/00
MECHANICAL COMPOSING	
Using prefabricated type; making type.....	3/00, 5/00
By casting the type.....	7/00, 9/00, 11/00
PHOTOGRAPHIC COMPOSING	
Machines composing lines prior to photography.....	15/00
Machines without means for composing lines prior to photography.....	17/00
Electronic machines.....	19/00
Equipment for special work.....	13/00
Details of machines; auxiliaries.....	21/00, 23/00
PREPARATION OF RECORD CARRIERS.....	25/00
CONTROL, INDICATING, SAFETY.....	27/00

#### **1/00 Elements or appliances for hand composition; Chases, quoins, or galleys**

- 1/02 • Printing letters; Type
- 1/04 • Quadrats or quads; Spaces or other justifiers
- 1/06 • for special purposes
- 1/08 • • for inserting latest news
- 1/10 • • for inserting advertisements
- 1/12 • • for setting musical notations
- 1/14 • Composing rules, e.g. of brass
- 1/16 • Reglets
- 1/18 • Chases
- 1/20 • Quoins or other binding means
- 1/22 • Composing tables; Type cases; Storage cabinets; Washing or cleaning devices therefor
- 1/24 • • Washing or cleaning devices
- 1/26 • Composing or setting sticks
- 1/28 • Galleys

- 5/12 • • for making type in the form of lines, e.g. by drawing or casting

- 5/14 • • for cutting spaces

#### **7/00 Kinds or types of apparatus for mechanical composition in which the type is cast or moulded from matrices**

- 7/02 • operating with fixed combinations of matrices (details B41B 9/00)
- 7/04 • • for casting individual characters or spaces, e.g. "monotype" machines
- 7/06 • • for composing, justifying, and casting complete lines of matrices, e.g. "monoline" machines
- 7/08 • operating with separate matrices for individual characters or spaces which are selected and assembled (details B41B 11/00)
- 7/10 • • in which a line is composed of matrices and in which single types or spaces are cast, e.g. stringer type
- 7/12 • • in which a justified line is composed of matrices and a type line is cast in one piece
- 7/14 • • • the matrices being composed by hand
- 7/16 • • • the lines of matrices being composed and justified by machine operation, e.g. "linotype", "intertype" machines
- 7/18 • • • • the matrices being guided by wires, e.g. "typograph" machines

##### Machines or other mechanical apparatus for composing

#### **3/00 Apparatus for mechanical composition using prefabricated type, i.e. without casting equipment**

- 3/02 • Mechanical composing machines using single types or logotypes and having slide magazines therefor, e.g. flat, cylindrical, radial, single magazines
- 3/04 • Means for distributing type
- 3/06 • Justifying means

#### **5/00 Devices for making type or lines (for mechanical composition B41B 7/00, B41B 9/00, B41B 11/00)**

- 5/02 • Matrices
- 5/04 • Casting devices
- 5/06 • • mechanically operated
- 5/08 • Tools or auxiliaries
- 5/10 • • for polishing or finishing type (polishing in general B24B)

#### **9/00 Details of, or accessories for, machines for mechanical composition using fixed combinations of matrices from which type is cast or moulded**

- 9/02 • Combinations of matrices
- 9/04 • Carriers for combinations of matrices, e.g. blocks, cylinders, wheels, bars
- 9/06 • Mechanisms for effecting relative movements of matrix carriers and moulds for character or space selection
- 9/08 • Moulding or casting devices

9/10	• • Moulds	11/76	• • • Pots (melting pots for casting stereotype plates B41D 3/20)
9/12	• • Justifying devices	11/78	• • • • movable towards, and away from, mould
9/14	• • Supply devices for molten metal	11/80	• • • • with stirrers or means for removing dross
9/16	• Devices for handling type after casting	11/82	• • • • associated with mechanisms for introducing metal in solid form
9/18	• • Ejector mechanisms	11/84	• • • • Throats or mouthpieces; Wipers for mouthpieces
9/20	• • Trimming devices	11/86	• • • • Heaters for pots; Temperature-control devices
<b>11/00</b>	<b>Details of, or accessories for, machines for mechanical composition using matrices for individual characters which are selected and assembled for type casting or moulding</b>	11/88	• • • Pumps; Stop-motions or safety devices therefor
11/02	• Matrices	11/90	• Arrangements or devices for distributing matrices or space bands after casting or moulding
11/04	• Space bands	11/92	• • Second elevators
11/06	• Storage devices for matrices or space bands	11/94	• • Screw conveyers
11/08	• • Magazines for matrices	11/96	• Devices for cooling or cleaning matrices
11/10	• • • for composing by hand		
11/12	• • • Attachment of magazines to machines; Magazine-selection or magazine-shift mechanisms (controlling selection or shifting B41B 27/42)		
11/14	• • • with escapement devices		
11/16	• • Boxes for space bands; Escapements or guides for releasing space bands		
11/18	• Devices or arrangements for assembling matrices and space bands (control devices therefor B41B 27/44)		
11/20	• • Assembler guide channels		
11/22	• • Assembler cover plates or framework		
11/24	• • Belt conveyers co-operating with assembler guides		
11/26	• • Devices for feeding or guiding space bands into association with matrices		
11/28	• • Star wheels or other stacking devices for matrices and space bands; Guides associated therewith		
11/30	• • Assembler elevators or associated mechanisms, e.g. braking devices, retaining pawls, line resistants, delivery slides		
11/32	• • Transfer channels or line-delivery carriages		
11/34	• • First elevators or associated mechanisms		
11/36	• • for presenting matrices or space bands directly to moulds		
11/38	• Devices for aligning or clamping lines of matrices and space bands		
11/40	• • Jaw clamps; Operating devices therefor		
11/42	• • • for quadding and centring		
11/44	• • • for justifying		
11/46	• • Aligning devices		
11/48	• • Cleaning devices for aligning jaws (cleaning matrices B41B 11/96)		
11/50	• • Vice frames; Devices for releasing or locking		
11/52	• Moulding or casting devices or associated mechanisms		
11/54	• • Moulds; Liners therefor		
11/56	• • • Mould wheels; Slides or driving gear therefor		
11/58	• • • • with locking wedges		
11/60	• • • • adjustable or removable		
11/62	• • • • with interchangeable moulds		
11/64	• • • • with a series of moulds and mechanism for selecting individual moulds		
11/66	• • • mounted on reciprocable carriages		
11/68	• • • with provision for adjusting length or width of slot; with a plurality of slots		
11/70	• • • for casting type-bars of special form, e.g. with projections		
11/72	• • Devices for trimming type-bars; Cleaning devices for trimming knives; Ejectors for type-bars		
11/74	• • Devices for supplying molten metal		
<b><u>Photographic or photoelectronic composing devices</u></b>			
<b>13/00</b>	<b>Equipment specially adapted for photographing mounted characters or the like, e.g. advertisements, lines</b>		
13/02	• the characters being composed or mounted by hand, and photographed simultaneously		
13/04	• • with means for justifying		
13/06	• • • by elastic or extensible type-line carriers		
13/08	• • • by optical line correction		
13/10	• the characters being progressively photographed one by one		
<b>15/00</b>	<b>Photographic composing machines with movable character carriers for composing lines of characters prior to photography</b>		
15/02	• with means for photographing complete lines		
15/04	• • and with carriers for individual characters		
15/06	• • and with carriers for complete sets of characters, e.g. slidable elongated members, rotary wheels		
15/08	• with means for photographing composed characters in succession		
15/10	• Details		
15/12	• • Character carriers; Cleaning devices therefor		
15/14	• • • with a single character, or with combinations of different styles of a single character		
15/16	• • • with combinations of different characters		
15/18	• • • with parts of characters for building up complex characters, e.g. oriental characters		
15/20	• • Devices for handling or storing character carriers		
15/22	• • • Magazines		
15/24	• • • for justifying purposes		
15/26	• • • for repeating a character		
15/28	• • Photographic devices (in general G03)		
15/30	• • • Composing cameras		
15/32	• • • Film-handling mechanisms		
15/34	• • • Adjusting enlargement or register; Correcting exposure time		
<b>17/00</b>	<b>Photographic composing machines having fixed or movable character carriers and without means for composing lines prior to photography</b>		
17/02	• with manually-adjustable character carriers to enable characters to be photographed in succession		
17/04	• with a carrier for all characters in at least one font		
17/06	• • with an adjustable carrier		
17/08	• • with a fixed carrier		
17/10	• • with a continuously-movable carrier		

- 17/12 • • with means for moving the optical path for photographing characters, e.g. intermittently
- 17/14 • • • continuously
- 17/16 • • with means for moving the film in its plane for photographing characters in succession
- 17/18 • Details
- 17/20 • • Character carriers; Cleaning devices therefor
- 17/22 • • • with a single character; with a single character in more than one style
- 17/24 • • • with all characters
- 17/26 • • • • on belts
- 17/28 • • • • on polygonal rods
- 17/30 • • • • on a sheet of square or rectangular shape
- 17/32 • • • • on a flat disc
- 17/34 • • • • on a cylinder
- 17/36 • • • with selection indicators
- 17/38 • • • with means for indicating the width
- 17/40 • • • • in caliper form
- 17/42 • • • • in coded form

#### 19/00 Photoelectronic composing machines [3]

- 19/01 • having electron-beam tubes producing an image of at least one character which is photographed [3]
- 19/02 • • the characters appearing on the screen in succession [3]
- 19/04 • • • at the same place [3]
- 19/06 • • • at different predetermined places [3]
- 19/08 • • with combinations of characters appearing on the screen at the same time [3]
- 19/10 • • • in unbroken lines or columns [3]
- 19/12 • • • in broken lines or columns [3]
- 19/14 • • • and presenting a text of more than one line [3]
- 19/16 • • Character carriers associated with electron-beam tubes [3]

#### 21/00 Common details of photographic composing machines of the kinds covered in groups B41B 17/00 and B41B 19/00

- 21/02 • Shutters in optical systems (in general G03B)
- 21/04 • • for selecting characters
- 21/06 • • for adjusting exposures
- 21/08 • Light sources; Devices associated therewith, e.g. control devices
- 21/10 • • Single light sources
- 21/12 • • Stroboscopic light sources
- 21/14 • • Combinations of light sources
- 21/16 • Optical systems (shutters B41B 21/02; light sources B41B 21/08)
- 21/18 • • defining a single optical path
- 21/20 • • • with means for moving stepwise
- 21/22 • • • with means for moving continuously
- 21/24 • • defining multiple optical paths
- 21/26 • • • with means for selecting individual optical paths (means for moving the optical path B41B 17/12)
- 21/28 • • • with means for fount selection
- 21/30 • Electron-beam tubes or charactrons (in general H01J 31/00)
- 21/32 • Film carriers; Film-conveying or -positioning devices (film-handling means in line-composing photographic devices B41B 15/32; machines with means for moving the film in its plane for photographing characters in succession B41B 17/16)
- 21/34 • • with positioning mechanisms
- 21/36 • • • for feeding films stepwise in line direction

- 21/38 • • • for feeding films continuously in line direction
- 21/40 • • • for line spacing
- 21/42 • • • for subscript or superscript notation
- 21/44 • • adjustable for enlarging purposes

#### 23/00 Auxiliary devices for modifying, mixing, or correcting text or layout in connection with photographic or photoelectronic composing

- 23/02 • for mixing by line-by-line projection of parts of texts from a number of films on to another
- 23/04 • for facilitating hand correction of texts
- 23/06 • for correcting texts by removing incorrect lines from one film and splicing-in corrected lines from another film

#### Marking record carriers used for controlling composing machines; Control, indicating, or safety devices or systems for composing machines of various kinds or types

#### 25/00 Apparatus specially adapted for preparation of record carriers for controlling composing machines (for casting individual characters or spaces, e.g. in "monotype" machines, B41B 7/04; methods for marking or reproducing record carriers having digital data thereon in general G06K 1/00)

- 25/10 • incorporating devices for line justification, e.g. counting and indicating devices for length of line
- 25/12 • • comprising elements which circulate from and to magazines
- 25/14 • • operating without space bands
- 25/16 • • using a binary code for the width of the matrices
- 25/18 • combined with type-setting machines
- 25/20 • Auxiliary devices; Devices serving special purposes
- 25/22 • • for indicating length of line
- 25/24 • • for error correction
- 25/26 • • for changing the fount of type

#### 27/00 Control, indicating, or safety devices or systems for composing machines of various kinds or types (computers in general G06F)

- 27/02 • Systems for controlling all operations
- 27/04 • • Keyboards
- 27/06 • • • operable by input of recorded or stored information, e.g. on punched tapes
- 27/08 • • • • from several sources
- 27/10 • • with direct control of all operations by input of recorded or stored information
- 27/12 • • • on tapes
- 27/14 • • • • on punched tapes
- 27/16 • • • • on magnetic tapes
- 27/18 • • • from memory devices
- 27/20 • • • • from electromagnetic devices, e.g. memory matrices
- 27/22 • • • from several sources
- 27/24 • • of several associated machines
- 27/26 • • with means for temporarily arresting input of recorded or stored information to introduce time delays
- 27/28 • Control, indicating, or safety devices for individual operations or machine elements (in devices for supplying molten metal B41B 11/86, B41B 11/88; for light sources B41B 21/08)
- 27/30 • • for arresting or varying speed of one operation in response to failure or variation in speed of another operation
- 27/32 • • for line-justification operations



- 27/34 • • • without the use of space bands
- 27/36 • • • using electronic devices
- 27/38 • • for measuring length of composed lines; for reading composed characters
- 27/40 • • for proof-printing operations
- 27/41 • • Printing mechanisms coupled to typographical composing machines
- 27/42 • • for controlling selection of shifting of matrix magazines

- 27/44 • • for controlling assembly of matrices and space bands
- 27/46 • • • for controlling insertion of space bands (for line justification B41B 27/32)
- 27/48 • • for deleting errors or inserting corrections (devices, non-fluid media or methods for cancelling or correcting errors in typewriters or selective printing mechanisms B41J 29/26)
- 27/50 • • operated by coupled machines

**B41C PROCESSES FOR THE MANUFACTURE OR REPRODUCTION OF PRINTING SURFACES** (photomechanical processes for producing printing surfaces G03F; photoelectrical processes for producing printing surfaces G03G)

**1/00 Forme preparation**

- 1/02 • Engraving; Heads therefor (recording on record carriers, heads therefor G11B) [5]

**Note(s)**

Attention is drawn to the title of class B41 and to subclass H04N, in particular to the Notes following the title of that subclass and to group H04N 1/00.

- 1/04 • • using heads controlled by an electric information signal
- 1/045 • • • Mechanical engraving heads [5]
- 1/05 • • • Heat-generating engraving heads, e.g. laser beam, electron beam [5]
- 1/055 • Thermographic processes for producing formes (B41C 1/02 takes precedence) [5]
- 1/06 • Transferring (B41C 1/10, B41C 1/18 take precedence) [5]
- 1/08 • by embossing, e.g. with a typewriter (typewriters adapted therefor B41J 3/38)

- 1/10 • for lithographic printing; Master sheets for transferring a lithographic image to the forme (B41C 1/055 takes precedence; neutralising or similar differentiation treatments of lithographic printing formes B41N 3/08) [5]

- 1/12 • Multicolour formes

- 1/14 • for stencil printing or silk-screen printing (B41C 1/055 takes precedence) [5]

- 1/16 • Formes with areas rendered ink-resistant by covering with an amalgam; Printing plates for amalgam printing [5]

- 1/18 • Curved printing formes or printing cylinders

**3/00 Reproduction or duplicating of printing formes**

- 3/02 • Stereotyping (casting stereotype plates B41D 3/00) [2]
- 3/04 • to produce rubber printing blocks
- 3/06 • to produce printing blocks from plastics
- 3/08 • Electrotyping; Application of backing layers thereon [5]

**B41D APPARATUS FOR THE MECHANICAL REPRODUCTION OF PRINTING SURFACES FOR STEREOTYPE PRINTING; SHAPING ELASTIC OR DEFORMABLE MATERIAL TO FORM PRINTING SURFACES** (marking or engraving metal by the action of a high concentration of electric current B23H 9/06; type, machines, or accessories for making, setting, or distributing type B41B; processes for the manufacture or reproduction of printing surfaces B41C; machines or apparatus for engraving in general, or for embossing B44B 3/00, B44B 5/00; chemical etching of metal C23F 1/00; electrolytic etching C25F 3/00; photomechanical reproduction G03F)

**1/00 Preparing or treating stereotype matrices**

- 1/02 • using brushes
- 1/04 • using cylinders or rollers
- 1/06 • using presses, e.g. toggle or like lever-and-link type presses
- 1/08 • • using hydraulic presses
- 1/10 • Performing secondary operations on matrices
- 1/12 • • Humidifying or moistening
- 1/14 • • Drying

- 3/12 • Multiple-mould stereotype casting machines
- 3/14 • Details
- 3/16 • • Matrix clamps
- 3/18 • • Devices for closing or opening moulds
- 3/20 • • Melting pots
- 3/22 • • • with pumps for conveying the molten metal into the casting chambers or boxes
- 3/24 • • • with control valves
- 3/26 • • • with devices for stirring the molten metal
- 3/28 • • Devices for cooling the moulds

**Producing printing surfaces**

**3/00 Casting stereotype plates; Machines, moulds, or devices therefor**

- 3/02 • Horizontal moulds for casting flat plates
- 3/04 • Moulds, e.g. horizontal, for casting curved, e.g. semi-cylindrical, plates
- 3/06 • • Vertical moulds
- 3/08 • Moulds, e.g. horizontal, for casting tubular, i.e. cylindrical, plates
- 3/10 • • Vertical moulds

**5/00 Working, treating, or handling stereotype plates**

- 5/02 • by bending
- 5/04 • of flat plates
- 5/06 • of curved plates

**7/00 Shaping elastic or deformable material, e.g. rubber, plastics material, to form printing surfaces** (making rubber printing blocks B41C 3/04)

- 7/02 • by impression

## B41D

- 7/04 • Forming printing surfaces by covering printing forms with a thin elastic skin, e.g. rubber foil, and retaining the latter thereon; Obtaining reduced or enlarged printing surfaces by using thin elastic transfer foils (pantographic instruments for copying, reducing, or enlarging B43L 13/10)

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B41F PRINTING MACHINES OR PRESSES** (machines for manufacturing footwear incorporating printing or embossing apparatus A43D, e.g. A43D 8/26, A43D 95/14; presses in general B30B; making of printing surfaces B41C, B41D; manifolding devices, office printing machines B41L; stencilling B41L; printing processes not dependent on the use of special machines B41M; duplicating or marking by sublimation or volatilisation of design B41M 5/035; thermography B41M 5/26; embossing decorations or marks B44B 5/00; handling thin or filamentary material B65H; electrography, electrophotography, magnetography G03G) **[4]**

### Note(s)

Attention is drawn to Notes (1) and (2) following the title of subclass B41L.

### Subclass index

PLATEN PRESSES.....	1/00
CYLINDER PRESSES.....	3/00
ROTARY MACHINES	
Letterpress, lithographic, intaglio machines.....	5/00, 7/00, 9/00
Other machines; combined machines.....	11/00, 17/00, 19/00
Details.....	13/00
Screen printers.....	15/00
Transfer printing machines.....	16/00
DETAILS	
Handling sheets or other surfaces to be printed; treating such surfaces.....	21/00, 25/00, 22/00, 23/00
Attaching printing elements; make-ready arrangements, impression or offset surfaces; inking.....	27/00, 30/00, 31/00
Auxiliary devices; cleaning.....	33/00, 35/00

- 1/00 Platen presses, i.e. presses in which printing is effected by at least one essentially-flat pressure-applying member co-operating with a flat type-bed**
- 1/02 • Hand-operated platen presses
- 1/04 • for mono-impression printing, e.g. on sheets
- 1/06 • • with platen maintained parallel to bed during movement (preparing stereotype matrices using presses B41D 1/06)
- 1/08 • • on webs
- 1/10 • for multi-impression printing in one or more colours, e.g. on webs
- 1/12 • • on sheets
- 1/14 • • • using swinging platens, or forme supports
- 1/16 • for offset printing
- 1/18 • for lithography
- 1/20 • for perfecting sheets, i.e. for printing on both sides of sheets
- 1/22 • specially adapted for printing heads, e.g. letter heads
- 1/24 • specially adapted for proof printing
- 1/26 • Details
- 1/28 • • Sheet-conveying, -aligning or -clamping devices (in general B65H)
- 1/30 • • • using rotary grippers
- 1/32 • • • using air pressure, e.g. vacuum
- 1/34 • • • Registering devices, e.g. gauges
- 1/36 • • • Clamps for conveying sheets and for holding same on the platens
- 1/38 • • Platens or type-beds
- 1/40 • • Inking units
- 1/42 • • • using flat inking elements, e.g. discs
- 1/44 • • • using inking ribbons
- 1/46 • • • using rollers

- 1/48 • • • pivoting around the platen or base
- 1/50 • • • supported on carriages for movement in or on runways
- 1/52 • • • • Carriage driving gear
- 1/54 • • Printing-pressure control devices
- 1/56 • • Auxiliary devices
- 1/58 • • • Arrangements of counting devices for counting sheets
- 1/60 • • Safety devices
- 1/62 • • • for preventing injury to operator
- 1/64 • • • • to the hands of the operator
- 1/66 • • • responsive to incorrect operating conditions
- 3/00 Cylinder presses, i.e. presses essentially comprising at least one cylinder co-operating with at least one flat type-bed**
- 3/02 • with impression cylinder or cylinders rotating unidirectionally
- 3/04 • • intermittently; Stop-cylinder presses
- 3/06 • • continuously
- 3/08 • • • Single-revolution presses
- 3/10 • • • Two-revolution presses
- 3/12 • • Twin presses, i.e. with more than one cylinder or type-bed
- 3/14 • with impression cylinder or cylinders rotating in opposite directions during each working cycle
- 3/16 • • Twin presses, i.e. with more than one cylinder or type-bed
- 3/18 • of special construction or for particular purposes
- 3/20 • • with fixed type-beds and travelling impression cylinders
- 3/22 • • • with more than one type-bed

- 3/24 • • • with cylinders travelling around type-beds having upper and lower printing surfaces
- 3/26 • • with type-beds and impression cylinders simultaneously movable relative to one another
- 3/28 • • Proof-print presses for relief printing, lithography or intaglio printing, i.e. presses for checking accuracy of printing surfaces
- 3/30 • • for lithography (proof-print presses B41F 3/28)
- 3/32 • • • Damping devices
- 3/34 • • • for offset printing
- 3/36 • • for intaglio or heliogravure printing (proof-print presses B41F 3/28)
- 3/38 • • • Wiping mechanisms
- 3/40 • • for perfecting sheets, i.e. for printing on both sides thereof
- 3/42 • • for multicolour printing on sheets
- 3/44 • • for monocolour or multicolour printing on one side of webs, or for perfecting webs, i.e. monocolour or multicolour printing on both sides of webs
- 3/46 • Details
- 3/48 • • Press frames
- 3/51 • • Type-beds; Supports therefor (B41F 3/52 take precedence) [3]
- 3/52 • • Apparatus for cooling, heating, or drying printing surfaces [3]
- 3/54 • • Impression cylinders; Supports therefor (blankets or like coverings B41N 10/00)
- 3/56 • • • Devices for adjusting cylinders relative to type-beds and setting in adjusted position
- 3/58 • • Driving, synchronising, or control gear
- 3/60 • • • for type-beds
- 3/62 • • • • Applications of linkwork or gearing for producing reciprocatory or angular motion
- 3/64 • • • • • of crank motions
- 3/66 • • • • • of rack-and-pinion gearing
- 3/68 • • • • • with pinion rotating unidirectionally
- 3/70 • • • • Applications of directly-coupled motors
- 3/72 • • • • • of fluid motors
- 3/74 • • • • Applications of clutches
- 3/76 • • • • Applications of braking devices or of devices for stopping type-bed in registered position
- 3/78 • • • • • Air cushions
- 3/80 • • • for impression cylinders
- 3/81 • • Inking units [3]
- 3/82 • Auxiliary devices
- 3/84 • • Arrangements of counting devices (in printing machines in general B41F 33/02) [2]
- 3/86 • • Numbering devices

### **Rotary machines**

#### **5/00 Rotary letterpress machines**

- 5/02 • for printing on sheets
- 5/04 • for printing on webs
- 5/06 • • with several printing units in sequential arrangement
- 5/08 • • with several printing units in both superimposed and sequential arrangement
- 5/10 • • with several printing units arranged side by side
- 5/12 • • for printing on one side and on the other side of webs between the same forme and impression cylinders

- 5/14 • • with several impression cylinders arranged around a forme cylinder
- 5/16 • • for multicolour printing
- 5/18 • • • using one impression cylinder co-operating with several forme cylinders
- 5/20 • specially adapted for proof printing
- 5/22 • for indirect printing [3]
- 5/24 • for flexographic printing [3]

#### **7/00 Rotary lithographic machines**

- 7/02 • for offset printing
- 7/04 • • using printing units incorporating one forme cylinder, one transfer cylinder, and one impression cylinder, e.g. for printing on webs
- 7/06 • • • for printing on sheets
- 7/08 • • using one transfer cylinder co-operating with several forme cylinders for printing on sheets or webs, e.g. sampling of colours on one transfer cylinder
- 7/10 • • using one impression cylinder co-operating with several transfer cylinders for printing on sheets or webs, e.g. satellite-printing units
- 7/12 • • using two cylinders one of which serves two functions, e.g. as a transfer and impression cylinder in perfecting machines
- 7/14 • • with two or more impression cylinders coacting with a single transfer cylinder
- 7/15 • • • for printing on more than one web simultaneously [6]
- 7/16 • for printing on non-deformable material, e.g. sheet metal
- 7/18 • specially adapted for proof printing
- 7/20 • Details
- 7/24 • • Damping devices
- 7/26 • • • using transfer rollers [3]
- 7/28 • • • using brushes
- 7/30 • • • using spraying elements
- 7/32 • • • Ducts, containers, or like supply devices for liquids
- 7/34 • • • Endless bands
- 7/36 • • • Inking-rollers serving also to apply ink repellent
- 7/37 • • • with supercooling for condensation of air moisture (cooling forme or impression cylinders B41F 13/22) [6]
- 7/38 • • • Absorbent pads
- 7/40 • • • Devices for tripping or lifting damping rollers; Supporting, adjusting, or removing arrangements therefor (such arrangements or devices for inking rollers B41F 31/30)

#### **9/00 Rotary intaglio printing presses**

- 9/01 • for indirect printing [3, 5]
- 9/02 • for multicolour printing
- 9/04 • specially adapted for proof printing
- 9/06 • Details
- 9/08 • • Wiping mechanisms
- 9/10 • • • with doctors, scrapers, or like devices
- 9/12 • • • with absorbent pads
- 9/14 • • • with continuous flexible surfaces, e.g. endless bands
- 9/16 • • • Removing or recovering ink from wiping mechanisms
- 9/18 • • Auxiliary devices for exchanging forme cylinders

11/00	<b>Rotary presses or machines having forme cylinders carrying a plurality of printing surfaces, or for performing letterpress, lithographic, or intaglio processes selectively or in combination</b>	13/66	• • • and stapling
11/02	• for securities (security printing B41M 3/14) [3]	13/68	• • Adding inserts
13/00	<b>Common details of rotary presses or machines</b>	13/70	• • Depositing
13/004	• Electric or hydraulic features of drives [6]	15/00	<b>Screen printers</b> (for selective printing B41J 2/005)
13/008	• Mechanical features of drives, e.g. gears, clutches [6]	15/02	• Manually-operable devices
13/012	• • Taking-up backlash [6]	15/04	• • for multicolour printing
13/016	• Brakes [6]	15/06	• • with auxiliary equipment, e.g. for drying printed articles
13/02	• Conveying or guiding webs through presses or machines (web handling in general B65H, e.g. step-by-step advancement B65H 20/00, turning or reversing B65H 23/32)	15/08	• Machines
13/03	• • Threading webs into printing machines [6]	15/10	• • for multicolour printing
13/04	• • intermittently	15/12	• • with auxiliary equipment, e.g. for drying printed articles
13/06	• • Turning-bar arrangements	15/14	• Details
13/08	• Cylinders	15/16	• • Printing tables
13/10	• • Forme cylinders	15/18	• • • Supports for workpieces
13/11	• • • Gravure cylinders [6]	15/20	• • • • with suction-operated elements
13/12	• • • Registering devices	15/22	• • • • for single sheets
13/14	• • • • with means for displacing the cylinders	15/24	• • • • for webs
13/16	• • • • with means for displacing the printing formes on the cylinders	15/26	• • • • for articles with flat surfaces
13/18	• • Impression cylinders	15/28	• • • • for elongated flat articles, e.g. strips, bands
13/187	• • • for rotogravure [6]	15/30	• • • • for articles with curved surfaces
13/193	• • Transfer cylinders; Offset cylinders [6]	15/32	• • • • for articles with conical surfaces
13/20	• • Supports for bearings or supports for forme, offset, or impression cylinders	15/34	• • Screens; Frames; Holders therefor
13/21	• • • Bearer rings [6]	15/36	• • • flat
13/22	• • Means for cooling or heating forme or impression cylinders	15/38	• • • curved
13/24	• • Cylinder-tripping devices; Cylinder-impression adjustments	15/40	• • Inking units
13/26	• • • Arrangement of cylinder bearings	15/42	• • • comprising squeegees or doctors
13/28	• • • • Bearings mounted eccentrically of the cylinder axis	15/44	• • Squeegees or doctors (doctors of rotary intaglio printing presses B41F 9/10)
13/30	• • • • Bearings mounted on sliding supports	15/46	• • • with two or more operative parts
13/32	• • • • Bearings mounted on swinging supports	16/00	<b>Transfer printing apparatus</b> (apparatus or machines for applying decalcomanias B65C) [4]
13/34	• • • • Cylinder-lifting or -adjusting devices	16/02	• for textile material [4]
13/36	• • • • Cams, eccentrics, wedges, or the like	17/00	<b>Printing apparatus or machines of special types or for particular purposes, not otherwise provided for</b> (hand stamps, plier-like tools for printing or punching tickets or the like B41K; addressing machines or other office printing equipment B41L; coding or marking of packaging material or of completed packages in packaging machines B65B 61/00; ticket-printing and issuing apparatus G07B)
13/38	• • • • electrically or magnetically operated	17/02	• for printing books or manifold sets
13/40	• • • • fluid-pressure operated	17/04	• for printing calendars
13/42	• • Guards or covers, e.g. for preventing ingress or egress of foreign matter	17/08	• for printing on filamentary or elongated articles or material, or on articles with cylindrical surfaces
13/44	• Arrangements to accommodate interchangeable cylinders of different sizes to enable machine to print on areas of different sizes	17/10	• • on articles or material of indefinite length, e.g. wires, hoses, tubes or yarns
13/46	• Printing units for inserting latest news	17/12	• • • at an angle to axis
13/48	• Arrangements to enable printing to be effected over selected areas of a single forme cylinder (by inking selected areas B41F 31/18)	17/13	• • • for printing on rolls of material, the roll serving as impression cylinder, e.g. strip printers [2009.01]
13/50	• • by effecting relative movement of forme and impression cylinders during printing cycle	17/14	• • on articles of finite length
13/52	• • by projecting and retracting parts of the surface of the forme cylinder	17/16	• • • on end or bottom surfaces thereof
13/54	• Auxiliary folding, cutting, collecting, or depositing of sheets or webs (in general B26D, B65H; gathering sheets or signatures in bookbinding B42C 1/00)	17/18	• • • on curved surfaces of articles of varying cross-section, e.g. bottles, lamp glasses
13/56	• • Folding or cutting	17/20	• • • on articles of uniform cross-section, e.g. pencils, rulers, resistors
13/58	• • • lengthwise	17/22	• • • • by rolling contact
13/60	• • • crosswise	17/24	• for printing on flat surfaces of polyhedral articles
13/62	• • • Folding-cylinders or drums	17/26	• • by rolling contact
13/64	• • Collecting	17/28	• for printing on curved surfaces of conical or frusto-conical articles

- 17/30 • for printing on curved surfaces of essentially spherical, or part-spherical, articles
- 17/32 • • on lamp bulbs
- 17/34 • • on articles with surface irregularities, e.g. fruit, nuts
- 17/36 • for printing on tablets, pills, or like small articles
- 17/38 • for printing on knitted fabrics
- 19/00 Apparatus or machines for carrying out printing operations combined with other operations** (auxiliary perforating apparatus associated with printing devices B41G 7/00; coding or marking in association with packaging B65B 61/00; label dispensers having printing equipment B65C) [2]
- 19/02 • with embossing (printing with a printer's forme combined with embossing B41M 1/24)
- 19/04 • • using intaglio printing formes and wipers
- 19/06 • • Printing and embossing between a negative and a positive forme after inking and wiping the negative forme; Printing from an ink band treated with colour or "gold"
- 19/08 • Simultaneous moulding and printing

#### **Common details of printing machinery**

- 21/00 Devices for conveying sheets through printing apparatus or machines** (through platen presses B41F 1/28; feeding sheets to or from printing apparatus or machines B65H)
- 21/02 • Pins [3, 5]
- 21/04 • Grippers [3, 5]
- 21/05 • • In-feed grippers [3, 5]
- 21/06 • • Suction-operated grippers
- 21/08 • Combinations of endless conveyers and grippers
- 21/10 • Combinations of transfer drums and grippers [3]
- 21/12 • Adjusting leading edges, e.g. front stops [3]
- 21/14 • Adjusting lateral edges, e.g. side stops [3]
- 22/00 Means preventing smudging of machine parts or printed articles** (B41F 23/00 takes precedence) [6]
- 23/00 Devices for treating the surfaces of sheets, webs, or other articles in connection with printing** (cleaning in general B08B; as a final step in the manufacture of such articles, *see* appropriate subclasses, e.g. B29C 71/00, D21H 23/00 or D21H 25/00; surface treatment in general, *see* the relevant places, e.g. applying liquids or other fluent materials B05, of metals C23G)
- 23/02 • by dampening (in rotary lithographic machines B41F 7/24)
- 23/04 • by heat drying, by cooling, by applying powders
- 23/06 • • Powdering devices, e.g. for preventing set-off
- 23/08 • Print-finishing devices, e.g. for glossing prints
- 25/00 Devices for pressing sheets or webs against cylinders, e.g. for smoothing purposes** (apparatus for taking-out curl from webs in general B65H 23/34)
- 27/00 Devices for attaching printing elements or formes to supports** (attaching by chemical means B41N 6/00) [5]
- 27/02 • Magnetic devices
- 27/04 • for attaching printing elements to flat type-beds
- 27/06 • for attaching printing elements to forme cylinders
- 27/08 • for attaching printing formes to flat type-beds
- 27/10 • for attaching non-deformable curved printing formes to forme cylinders
- 27/12 • for attaching flexible printing formes

- 27/14 • for attaching printing formes to intermediate supports, e.g. adapter members
- 30/00 Devices for attaching coverings or make-ready devices; Guiding devices for coverings** (make-ready devices B41N 6/00; blankets or like coverings B41N 10/00) [5]
- 30/02 • attaching to impression cylinders [5]
- 30/04 • attaching to transfer cylinders [5]
- 30/06 • attaching of endless or like continuously-fed coverings [5]
- 31/00 Inking arrangements or devices** (inking units for platen presses B41F 1/40; inking units for cylinder presses B41F 3/81; applying liquids or other fluent materials to surfaces, in general B05; for typewriters or selective printing mechanisms B41J)
- 31/02 • Ducts, containers, supply or metering devices (level control in general G05D 9/00) [3]
- 31/03 • • Ink agitators [6]
- 31/04 • • with duct-blades or like metering devices
- 31/05 • • • Positioning devices therefor [6]
- 31/06 • • Troughs or like reservoirs with immersed, or partly immersed, rollers or cylinders
- 31/07 • • • for rotogravure [6]
- 31/08 • • with ink-ejecting means, e.g. pumps, nozzles
- 31/10 • • Applications of feed or duct rollers (messenger or moving transfer rollers B41F 31/14)
- 31/12 • • • adjustable for regulating supply
- 31/13 • • Means for driving fountain rollers [6]
- 31/14 • • Applications of messenger or other moving transfer rollers
- 31/15 • Devices for moving vibrator-rollers [6]
- 31/16 • Continuous, e.g. endless, band apparatus
- 31/18 • for inking selected parts of printing formes
- 31/20 • Ink-removing or collecting devices
- 31/22 • for inking from interior of cylinder
- 31/24 • Absorbent pads
- 31/26 • Construction of inking rollers (inking-rollers serving also to apply ink repellent in rotary lithographic machines B41F 7/36)
- 31/28 • Spray apparatus, e.g. containing brushes
- 31/30 • Arrangements for tripping, lifting, adjusting, or removing inking rollers; Supports, bearings, or forks therefor
- 31/32 • • Lifting or adjusting devices (for damping rollers B41F 7/40)
- 31/34 • • • Cam, eccentric, wedge, or like devices
- 31/36 • • • fluid-pressure operated
- 31/38 • • • magnetically operated
- 33/00 Indicating, counting, warning, control, or safety devices** (arrangements of counting devices in platen presses B41F 1/00, in cylinder presses B41F 3/84, in typewriters or selective printing mechanisms B41J 29/20; ink supply or metering devices B41J 31/02; such devices in general, *see* the relevant subclasses, e.g. counting in general G06M) [3]
- 33/02 • Arrangements of indicating devices, e.g. counters [2]
- 33/04 • Tripping devices or stop-motions (cylinder-tripping devices of rotary presses or machines B41F 13/24; arrangements for tripping inking rollers B41F 31/30) [2]
- 33/06 • • for starting or stopping operation of sheet or web feed
- 33/08 • • for starting or stopping operation of cylinders

## B41F

- |       |  |       |   |
|-------|--|-------|---|
| 33/10 | • • for starting or stopping operation of damping or inking units  | 33/18 | • Web break detection (B41F 33/04 takes precedence) [6] |
| 33/12 | • • for starting or stopping the machine as a whole  |       |   |
| 33/14 | • • Automatic control of tripping devices by feelers, photoelectric devices, pneumatic devices, or other detectors | 35/00 | <b>Cleaning arrangements or devices</b>                 |
|       |  | 35/02 | • for forme cylinders                                   |
|       |  | 35/04 | • for inking rollers                                    |
| 33/16 | • Programming systems for automatic control of sequence of operations  | 35/06 | • for offset cylinders                                  |

**B41G APPARATUS FOR BRONZE PRINTING, LINE PRINTING, OR FOR BORDERING OR EDGING SHEETS OR LIKE ARTICLES; AUXILIARY APPARATUS FOR PERFORATING IN CONJUNCTION WITH PRINTING** (perforating in general B26D; production of decorations B44C; perforating in conjunction with sheet or web delivery B65H 35/00; folding or unfolding thin material, e.g. sheets, webs, B65H 45/00, B65H 47/00)

- |      |   |      |   |
|------|---|------|---|
| 1/00 | <b>Apparatus for bronze printing or for like operations</b> (applying granular materials or metallic foils for decorative purposes B44C 1/00) | 5/00 | <b>Apparatus for bordering or edging sheets or like articles, e.g. for producing black rims on mourning cards</b>   |
| 1/02 | • platen type   |      |   |
| 1/04 | • cylinder type   | 7/00 | <b>Auxiliary perforating apparatus associated with printing devices</b> (apparatus or machines for carrying-out printing operations combined with operations other than perforating B41F 19/00) |
| 3/00 | <b>Apparatus for printing lines</b>   |      |   |

**B41J TYPEWRITERS; SELECTIVE PRINTING MECHANISMS, i.e. MECHANISMS PRINTING OTHERWISE THAN FROM A FORME; CORRECTION OF TYPOGRAPHICAL ERRORS** (composing B41B; printing on special surfaces B41F; laundry marking B41K; erasers, rubbers or erasing devices B43L 19/00; fluid media for correction of typographical errors by coating C09D 10/00; recording the results of measuring G01; recognition or presentation of data, marking record carriers in digital fashion, e.g. by punching, G06K; franking or ticket-printing and issuing apparatus G07B; electric keyboard switches, in general H01H 13/70, H03K 17/94; coding in connection with keyboards or like devices, in general H03M 11/00; receivers or transmitters for transmission of digital information H04L; transmission or reproduction of documents, or the like, e.g. facsimile transmission, H04N 1/00; printing mechanisms specially adapted for apparatus, e.g. cash registers, weighing machines, producing records of their own performance, see the relevant subclasses)

### Note(s)

- This subclass covers:
  - manually controlled power-operated apparatus or apparatus of this type with additional control by input of recorded information, e.g. on punched cards or tapes;
  - the "print-out" features of apparatus controlled by record carriers or electric signals in so far as these are of general interest, e.g. impression, inking, line-spacing mechanisms, printing heads.
- This subclass does not cover:
  - electrical features of apparatus controlled by record carriers or electric signals and of interest apart from the "print-out" features of said apparatus;
  - apparatus controlled by record carriers or electric signals, as a whole.
- In this subclass, the following term is used with the meaning indicated:
  - "paper" covers also similar flexible copy material;
  - "printing material" covers both paper and temporary record carriers from which records are transferred to a paper, but does not cover printing masters, e.g. formes.

### Subclass index

#### KINDS OF APPARATUS

- |  |      |
|--|------|
| characterised by the mounting, arrangement, or disposition of the types or dies..... | 1/00 |
| characterised by the printing or marking process for which they are designed.....    | 2/00 |
| characterised by the purpose.....  | 3/00 |

#### COMMON DETAILS OR ACCESSORIES

- |  |                            |
|--|----------------------------|
| Character selection.....                                 | 5/00, 7/00                 |
| Hammer impression.....                                   | 9/00                       |
| Supporting or handling copy or duplicating material..... | 11/00-15/00                |
| Transfer material  |                            |
| of page-width.....                                       | 17/00                      |
| in ribbon form; ink ribbon cartridges.....               | 31/00, 33/00, 35/00, 32/00 |
| Inking.....  | 27/00                      |
| Spacing.....   | 19/00                      |
| Drives.....  | 23/00                      |
| Particular operations.....                               | 21/00                      |

Others.....25/00, 29/00, 35/00

### **Kinds of typewriters or of selective printing mechanisms**

- 1/00 Typewriters or selective printing mechanisms characterised by the mounting, arrangement, or disposition of the types or dies** (non-selective embossing B44B 5/00)
- 1/02 • with separate or detached types or dies
  - 1/04 • with types or dies carried upon levers or radial arms, e.g. manually operated (B41J 1/16 takes precedence)
  - 1/06 • • on power-operated levers or arms
  - 1/08 • with types or dies carried on sliding bars or rods
  - 1/10 • • on end surfaces thereof
  - 1/12 • • on side surfaces thereof, e.g. fixed thereto
  - 1/14 • • • the types or dies being movable relative to the bars or rods (mounted on flexible bars or rods B41J 1/16)
  - 1/16 • with types or dies arranged in stationary or sliding cases or frames or upon flexible strips, plates, bars, or rods
  - 1/18 • with types or dies strung on wires or rods
  - 1/20 • with types or dies mounted on endless bands or the like
  - 1/22 • with types or dies mounted on carriers rotatable for selection
  - 1/24 • • the plane of the type or die face being perpendicular to the axis of rotation (B41J 1/60 takes precedence)
  - 1/26 • • • Carriers moving for impression (B41J 1/27 takes precedence) [3]
  - 1/27 • • • Carriers moving during impression [3]
  - 1/28 • • • Carriers stationary for impression, e.g. with the types or dies not moving relative to the carriers
  - 1/30 • • • • with the types or dies moving relative to the carriers or mounted on flexible carriers
  - 1/32 • • the plane of the type or die face being parallel to the axis of rotation, e.g. with type on the periphery of cylindrical carriers (B41J 1/60 takes precedence)
  - 1/34 • • • Carriers rotating during impression
  - 1/36 • • • Carriers sliding for impression, e.g. manually operated
  - 1/38 • • • • power operated
  - 1/40 • • • Carriers swinging for impression
  - 1/42 • • • • about an axis parallel to the axis of rotation of the carrier
  - 1/44 • • • Carriers stationary for impression
  - 1/46 • • • • Types or dies fixed on wheel, drum, cylinder, or like carriers
  - 1/48 • • • • • with a plurality of carriers, one for each character space
  - 1/50 • • • • • with one or more carriers travelling across copy material in letter-space direction
  - 1/52 • • • • • with copy material moving in the letter-space direction, and carrier mounting being fixed relative to the machine
  - 1/54 • • • • Types or dies movable on wheel, drum, cylinder, or like carriers
  - 1/56 • • • • Types or dies on shuttles or like loose carriers
  - 1/58 • • • • Types or dies upon arcuate bars

- 1/60 • with types or dies on spherical, truncated-spherical, or like surfaces
- 2/00 Typewriters or selective printing mechanisms characterised by the printing or marking process for which they are designed** (mounting, arrangement, or disposition of types or dies B41J 1/00; marking methods B41M 5/00; structure or manufacture of heads, e.g. inductive, for recording by magnetisation or demagnetisation of a record carrier G11B 5/127; heads for reproducing capacitive information G11B 9/07) [5]
- Note(s)**
- 1. This group covers devices reproducing only a discrete number of tones, whereas group H04N 1/00 covers devices used for the reproduction of documents or the like, which devices are capable of reproducing continuous tone value scales.
- 2. In this group, the following expressions are used with the meanings indicated:
  - "ink jet" involves the projection of ink on to the printing material, e.g. paper, through a nozzle as a stream of droplets or particles of colouring matter;
  - "continuous ink jet" means a jet of ink transformed into a continuous stream of droplets or particles of colouring matter after having left the nozzle;
  - "ink spray" means a spray of ink transported by a stream of charged particles or air on to the printing material.
- 2/005 • characterised by bringing liquid or particles selectively into contact with a printing material (printing by selective application of impact or pressure on a printing or impression-transfer material B41J 2/22) [5]
- 2/01 • • Ink jet [5]
- 2/015 • • • characterised by the jet generation process (B41J 2/215 takes precedence) [5]
- 2/02 • • • • generating a continuous ink jet [5]
- 2/025 • • • • • by vibration [5]
- 2/03 • • • • • by pressure [5]
- 2/035 • • • • • by electric or magnetic field [5]
- 2/04 • • • • generating single droplets or particles on demand [5]
- 2/045 • • • • • by pressure, e.g. electromechanical transducers [5]
- 2/05 • • • • • produced by the application of heat [5]
- 2/055 • • • • • Devices for absorbing or preventing back-pressure [5]
- 2/06 • • • • • by electric or magnetic field [5]
- 2/065 • • • • • involving the preliminary making of ink protuberances [5]
- 2/07 • • • characterised by jet control (B41J 2/205 takes precedence) [5]
- 2/075 • • • • for many-valued deflection [5]
- 2/08 • • • • • charge-control type [5]
- 2/085 • • • • • Charge means, e.g. electrodes [5]
- 2/09 • • • • • Deflection means [5]
- 2/095 • • • • • electric field-control type [5]
- 2/10 • • • • • magnetic field-control type [5]
- 2/105 • • • • for binary-valued deflection [5]

- 2/11 • • • • for ink spray [5]
- 2/115 • • • • synchronising the droplet separation and charging time [5]
- 2/12 • • • • testing or correcting charge or deflection [5]
- 2/125 • • • • Sensors, e.g. deflection sensors [5]
- 2/13 • • • • for inclination of printed pattern [5]
- 2/135 • • • • Nozzles [5]
- 2/14 • • • • Structure thereof [5]
- 2/145 • • • • Arrangement thereof [5]
- 2/15 • • • • • for serial printing [5]
- 2/155 • • • • • for line printing [5]
- 2/16 • • • • Production of nozzles [5]
- 2/165 • • • • Prevention of nozzle clogging, e.g. cleaning, capping or moistening for nozzles [5]
- 2/17 • • • characterised by ink handling [5]
- 2/175 • • • • Ink supply systems [5]
- 2/18 • • • • Ink recirculation systems [5]
- 2/185 • • • • • Ink-collectors; Ink-catchers [5]
- 2/19 • • • • for removing air bubbles [5]
- 2/195 • • • • for monitoring ink quality [5]
- 2/20 • • • • for preventing or detecting contamination of compounds [5]
- 2/205 • • • for printing a discrete number of tones (B41J 2/21 takes precedence) [5]
- 2/21 • • • for multi-colour printing [5]
- 2/215 • • by passing a medium, e.g. consisting of an air or particle stream, through an ink mist [5]
- 2/22 • characterised by selective application of impact or pressure on a printing material or impression-transfer material [5]
- 2/225 • • ballistic, e.g. using solid balls or pellets [5]
- 2/23 • • using print wires [5]
- 2/235 • • • Print head assemblies [5]
- 2/24 • • • • serial printer type (B41J 2/25, B41J 2/265 take precedence) [5]
- 2/245 • • • • line printer type (B41J 2/25, B41J 2/265 take precedence) [5]
- 2/25 • • • • Print wires [5]
- 2/255 • • • • • Arrangement of the print ends of the wires [5]
- 2/26 • • • • • Connection of print wire and actuator [5]
- 2/265 • • • • Guides for print wires [5]
- 2/27 • • • Actuators for print wires [5]
- 2/275 • • • • of clapper type (B41J 2/28 takes precedence) [5]
- 2/28 • • • • of spring charge type, i.e. with mechanical power under electro-magnetic control [5]
- 2/285 • • • • of plunger type [5]
- 2/29 • • • • of moving-coil type [5]
- 2/295 • • • • using piezo-electric elements [5]
- 2/30 • • • Control circuits for actuators [5]
- 2/305 • • • Ink supply apparatus (ink ribbons, ink-ribbon mechanisms B41J 31/00-B41J 35/00) [5]
- 2/31 • • using a print element with projections on its surface impacted or impressed by hammers [5]
- 2/315 • characterised by selective application of heat to a heat sensitive printing or impression-transfer material (B41J 2/385, B41J 2/435 take precedence) [5]
- 2/32 • • using thermal heads [5]
- 2/325 • • • by selective transfer of ink from ink carrier, e.g. from ink ribbon or sheet [5]
- 2/33 • • • • from ink roller [5]
- 2/335 • • • Structure of thermal heads [5]
- 2/34 • • • • comprising semiconductors [5]
- 2/345 • • • characterised by the arrangement of resistors or conductors [5]
- 2/35 • • • providing current or voltage to the thermal head [5]
- 2/355 • • • • Control circuits for heating-element selection [5]
- 2/36 • • • • • Print density control [5]
- 2/365 • • • • • by compensation for variation in temperature [5]
- 2/37 • • • • • by compensation for variation in current [5]
- 2/375 • • • Protection arrangements against overheating [5]
- 2/38 • • Preheating, i.e. heating to a temperature insufficient to cause printing [5]
- 2/385 • characterised by selective supply of electric current or selective application of magnetism to a printing or impression-transfer material (B41J 2/005 takes precedence; electrography, magnetography G03G) [5]
- 2/39 • • using multi-stylus heads [5]
- 2/395 • • • Structure of multi-stylus heads [5]
- 2/40 • • • providing current or voltage to the multi-stylus head [5]
- 2/405 • • • • Selection of the stylus or auxiliary electrode to be supplied (electronic switching circuits in general H03K 17/00) [5]
- 2/41 • • for electrostatic printing (B41J 2/39 takes precedence) [5]
- 2/415 • • • by passing charged particles through a hole or a slit [5]
- 2/42 • • for heating selectively [5]
- 2/425 • • for removing surface layer selectively from electro-sensitive material, e.g. matel coated paper [5]
- 2/43 • • for magnetic printing [5]
- 2/435 • characterised by selective application of radiation to a printing material or impression-transfer material (optical elements, systems, or apparatus G02B; modulation or deflection of light G02F; electrophotography G03G) [5]
- 2/44 • • using single radiation source, e.g. lighting beams or shutter arrangements (B41J 2/475 takes precedence) [5]
- 2/445 • • • using liquid crystals [5]
- 2/447 • • using arrays of radiation sources (B41J 2/475 takes precedence) [6]
- 2/45 • • • using light-emitting diode arrays [5]
- 2/455 • • • using laser arrays [5]
- 2/46 • • • characterised by using glass fibres [5]
- 2/465 • • using masks, e.g. light-switching masks (photographic composing B41B) [5]
- 2/47 • • using the combination of scanning and modulation of light [5]
- 2/475 • • for heating selectively [5]
- 2/48 • • • melting ink on a film or melting ink granules [5]
- 2/485 • characterised by the process of building-up characters applicable to two or more kinds of printing or marking processes [5]
- 2/49 • • by writing [5]
- 2/495 • • by selective printing from a rotating helical member [5]
- 2/50 • • by the selective combination of two or more non-identical printing elements [5]
- 2/505 • • from an assembly of identical printing elements [5]



- 2/51 • • • serial printer type [5]
- 2/515 • • • line printer type [5]
- 2/52 • Arrangement for printing a discrete number of tones, not covered by group B41J 2/205, e.g. applicable to two or more kinds of printing or marking process (B41J 2/525 takes precedence; for photomechanical production G03F 5/00) [5]
- 2/525 • Arrangement for multi-colour printing, not covered by group B41J 2/21, e.g. applicable to two or more kinds of printing or marking process (for photomechanical production G03F 3/00) [5]
- 3/00 Typewriters or selective printing or marking mechanisms characterised by the purpose for which they are constructed** (cryptographic typewriters G09C 3/00) [5]
- 3/01 • for special character, e.g. for Chinese characters or bar codes [5]
- 3/24 • for perforating or stencil cutting using special types or dies
- 3/26 • for stenographic writing
- 3/28 • for printing downwardly on flat surfaces, e.g. of books, drawings, boxes
- 3/30 • for printing with large type, e.g. on bulletins, tickets
- 3/32 • for printing in Braille or with keyboards specially adapted for use by blind or disabled persons
- 3/34 • for printing musical scores
- 3/36 • for portability
- 3/37 • • Foldable typewriters [5]
- 3/38 • for embossing, e.g. for making matrices for stereotypes
- 3/39 • • hand-held (manually-controlled or manually-operable label dispensers having printing equipment B65C 11/02) [5]
- 3/407 • for marking on special material (printing on special surfaces B41F 17/00) [5]
- 3/413 • • for metal [5]
- 3/42 • Two or more complete typewriters coupled for simultaneous operation
- 3/44 • Typewriters or selective printing mechanisms having dual functions or combined with, or coupled to, apparatus performing other functions (printing mechanisms coupled to typographical composing machines B41B 27/41)
- 3/46 • • Printing mechanisms combined with apparatus providing a visual indication
- 3/50 • • Mechanisms producing characters by printing and also producing a record by other means (punching mechanisms G06K) [5]
- 3/51 • • • the printed and recorded information being identical; using type elements with code-generating means (G06K 1/12 takes precedence) [5]
- 3/54 • with two or more sets of type or printing elements (B41J 3/60 takes precedence) [5]
- 3/60 • for printing on both faces of the printing material [5]
- 3/62 • for printing on two or more separate sheets or strips of printing material (B41J 3/54 takes precedence) [5]
- Common details or accessories**
- 5/00 Devices or arrangements for controlling character selection** (methods or arrangements for sensing record carriers G06K 7/00)
- 5/02 • Character or syllable selected by setting an index
- 5/04 • • Single-character selection
- 5/06 • • Multiple-character selection
- 5/08 • Character or syllable selected by means of keys or keyboards of the typewriter type
- 5/10 • • Arrangements of keyboards
- 5/12 • • Construction of key buttons
- 5/14 • • Construction of key levers
- 5/16 • • Mounting or connecting key buttons on or to key levers
- 5/18 • • Locks
- 5/20 • • • for subsidiary keys, e.g. for shift keys
- 5/22 • • • Interlocks between keys, e.g. without detent arrangements
- 5/24 • • • • with detent arrangements
- 5/26 • • Regulating touch, key dip or stroke, or the like
- 5/28 • • Multiple-action keys, e.g. keys depressed by two or more amounts or movable in two or more directions to effect different functions or selections
- 5/30 • Character or syllable selection controlled by recorded information
- 5/31 • • characterised by form of recorded information
- 5/32 • • • by printed, embossed, or photographic records, e.g. cards, sheets
- 5/34 • • • • by strips or tapes
- 5/36 • • • by punched records, e.g. cards, sheets
- 5/38 • • • • by strips or tapes
- 5/40 • • • by magnetic or electrostatic records, e.g. cards, sheets
- 5/42 • • • • by strips or tapes
- 5/44 • • characterised by the kind of storage of recorded information
- 5/46 • • • the storage being on internal storages
- 5/48 • • • the storage being on external storages
- 5/50 • • • • on a single storage
- 5/51 • • • • on more than one separate storage, e.g. on additional correction strips or tapes [3]
- 5/52 • • characterised by the provision of additional devices for producing a punched or like record, e.g. simultaneously
- 7/00 Type-selecting or type-actuating mechanisms** (index setting B41J 5/02)
- 7/02 • Type-lever actuating mechanisms
- 7/04 • • Levers mounted on fixed pivots
- 7/06 • • • and connected to transmission members, e.g. toothed gearing
- 7/08 • • • • with pin-and-slot or like loose connections; Cam-slot members
- 7/10 • • • • Chain, belt, flexible-cable, or like members
- 7/12 • • • U-shaped type-lever on two pivots
- 7/14 • • • Single key-and-type lever
- 7/16 • • • Type-head pivoted to, or rotating on, lever
- 7/18 • • Levers having moving or variable fulcra to alter the mechanical advantage during the stroke
- 7/20 • • Levers having moving pivots fixed relative to the lever; Type-bars each pivoted on two links
- 7/22 • • Type-baskets; Bearings or hangers for type-levers
- 7/24 • • Construction of type-levers (U-shaped levers B41J 7/12)
- 7/26 • • Special means, e.g. repulsers, for ensuring return of type-levers
- 7/28 • • Key-lever and type-member returned independently to rest position
- 7/30 • • Preventing rebound or clash of levers or type-members
- 7/32 • Type-face selected by operation of sliding members
- 7/34 • Type-face selected by operation of rotary members

- 7/36 • Selecting arrangements applied to type-carriers rotating during impression
- 7/38 • • Type movable on carrier for selection
- 7/40 • • Type movable on carrier for impression
- 7/42 • • Timed impression, e.g. without impact
- 7/44 • • • with impact
- 7/46 • • Rolling contact during impression
- 7/48 • Type-carrier arrested in selected position by electromagnetic means
- 7/50 • Type-face selected by combinations of two movements of type-carrier
- 7/52 • • by combined rotary and sliding movement
- 7/54 • Selecting arrangements including combination, permutation, summation, or aggregation means
- 7/56 • • Summation devices for mechanical movements
- 7/58 • • • Wedges
- 7/60 • • • Levers
- 7/62 • • • Gearing
- 7/64 • • • Pulley-and-strand mechanism
- 7/66 • • Movable members, e.g. pins, displaceable according to a code
- 7/68 • • with means for selectively closing an electric circuit for type presentation
- 7/90 • Syllable, line, or like type selection
- 7/92 • Impact adjustment; Means to give uniformity of impression (B41J 9/46, B41J 9/48 take precedence) [5]
- 7/94 • • Character-by-character adjustment
- 7/96 • Means for checking correctness of setting
- 9/00 Hammer-impression mechanisms**
- 9/02 • Hammers; Arrangements thereof
- 9/04 • • of single hammers, e.g. travelling along printing line
- 9/06 • • • of stationary hammers, e.g. engaging a single type-carrier
- 9/08 • • • • engaging more than one type-carrier
- 9/10 • • of more than one hammer, e.g. one for each character position
- 9/12 • • • each operating in more than one character position
- 9/127 • • Mounting of hammers [3]
- 9/133 • • Construction of hammer body or tip [3]
- 9/14 • Means for selecting or suppressing individual hammers
- 9/16 • Means for cocking or resetting hammers
- 9/18 • • Cams
- 9/20 • • Springs
- 9/22 • • Fluid-pressure means
- 9/24 • • Electromagnetic means
- 9/26 • Means for operating hammers to effect impression
- 9/28 • • Cams
- 9/30 • • Springs
- 9/32 • • arranged to be clutched to snatch roll
- 9/34 • • Fluid-pressure means
- 9/36 • • in which mechanical power is applied under electromagnetic control
- 9/38 • • Electromagnetic means
- 9/40 • • including an electro-adhesive clutch
- 9/42 • with anti-rebound arrangements
- 9/44 • Control for hammer-impression mechanisms [5]
- 9/46 • • for deciding or adjusting hammer-firing time [5]
- 9/48 • • for deciding or adjusting hammer-drive energy [5]

- 9/50 • • for compensating for the variations of printer drive conditions, e.g. for compensating for the variation of temperature or current supply [5]
- 9/52 • • for checking the operation of print hammers [5]
- 9/54 • • • for checking the breakage of print hammers [5]
- 11/00 Devices or arrangements for supporting or handling copy material in sheet or web form** (specially adapted for supporting or handling copy material in short lengths B41J 13/00, in continuous form B41J 15/00; holders for text to be copied B41J 29/00)
- 11/02 • Platens
- 11/04 • • Roller platens
- 11/053 • • • with sound-deadening devices (structure of surface B41J 11/057) [3]
- 11/057 • • • Structure of the surface [3]
- 11/06 • • Flat page-size platens
- 11/08 • • Bar or like line-size platens
- 11/10 • • Anvil or like character-size platens
- 11/13 • • Backings or blankets (for roller platens B41J 11/057) [3]
- 11/14 • • Platen-shift mechanisms; Driving gear therefor
- 11/16 • • with balancing means
- 11/18 • Platen-impression arrangements
- 11/20 • Platen adjustments for varying the strength of impression, for a varying number of papers, for wear or for alignment
- 11/22 • Paper-carriage guides or races
- 11/24 • Detents, brakes, or couplings for feed rollers or platens
- 11/26 • Pin feeds
- 11/27 • • on or within the platen-rollers
- 11/28 • • Pin wheels
- 11/30 • • Pin traction elements other than wheels, e.g. pins on endless bands
- 11/32 • • Adjustment of pin wheels or traction elements, e.g. laterally
- 11/34 • • Guides coacting with pin feeds
- 11/36 • Blanking or long feeds; Feeding to a particular line, e.g. by rotation of platen or feed roller
- 11/38 • • Manually-operated feeding devices
- 11/40 • • specially adapted for printing musical scores
- 11/42 • • Controlling
- 11/44 • • • by devices, e.g. programme tape or contact wheel, moved in correspondence with movement of paper-feeding devices, e.g. platen rotation
- 11/46 • • • by marks or formations on the paper being fed
- 11/48 • Apparatus for condensed record, tally strip, or like work using two or more papers, or sets of papers
- 11/50 • • in which two or more papers or sets are separately fed in the same direction towards the printing position
- 11/51 • • • with different feed rates [3]
- 11/52 • • in which one paper or set is moved transversely relative to another
- 11/53 • • • Devices for holding in place one paper or set during replacement of one or more of the auxiliary papers or sets
- 11/54 • • in which one paper or set is fed towards printing position from the front of the apparatus
- 11/55 • • • with means for adjusting a paper or set [3]
- 11/56 • specially constructed to facilitate storage or transport of typewriter
- 11/58 • Supply holders for sheets or fan-folded webs, e.g. shelves, tables, scrolls, pile holders

- 11/60 • Erasing or correcting tables
- 11/62 • Shields or masks
- 11/64 • Applications of scales or indicators
- 11/66 • Applications of cutting devices
- 11/68 • • cutting parallel to the direction of paper feed
- 11/70 • • cutting perpendicular to the direction of paper feed
  
- 13/00 Devices or arrangements specially adapted for supporting or handling copy material in short lengths, e.g. sheets**
- 13/02 • Rollers (roller platens B41J 11/04)
- 13/03 • • driven, e.g. feed rollers separate from platen
- 13/036 • • co-operating with a roller platen [3]
- 13/042 • • • Front and rear rollers or sets of front or rear rollers each mounted on a separate carrier [3]
- 13/048 • • • Front and rear rollers both mounted on a common carrier [3]
- 13/054 • • • • on the paper apron concentric with the roller platen [3]
- 13/076 • • Construction of rollers; Bearings therefor
- 13/08 • Bands or like feeding devices
- 13/10 • Sheet holders, retainers, or stationary guides
- 13/12 • • specially adapted for cards, envelopes, or the like
- 13/14 • • Aprons or guides
- 13/16 • • • movable for insertion or release of sheets
- 13/18 • • • concentric with roller platen
- 13/20 • • Bails
- 13/22 • • Clamps or grippers
- 13/24 • • Strips for supporting or holding papers
- 13/26 • Registering devices
- 13/28 • • Front lays, stops, or gauges
- 13/30 • • Side lays or gauges
- 13/32 • • Means for positioning sheets in two directions under one control, e.g. for format control or orthogonal sheet positioning
  
- 15/00 Devices or arrangements specially adapted for supporting or handling copy material in continuous form, e.g. webs**
- 15/02 • Web rolls or spindles; Attaching webs to cores or spindles
- 15/04 • Supporting, feeding, or guiding devices; Mountings for web rolls or spindles
- 15/06 • • characterised by being applied to printers having stationary carriages
- 15/08 • • characterised by being applied to printers having transversely-moving carriages
- 15/10 • • • and mounted on the carriage
- 15/12 • • • and coupled to the carriage
- 15/14 • • • and detached from the carriage
- 15/16 • Means for tensioning or winding the web
- 15/18 • Multiple-web feeding apparatus
- 15/20 • • for webs superimposed during printing (machines for separating superposed webs B65H 41/00)
- 15/22 • • for feeding webs in separate paths during printing
- 15/24 • • with means for registering the webs with each other
  
- 17/00 Mechanisms for manipulating page-width impression-transfer material, e.g. carbon paper (in manifolding devices B41L; sheet material for duplicating or marking B41M 5/00)**
- 17/02 • Feeding mechanisms
- 17/04 • • Feed dependent on the record-paper feed, e.g. both moved at the same time
  
- 17/06 • • • "Creep" feed, i.e. impression-transfer material fed slower than the record paper
- 17/07 • • • electromagnetically controlled
- 17/08 • • Feed independent of the record-paper feed
- 17/10 • • • electromagnetically controlled
- 17/12 • • Special adaptations for ensuring maximum life
- 17/14 • • Automatic arrangements for reversing the feed direction
- 17/16 • Holders in the machine for sheets of impression-transfer material
- 17/18 • • pivotable to and from the platen
- 17/20 • • slidable to and from the platen
- 17/22 • Supply arrangements for webs or impression-transfer material
- 17/24 • • Webs supplied from reels or spools attached to the machine (reels *per se* B65H 75/02)
- 17/26 • • Webs supplied from trays or like supports attached to the machines
- 17/28 • Arrangements of guides for the impression-transfer material
- 17/30 • Constructions of guides for the impression-transfer material
- 17/32 • Detachable carriers or holders for impression-transfer material mechanism
- 17/34 • Backings for impression-transfer material, e.g. sheets for reducing friction, shields for preventing imprint
- 17/36 • Alarms, indicators, or feed-disabling devices responsive to material breakage or exhaustion
- 17/38 • for dealing with the impression-transfer material after use
- 17/40 • • for retracting sheets for re-use
- 17/42 • • for webs
  
- 19/00 Character- or line-spacing mechanisms (key actions B41J 25/02)**
- 19/02 • with retarding devices, e.g. brakes
- 19/04 • Sound-deadening or shock-absorbing devices or measures therein (B41J 19/38 takes precedence)
- 19/06 • • Resilient mounting of mechanism
- 19/08 • • Buffers, springs, or like carriage stops
- 19/10 • • Dash-pots
- 19/12 • • Gearing made of special material or specially constructed to reduce sound or shock
- 19/14 • with means for effecting line or character spacing in either direction
- 19/16 • Special spacing mechanisms for circular, spiral, or diagonal-printing apparatus
- 19/18 • Character-spacing or back-spacing mechanisms; Carriage-return or release devices therefor
- 19/20 • • Positive-feed character-spacing mechanisms (controlled by escapements B41J 19/52)
- 19/22 • • • acting by friction or gripping effect
- 19/24 • • • Pawl and ratchet
- 19/26 • • • • moving a paper or like carriage
- 19/28 • • • • moving a paper or like web or strip, e.g. over a stationary support
- 19/30 • • • Electromagnetically-operated mechanisms
- 19/32 • • • Differential or variable-spacing arrangements
- 19/34 • • Escapement-feed character-spacing mechanisms
- 19/36 • • • Driving mechanisms, e.g. springs stressed during carriage return
- 19/38 • • • • adapted for silent return
- 19/40 • • • Escapements having a single pawl or like detent
- 19/42 • • • Escapements having two pawls or like detents
- 19/44 • • • • coacting with two toothed members, e.g. racks or wheels

- 19/46 • • • • and mounted on a single rocker
- 19/48 • • • • and mounted on a single slider
- 19/50 • • • Electromagnetically-controlled escapements
- 19/52 • • • Escapements controlling positive-feed mechanism
- 19/54 • • • Construction of universal bars
- 19/56 • • • Escapements controlling web or strip feed
- 19/58 • • • Differential or variable-spacing arrangements
- 19/60 • • Auxiliary feed or adjustment devices
- 19/62 • • • for back-spacing
- 19/64 • • • for justifying
- 19/66 • • Carriage-release mechanisms
- 19/68 • • Carriage-return mechanisms, e.g. manually actuated
- 19/70 • • • power driven
- 19/72 • • • • with power stored during character spacing
- 19/74 • • with special means to maintain character-spacing or back-spacing elements in engagement during case-shift or like movement
- 19/76 • Line-spacing mechanisms (special line-feeds, e.g. long feeds, B41J 11/36)
- 19/78 • • Positive-feed mechanisms
- 19/80 • • • Pawl-and-ratchet mechanisms
- 19/82 • • • • moving a paper or like carriage
- 19/84 • • • • • in the form of a roller rotated for line spacing
- 19/86 • • • • • the pawl being normally in engagement with the ratchet
- 19/88 • • • • moving a type carriage
- 19/90 • • • • moving a paper or like web or strip, e.g. over a stationary support, automatically in response to movements other than carriage return
- 19/92 • • • Electromagnetically-operated mechanisms
- 19/94 • • • automatically operated in response to carriage return
- 19/96 • • • Variable-spacing arrangements
- 19/98 • • Escapement-feed mechanisms

**21/00 Column, tabular, or like printing arrangements; Means for centralising short lines** (carriage-release mechanisms B41J 19/66; key actions B41J 25/18)

- 21/02 • Stops or stop-racks
- 21/04 • Mechanisms for setting or restoring tabulation stops
- 21/06 • with means for preventing rebound from stops
- 21/08 • Mechanisms for initiating, effecting, skipping, or stopping tabulation movement; Means for centralising short lines
- 21/10 • with central, counter, or equivalent stop projected into path of tabulation stops
- 21/12 • characterised by arrangements of electrical contacts
- 21/14 • characterised by denominational arrangements
- 21/16 • controlled by the sensing of marks or formations on the paper being typed, an undersheet, or the platen
- 21/17 • controlled by stored information [5]
- 21/18 • characterised by applications of scales or indicators

**23/00 Power drives for actions or mechanisms** (B41J 9/00 take precedence)

- 23/02 • Mechanical power drives
- 23/04 • • with driven mechanism arranged to be clutched to continuously-operating power source
- 23/06 • • • by snatch rolls
- 23/08 • • • by one-revolution or part-revolution clutches
- 23/10 • • • and arrested in selected position

- 23/12 • • Mechanism driven by cams engaging rotating roller
- 23/14 • • Mechanism driven through an oscillating or reciprocating member
- 23/16 • • Mechanism driven by a spring tensioned by power means
- 23/18 • • Continuously-cycling drives
- 23/20 • Fluid-pressure power drives
- 23/22 • • for key or like type selection
- 23/24 • • for impression mechanisms
- 23/26 • • for platen or carriage movements, e.g. for line spacing, letter spacing, or carriage return
- 23/28 • • for type-carriage movements
- 23/30 • • for case shift
- 23/32 • Electromagnetic power drives, e.g. applied to key levers
- 23/34 • • applied to elements other than key levers
- 23/36 • • • and acting on type members
- 23/38 • • • and acting on aligning or case-shift mechanisms

**25/00 Actions or mechanisms not otherwise provided for**

- 25/02 • Key actions for specified purposes
- 25/04 • • Back-spacing
- 25/06 • • Carriage return
- 25/08 • • Case shift
- 25/10 • • Ink-ribbon adjustment
- 25/12 • • Character spacing
- 25/14 • • Line spacing
- 25/16 • • Line spacing and carriage return by a single key
- 25/18 • • Tabulating
- 25/20 • Auxiliary type mechanisms for printing distinguishing marks, e.g. for accenting, using dead or half-dead key arrangements, for printing marks in telegraph printers to indicate that machine is receiving
- 25/22 • for aligning characters for impression (in machines using index setting B41J 5/02)
- 25/24 • Case-shift mechanisms (B41J 11/14 takes precedence; key actions B41J 25/08); Fount-change arrangements
- 25/304 • Bodily-movable mechanisms for print heads or carriages movable towards or from paper surface (type carriers sliding for impression B41J 1/36; type carriers swinging for impression B41J 1/40) [5]
- 25/308 • • with print gap adjustment mechanisms [5]
- 25/312 • • with print pressure adjustment mechanisms, e.g. pressure-on-the-paper mechanisms [5]
- 25/316 • • with tilting motion mechanisms relative to paper surface [5]
- 25/32 • Impression mechanisms in which a roller co-operates with stationary type-faces
- 25/34 • Bodily-changeable print heads or carriages (B41J 1/20, B41J 1/22, B41J 1/60 take precedence) [5]

**27/00 Inking apparatus**

- 27/02 • with ink applied by pads or rotary discs
- 27/04 • • Pads or discs; Ink-supply arrangements therefor
- 27/06 • • Arrangements to ensure maximum life of pads or discs
- 27/08 • • Arrangements for multicolour work
- 27/10 • with ink applied by rollers; Ink-supply arrangements therefor
- 27/12 • • Rollers
- 27/14 • • Arrangements for multicolour work

- 27/16 • with ink deposited electrostatically or electromagnetically, e.g. powdered ink
- 27/18 • • with liquid ink deposited
- 27/20 • with ink supplied by capillary action, e.g. through porous type-members, through porous platens
- 27/22 • with inking discs or sectors
- 29/00 Details of, or accessories for, typewriters or selective printing mechanisms not otherwise provided for**
- 29/02 • Framework
- 29/04 • Means for attaching machines to baseboards
- 29/06 • Special supports, platforms, or trolleys for supporting machines on tables
- 29/08 • Sound-deadening or shock-absorbing stands, supports, cases, or pads separate from machines
- 29/10 • Sound-deadening devices embodied in machines (B41J 19/04 takes precedence)
- 29/12 • Guards, shields or dust excluders [5]
- 29/13 • • Cases or covers [5]
- 29/14 • Attachments operated by the leg, e.g. the foot or knee
- 29/15 • Script supports connected to the typewriter or printer (tables, desks, office furniture, in general A47B) [5]
- 29/16 • Auxiliary receptacles for articles, e.g. erasers, pencils
- 29/17 • Cleaning arrangements [5]
- 29/18 • Mechanisms for rendering the print visible to the operator (ink-ribbon shifts B41J 35/20) [5]
- 29/19 • • with reflectors or illuminating devices [5]
- 29/20 • Arrangements of counting devices
- 29/22 • • Line counters
- 29/24 • • Word counters
- 29/26 • Devices, non-fluid media or methods for cancelling, correcting errors, underscoring or ruling [4]
- 29/28 • • Writing or like instruments in holders or guides
- 29/30 • • Wheels
- 29/32 • • Type-members
- 29/34 • • • repeatedly actuated
- 29/36 • • for cancelling or correcting errors by overprinting (B41J 31/00 takes precedence) [4]
- 29/367 • • • sheet media carrying a pigmented transferable correction layer [4]
- 29/373 • • • sheet media bearing an adhesive layer effective to lift off wrongly typed characters [4]
- 29/377 • Cooling or ventilating arrangements [5]
- 29/38 • Drives, motors, controls, or automatic cut-off devices for the entire printing mechanism
- 29/387 • • Automatic cut-off devices [5]
- 29/393 • • Devices for controlling or analysing the entire machine [5]
- 29/40 • Means for printing fixed, i.e. unchanging, matter in addition to selectable matter
- 29/42 • Scales and indicators, e.g. for determining side margins
- 29/44 • • for determining top and bottom margins or indicating exhaust of paper
- 29/46 • Applications of alarms, e.g. responsive to approach of end of line (responsive to transfer-material breakage or exhaustion B41J 17/36, B41J 35/36)
- 29/48 • • responsive to breakage or exhaustion of paper or approach of bottom of paper
- 29/50 • Side-stop mechanisms
- 29/52 • Top-and-bottom stop mechanisms
- 29/54 • Locking devices applied to printing mechanisms
- 29/56 • • and manually actuated
- 29/58 • • and automatically actuated
- 29/60 • • • in response to failure of power supply

- 29/62 • • • by the absence of paper to lock hammer mechanism
- 29/64 • • • by a function of the printer to lock the keyboard
- 29/66 • • • • Locking devices actuated when platen reaches the end of a line
- 29/68 • • • by completion of a page or predetermined number of lines or exhaustion of paper to lock the keyboard
- 29/70 • • • Interlocks between any two carriage-moving mechanisms, e.g. character-space, back-space, tabulation, carriage-return, or carriage-release mechanisms

### **Ink ribbons; Ink-ribbon mechanisms**

- 31/00 Ink ribbons** (sheet material for duplicating or marking B41M 5/00; storing webs or tapes, e.g. on reels, B65H 75/00); **Renovating or testing ink ribbons**
- 31/02 • Ink ribbons characterised by the material from which they are woven
- 31/04 • • woven from synthetic material
- 31/05 • Ink ribbons having coatings other than impression-material coatings
- 31/06 • • the coatings being directly on the base material, i.e. below impression-transfer material; Ink ribbons having base material impregnated with material other than impression material
- 31/08 • • the coatings being superimposed on impression-transfer material
- 31/09 • Ink ribbons characterised by areas carrying media for obliteration or removal of typing errors [4]
- 31/10 • Ink ribbons having arrangements to facilitate threading through a machine
- 31/12 • Ink ribbons having arrangements to prevent undesired contact between the impression-transfer material and machine parts or other articles
- 31/14 • Renovating or testing ink ribbons
- 31/16 • • while fitted in the machine using the ink ribbons
- 32/00 Ink-ribbon cartridges [3]**
- 32/02 • for endless ribbons [3]
- 33/00 Apparatus or arrangements for feeding ink ribbons or like character-size impression-transfer material** (ink-ribbon cartridges B41J 32/00)
- 33/02 • Ribbon arrangements
- 33/04 • • mounted on moving carriages
- 33/06 • • Ribbons associated, but not moving, with typewriter platens, e.g. extending transversely to the length of the platen
- 33/08 • • • and extending parallel to the length of the platen
- 33/10 • • Arrangements of endless ribbons
- 33/12 • • Ribbons carried by coaxially-mounted spools
- 33/14 • Ribbon-feed devices or mechanisms
- 33/16 • • with drive applied to spool or spool spindle
- 33/18 • • • by ratchet mechanism (B41J 33/30 takes precedence)
- 33/20 • • • by friction
- 33/22 • • • by gears or pulleys
- 33/24 • • with drive applied directly to ribbon
- 33/26 • • • by rollers engaging the ribbon
- 33/28 • • • by mechanism pulling or gripping the ribbon
- 33/30 • • Escapement mechanisms
- 33/32 • • Electromagnetic devices

## B41J

- 33/34 • • driven by motors independently of the machine as a whole
- 33/36 • • with means for adjusting feeding rate
- 33/38 • • Slow, e.g. "creep", feed mechanisms
- 33/382 • • • the ribbon being fed only during carriage return
- 33/384 • • • • and attached to the carriage during writing
- 33/386 • • • the ribbon being fed only by operation of the line-spacing mechanism
- 33/388 • • • the ribbon being fed only when type impression takes place
- 33/40 • • with arrangements for reversing the feed direction
- 33/42 • • • manually
- 33/44 • • • automatically
- 33/46 • • • • and characterised by its application to mechanism in which two spools are driven by pawl-and-ratchet mechanism
- 33/48 • • • • • comprising two pawls and ratchets, one for each spool
- 33/50 • • • • • comprising a single pawl or integral double-tooth pawl selectively engageable with two ratchets, one for each spool
- 33/51 • • • • and characterised by the use of particular reversing control means
- 33/512 • • • • • using a pivoted reversing-feeler engaging the external periphery of the wound ribbon
- 33/514 • • • • • using a pivoted reversing-feeler engaging the interior of the wound ribbon
- 33/516 • • • • • using a reversing-feeler responsive to the tension of the ribbon
- 33/518 • • • • • the reversing-feeler engaging buttons or the like secured to the ribbon near its ends
- 33/52 • • Braking devices therefor
- 33/54 • • for ensuring maximum life of the ribbon (B41J 33/38 takes precedence; by adjustment of vibrator mechanisms B41J 35/14)
- 33/56 • • • Ribbon adjusted transversely
- 33/58 • • • Ribbon fed angularly

- 33/60 • • responsive to telegraph code or other extraneous signals
- 35/00 Other apparatus or arrangements associated with, or incorporated in, ink-ribbon mechanisms**
- 35/02 • Frames or holders for unwound short lengths of ink ribbons
- 35/03 • • the holder being movable to inoperative position, e.g. by swinging upwardly
- 35/04 • Ink-ribbon guides
- 35/06 • • stationary
- 35/08 • • with tensioning arrangements
- 35/10 • • Vibrator mechanisms; Driving gear therefor
- 35/12 • • • adjustable, e.g. for case shift (key actions B41J 25/02)
- 35/14 • • • • for multicolour work; for ensuring maximum life of ink ribbon; for rendering ink ribbon inoperative
- 35/16 • Multicolour arrangements (B41J 35/10 takes precedence)
- 35/18 • • Colour change effected automatically
- 35/20 • Ink-ribbon shifts, e.g. for exposing print, for case-shift adjustment, for rendering ink ribbon inoperative
- 35/22 • Mechanisms permitting the selective use of a plurality of ink ribbons
- 35/23 • • with two or more ribbon guides
- 35/24 • Mechanisms specially adapted for feeding impression-transfer materials of foil form
- 35/26 • Ink-ribbon shields or backings
- 35/28 • Detachable carriers or holders for ink-ribbon mechanisms
- 35/30 • Manifolding or like arrangements
- 35/32 • • for producing a plurality of copies along the printing line by a single ink ribbon
- 35/34 • • using a plurality of separate ink ribbons, e.g. including one hectographic ink ribbon
- 35/35 • • using unwound short lengths of ink ribbons
- 35/36 • Alarms, indicators, or feed-disabling devices responsive to ink-ribbon breakage or exhaustion
- 35/38 • Feeding the ink ribbon to waste after use

**B41K STAMPS; STAMPING OR NUMBERING APPARATUS OR DEVICES** (marking meat A22C 17/10; embossing combined with printing B41F 19/00; selective printing mechanisms B41J; embossing decorations or marks B44B 5/00; marking or coding completed packages B65B 61/26; ticket printing and issuing, fare registering, non-printing aspects of franking apparatus G07B)

### **1/00 Portable hand-operated devices without means for supporting or locating the articles to be stamped, i.e. hand stamps; Inking devices or other accessories therefor**

- 1/02 • with one or more flat stamping surfaces having fixed images
- 1/04 • • with multiple stamping surfaces; with stamping surfaces replaceable as a whole
- 1/06 • • with means for locating the image to be obtained
- 1/08 • with a flat stamping surface and changeable characters
- 1/10 • • having movable type-carrying bands or chains
- 1/12 • • having adjustable type-carrying wheels
- 1/14 • • having automatic means for changing type-characters
- 1/16 • • • Numbering devices
- 1/18 • • • • for pages
- 1/20 • • with means for locating the image to be obtained

- 1/22 • with curved stamping surfaces for stamping by rolling contact
- 1/24 • • Rocking stamps
- 1/26 • with stamping surfaces adapted for application to non-flat surfaces
- 1/28 • • flexible
- 1/30 • for offset or intaglio stamping
- 1/32 • for stencilling
- 1/34 • for multicolour stamping
- 1/36 • Details
- 1/38 • • Inking devices; Stamping surfaces
- 1/40 • • • Inking devices operated by stamping movement
- 1/42 • • • • with pads or rollers movable for inking
- 1/44 • • • for offset, intaglio, or stencil stamping
- 1/46 • • • for multicolour stamping
- 1/48 • • • with ink ribbons, ink sheets, or carbon tape or paper

- 1/50 • • • Stamping surfaces impregnated with ink, or made of material leaving a mark after stamping contact
- 1/52 • • • Ink reservoirs, e.g. integral with stamp handles
- 1/54 • • • Inking pads
- 1/56 • • Handles
- 1/58 • • Stands or other means for keeping hand stamps or the like within easy reach
- 3/00 Apparatus for stamping articles having integral means for supporting the articles to be stamped** (means for printing on articles of special shape or having a surface of particular configuration B41F 17/00)
- 3/02 • with stamping surface located above article-supporting surface
- 3/04 • • and movable at right angles to the surface to be stamped
- 3/06 • • • having type-carrying bands or chains
- 3/08 • • • having adjustable type-carrying wheels
- 3/10 • • • having automatic means for changing type-characters, e.g. numbering devices
- 3/12 • • with curved stamping surface for stamping by rolling contact
- 3/14 • • • for relief stamping
- 3/16 • • • for intaglio stamping
- 3/18 • • • for offset stamping
- 3/20 • • • for stencilling
- 3/22 • • • with means for producing distorted images
- 3/24 • • for multicolour stamping
- 3/26 • with stamping surface located below article-supporting surface
- 3/28 • • and bearing a positive image
- 3/30 • • • and having means for varying the image, e.g. by exchanging stamping plates in succession
- 3/32 • with co-operating stamping and counter-stamping members
- 3/34 • • in the form of indexable cylinders, e.g. of curved or polygonal cross-section, or of movable chains or bands
- 3/36 • with means for deforming or punching the copy matter
- 3/38 • • separate from the stamping means
- 3/40 • • for numerical or alphabetical characters
- 3/42 • Stamping apparatus with selection mechanisms for successively stamping and delivering lists or other items giving information, e.g. for warehouse administration, washing lists, supermarket guides
- 3/44 • Means for handling copy matter
- 3/46 • • for locating when stationary
- 3/48 • • for conveying intermittently to or from stamping station
- 3/50 • • for conveying during stamping operation
- 3/52 • • for discharging
- 3/54 • Inking devices
- 3/56 • • using inking pads
- 3/58 • • using ink ribbons, ink sheets, or carbon tape or paper
- 3/60 • • using rollers, e.g. rollers with integral ink-supply devices
- 3/62 • Details or accessories
- 3/64 • • Stamping mechanisms controlled by feed of copy matter
- 3/66 • • Safety devices, e.g. for preventing extraction of copy matter before completion of stamping operation
- 3/68 • • Cutting or severing devices (in general B26)
- 5/00 Plier-like tools for stamping, or stamping and delivering, tickets or the like**
- 5/02 • with means for varying the image stamped
- 5/04 • with devices for collecting counterfoils, or with other means for recording stamping operations (counting devices G06M)
- 5/06 • • for recording on separate tape
- 5/08 • • with counting devices
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B41L APPARATUS OR DEVICES FOR MANIFOLDING, DUPLICATING, OR PRINTING FOR OFFICE OR OTHER COMMERCIAL PURPOSES; ADDRESSING MACHINES OR LIKE SERIES-PRINTING MACHINES** (printing presses or machines for industrial purposes B41F; stamps, stamping or numbering devices B41K)

#### **Note(s)**

1. This subclass does not cover constituent parts common to manifolding by means of pressure-sensitive layers or intermediaries, to apparatus or machines for duplicating or printing for office or other commercial purposes, or to addressing machines or like series-printing machines, which are covered by subclass B41F.
2. In this subclass, as indicated by the references, groups B41L 15/00 and B41L 17/00 are intended to cover letterpress and lithographic printing apparatus only in so far as it is specially adapted for office or other commercial purposes; the general constructions or features of apparatus of these types are classified in subclass B41F. Constructions or features determining classification in these groups are, for example: ease of operation by clerical staff, cleanliness of operation in non-industrial environments, the use of printing surfaces constructed for the production of a limited number of copies.
3. In this subclass, the following terms are used with the meanings indicated:
  - "manifolding" means the obtaining of several copies simultaneously by means of pressure-sensitive layers when making an original;
  - "duplicating" means the obtaining of successive copies from a master, e.g. a hectographic image;
  - "stencilling" involves the use of a printing surface which is perforated to form the image, the ink flowing through the perforations on the copy material.

#### **Subclass index**

MANIFOLDING.....1/00, 3/00, 5/00  
 DUPLICATING  
   From hectographic masters.....7/00, 9/00, 11/00  
   By stencil.....13/00  
   Otherwise.....19/00

## PRINTING

Letterpress apparatus.....	15/00
Lithographic apparatus.....	17/00
Other apparatus.....	19/00

## COMMON DETAILS OR ACCESSORIES

Treatment of surfaces before printing; handling thereof.....	23/00, 21/00, 33/00
Impression or offset surfaces; moistening thereof.....	38/00, 25/00
Inking.....	27/00
Handling printing elements or formes.....	29/00-33/00
Cylinders; Attaching coverings or make-ready devices.....	35/00, 38/00
Auxiliary operations.....	39/00, 41/00, 43/00

## SPECIAL MACHINES FOR SERIES-PRINTING.....45/00, 47/00, 49/00

**Manifolding by means of pressure-sensitive layers or intermediaries****1/00 Devices for performing operations in connection with manifolding by means of pressure-sensitive layers or intermediaries, e.g. carbons; Accessories for manifolding purposes**

- 1/02 • Devices for preparatory operations, e.g. for bringing together sheets or webs and interposed carbons; Devices combined with devices for printing, for coating with carbon, for folding
- 1/04 • Devices for performing operations subsequent to manifolding, e.g. for separating single sheets or webs from single form sets, continuous manifold assemblies from carbons
- 1/06 • • on single form sets
- 1/08 • • on continuous manifold assemblies
- 1/10 • • • Separate folding or disposition of single webs
- 1/12 • • • Severing webs to obtain single sheets or forms, e.g. by cutting, by bursting
- 1/14 • • • Severing edge perforations from webs
- 1/16 • Carriers or supply devices for pressure-sensitive material, e.g. for carbon sheets; Carbon gloves
- 1/18 • • for carbon webs; Continuous carbon-supply mechanisms
- 1/20 • Manifolding assemblies, e.g. book-like assemblies
- 1/22 • • made up of single sheets or forms
- 1/24 • • • Pads or books
- 1/26 • • Continuous assemblies made up of webs
- 1/28 • • • in rolled or wound form
- 1/30 • • • folded longitudinally
- 1/32 • • • folded transversely
- 1/34 • • for making masters for hectographic duplicators
- 1/36 • • with pressure-sensitive layers or coating other than carbon (sheet materials B41M 5/00)

**3/00 Platens or like sheet supports for manifolding using pressure-sensitive layers or intermediaries, e.g. for book-keeping purposes**

- 3/02 • with stationary clamping means for holding the manifolding assembly in registered position, e.g. resilient clamps for holding non-perforated sheets
- 3/04 • • Bars provided with pins engaging perforations in the elements
- 3/06 • with movable clamping or guiding means for the elements of the manifolding assembly
- 3/08 • with non-mechanical means for holding the elements in registered position, e.g. magnetic means

- 3/10 • with means for moving assembled elements step by step relative to platen or support, e.g. for column or line selection; Means for locating assembled elements when stationary
- 3/12 • Auxiliary devices
- 3/14 • • Magazines or storage compartments, e.g. for slips
- 3/16 • • Web-feeding arrangements
- 3/18 • • Displaceable covers, e.g. with windows
- 3/20 • • for facilitating manifolding in books
- 3/22 • • Applications of ink ribbons; Holding, feeding, or guiding means therefor
- 5/00 **Autographic registers or like apparatus for manifolding by means of pressure-sensitive layers, using movable strips or webs** (movable-strip writing or reading apparatus B42D 19/00)
- 5/02 • with means for limiting movements of webs fed by hand
- 5/04 • with mechanisms for feeding webs or for arranging web feed; with web-storage arrangements
- 5/06 • • by means of rollers, wheels, or chains
- 5/08 • • by reciprocating mechanisms
- 5/10 • with mechanisms for feeding the pressure-sensitive web or webs separately from the other webs, e.g. transversely
- 5/12 • with means for indicating exhaustion of web supply
- 5/14 • with auxiliary means for printing, perforating, or severing the web
- 5/16 • Accessories, e.g. drawers for storing forms, for money (cash registers G07G)

**Apparatus or machines for duplicating or printing for office or other commercial purposes**

- 7/00 **Apparatus for directly duplicating from hectographic originals, i.e. for obtaining copies in mirror image**
- 7/02 • by passing original and copy-sheet or -web between rollers
- 7/04 • • with means for guiding original or copy-sheet or -web
- 7/06 • • with means for severing copy-sheet or -web
- 7/08 • • with means for moistening or drying
- 9/00 **Apparatus for indirectly duplicating from hectographic originals by means of hectographic intermediaries or transfer surfaces, i.e. "dry duplicators"**
- 9/02 • Containers for clay or gelatin
- 9/04 • with flat supports over which gelatin-paper is stretched



- 9/06 • • and with carriages for feeding the sheets
- 9/08 • • and with devices for rolling-in and securing hectographic gelatin-paper webs
- 9/10 • with rotary cylinders carrying sheets of hectographic gelatin-paper
- 11/00 Apparatus for directly duplicating from hectographic masters in mirror image, i.e. "wet duplicators" for producing positive copies**
- 11/02 • with a flat support carrying the masters
- 11/04 • • and with carriages for feeding the sheets
- 11/06 • • for stack duplicating with pressure rollers
- 11/08 • with rotary cylinders carrying the masters
- 11/10 • with two rollers between which master is stretched
- 11/12 • Driving gear; Control thereof
- 11/14 • Constructional features of masters (chemical aspects B41M)
- 13/00 Stencilling apparatus for office or other commercial use** (screen printing B41F 15/00; stencils, stencil materials, carriers therefor B41N 1/24)
- 13/02 • with flat stencil carriers
- 13/04 • with curved or rotary stencil carriers
- 13/06 • • with a single cylinder carrying the stencil
- 13/08 • • with stencil carried by two or more cylinders, e.g. through the intermediary of endless bands
- 13/10 • • • Clips or clamps for securing stencils to stencil carriers
- 13/12 • for special purposes, e.g. for reproducing Braille characters
- 13/14 • Attachments, e.g. for punching, cutting, severing
- 13/16 • Driving gear; Control thereof
- 13/18 • Inking units [3]
- 15/00 Letterpress printing apparatus specially adapted for office or other commercial purposes** (in general B41F; printing plates or foils, materials therefor B41N 1/00)
- 15/02 • with flat printing surfaces, e.g. with flat type-beds, surfaces made of thin sheet material or moulded from plastics or rubber
- 15/04 • • of composed type locked in chases
- 15/06 • with curved printing surfaces, e.g. cylinders
- 15/08 • • with stereotypes
- 15/10 • for multicolour printing; for perfecting
- 15/12 • Driving gear; Control thereof
- 15/14 • Attachments, e.g. for punching, cutting, severing
- 17/00 Lithographic printing apparatus for office or other commercial purposes** (in general B41F; printing plates or foils, materials therefor B41N 1/00)
- 17/02 • for direct impression printing
- 17/04 • • with flat printing surfaces
- 17/06 • • with curved printing surfaces, e.g. cylinders
- 17/08 • for offset printing
- 17/10 • • with flat printing surfaces, e.g. co-operating with travelling offset cylinders
- 17/12 • • with curved printing surfaces, e.g. forme cylinders
- 17/14 • of two-cylinder type, e.g. co-operating forme and impression cylinders
- 17/16 • of three-cylinder type
- 17/18 • for multicolour printing, e.g. tandem machines; for perfecting
- 17/20 • without damping means, e.g. using heat-activatable inks, refrigerated printing surfaces
- 17/22 • Driving gear; Control thereof
- 17/24 • Attachments, e.g. for punching, cutting, severing
- 19/00 Duplicating or printing apparatus or machines for office or other commercial purposes, of special types or for particular purposes and not otherwise provided for** (addressing machines B41L 45/00)
- 19/02 • having forme cylinders carrying a plurality of printing surfaces, or for performing letterpress and lithographic processes selectively or in combination (in general B41F 11/00)
- 19/04 • for printing from selected parts of one or more printing surfaces in one cycle, e.g. line printing (by inking selected areas B41L 27/20)
- 19/06 • • with co-operating forme and impression cylinders
- 19/08 • • • by effecting relative movement of forme and impression cylinders during printing cycle
- 19/10 • • • by projecting and retracting parts of the surfaces of the forme cylinders
- 19/12 • • • by masking parts of the printing surfaces on the forme cylinders
- 19/14 • • • by selective damping of the copy material
- 19/16 • • • by selective tripping of impression cylinders
- Common details of, or accessories for, apparatus or machines for manifold, duplicating, or printing for office or other commercial purposes**
- 21/00 Devices for conveying sheets or webs of copy material through apparatus or machines for manifold, duplicating, or printing** (mechanisms for conveying copy material through addressing machines or like series-printing machines B41L 47/24)
- 21/02 • for conveying sheets
- 21/04 • • Pins
- 21/06 • • Grippers
- 21/08 • • • Suction-operated grippers
- 21/10 • • Combinations of endless conveyers and grippers
- 21/12 • for conveying webs
- 23/00 Devices for treating the surface of sheets, webs, or other articles in connection with printing** (cleaning in general B08B, of metals C23G; as a final step in the manufacture of such articles, see the relevant places, e.g. B29C 71/00, D21H 23/00 or D21H 25/00; after-treatment of prints B41M 7/00)
- 23/02 • by damping, e.g. by moistening copy-sheets in connection with hectographic printing
- 23/04 • • using friction rollers
- 23/06 • • using brushes
- 23/08 • • using spray elements
- 23/10 • • using endless bands
- 23/12 • • using absorbent pads
- 23/14 • • Ducts, containers, or like supply devices for liquids
- 23/16 • • Devices for tripping or lifting damping rollers; Supporting, adjusting, or removing arrangements therefor
- 23/18 • • Construction of damping rollers
- 23/20 • by heat drying, by cooling, by applying powders
- 23/22 • • Powdering devices, e.g. for preventing set-off
- 23/24 • Print-finishing devices, e.g. for glossing prints
- 25/00 Devices for damping printing surfaces, e.g. moistening printing surfaces in connection with lithographic printing** (applying liquids or other fluent materials to surfaces, in general B05)
- 25/02 • using friction rollers
- 25/04 • using brushes

## B41L

- 25/06 • using spraying elements
- 25/08 • using endless bands
- 25/10 • using absorbent pads
- 25/12 • Ducts, containers, or like supply devices for liquids
- 25/14 • Inking rollers serving also to apply ink repellent
- 25/16 • Devices for tripping or lifting damping rollers; Supporting, adjusting, or removing arrangements therefor
- 25/18 • Construction of damping rollers
- 27/00 Inking arrangements or devices** (inking units for stencilling apparatus B41L 13/18; applying liquids or other fluent materials to surfaces, in general B05) [3]
  - 27/02 • adapted for inking by hand
  - 27/04 • Ducts, containers, supply devices or ink-level control devices (level control in general G05D 9/00) [3]
    - 27/06 • • Duct-blades or like supply devices
    - 27/08 • • Troughs or like reservoirs with immersed, or partly immersed, rollers
    - 27/10 • • with ink-ejection means, e.g. pumps, nozzles
    - 27/12 • • Feed or duct rollers (messenger or moving transfer rollers B41L 27/16)
      - 27/14 • • • adjustable for regulating supply
      - 27/16 • • Messenger or other moving transfer rollers
    - 27/18 • Continuous, e.g. endless-band, apparatus
    - 27/20 • for inking selected parts of printing formes
    - 27/22 • Ink-removing or collecting devices
    - 27/24 • for inking from interior of cylinder
    - 27/26 • Absorbent pads
    - 27/28 • Construction of inking rollers
    - 27/30 • Spray apparatus, e.g. containing brushes
    - 27/32 • Arrangements for tripping, lifting, adjusting, or removing inking rollers; Supports, bearings, or forks therefor
      - 27/34 • • Lifting or adjusting devices
      - 27/36 • • • Cams, eccentrics, wedges, or the like devices
      - 27/38 • • • fluid-pressure operated
      - 27/40 • • • magnetically operated
- 29/00 Devices for attaching printing elements or formes to supports**
  - 29/02 • magnetic
  - 29/04 • for attaching printing elements to flat type-beds
  - 29/06 • for attaching printing elements to forme cylinders
  - 29/08 • for attaching printing formes to flat type-beds
  - 29/10 • for attaching non-deformable curved printing formes to forme cylinders
  - 29/12 • for attaching flexible printing formes
  - 29/14 • • Clamping devices
  - 29/16 • • • operating automatically during operation of rotary machines to attach the printing formes to the forme cylinders
    - 29/18 • • • • electromagnetic, pneumatic, or hydraulic
  - 29/20 • • • for adjusting position of leading edges of flexible printing formes circumferentially of forme cylinders
  - 29/22 • for attaching printing formes to intermediate supports, e.g. adapter members
- 31/00 Devices for removing flexible printing formes from forme cylinders**
- 33/00 Pressing flexible printing formes or sheets or webs of copy material against cylinders, e.g. for smoothing purposes**

- 35/00 Cylinders for apparatus or machines for manifolding, duplicating, or printing for office or other commercial purposes**
  - 35/02 • Forme cylinders
  - 35/04 • • Registering devices
    - 35/06 • • • with means for displacing the cylinders
    - 35/08 • • • with means for displacing the printing formes on the cylinders
  - 35/10 • Impression cylinders
  - 35/12 • Bearings or supports for forme, offset or transfer, or impression cylinders
  - 35/14 • Means for heating or cooling forme or impression cylinders
  - 35/16 • Cylinder-tripping devices; Cylinder-impression adjustments
  - 35/18 • • Arrangements or dispositions of cylinder bearings, forks, or supports
    - 35/20 • • • Eccentric bearings
    - 35/22 • • • Sliding bearings
    - 35/24 • • • Swinging bearings
  - 35/26 • • Cylinder-lifting or adjusting devices
    - 35/28 • • • Cams, eccentrics, wedges, or the like
    - 35/30 • • • electrically or magnetically operated
    - 35/32 • • • fluid-pressure operated
  - 35/34 • Guards or covers, e.g. for safety purposes, for preventing egress or ingress of foreign matter
- 38/00 Devices for attaching coverings or make-ready devices; Guiding devices for coverings** (make-ready devices B41N 6/00; blankets or like coverings B41N 10/00) [5]
  - 38/02 • attaching to impression cylinders [5]
  - 38/04 • attaching of endless or like continuously-fed coverings [5]
- 39/00 Indicating, counting, warning, control or safety devices** (ink-level control devices B41L 27/04; such devices in general, see the relevant subclasses, e.g. counting in general G06M) [3]
  - 39/02 • Indicating devices, e.g. counters
  - 39/04 • Tripping devices or stop-motions
  - 39/06 • • for starting or stopping operation of sheet or web feed
    - 39/08 • • for starting or stopping operation of cylinders
    - 39/10 • • for starting or stopping operation of damping or inking units
    - 39/12 • • for starting or stopping the machines as a whole
    - 39/14 • • Automatic control of tripping devices by feelers, photoelectric devices, pneumatic devices, or other detectors
  - 39/16 • Programming systems for automatic control of sequence of operations
- 41/00 Cleaning arrangements or devices**
  - 41/02 • for forme cylinders
  - 41/04 • for inking rollers
  - 41/06 • for offset cylinders
- 43/00 Auxiliary folding, collecting, or depositing of sheets or webs**
  - 43/02 • Folding
    - 43/04 • • lengthwise
    - 43/06 • • crosswise
    - 43/08 • • Folding-cylinders or -drums
  - 43/10 • Collecting
    - 43/12 • • and stapling

- 43/14 • Adding inserts
- 43/16 • Depositing

#### **Addressing machines or like series-printing machines**

##### **45/00 Kinds or types of addressing machines or of like series-printing machines**

- 45/02 • using printing plates
- 45/04 • • composed on type-setting machines
- 45/06 • • for addressing combined with other operations, e.g. franking, collating documents
- 45/08 • with printing surfaces in the form of belts, or carried by chains
- 45/10 • • for addressing combined with other operations, e.g. franking, collating documents
- 45/12 • with separate devices for printing additional texts or images, e.g. for printing receipts on blank sheets or webs

##### **47/00 Details of addressing machines or like series-printing machines** (common details of printing machines B41F 21/00-B41F 35/00)

- 47/02 • Applications of printing surfaces in addressing machines or like series-printing machines (printing surfaces in general B41N)
- 47/04 • • of flat or curved plates for relief printing
- 47/06 • • of flat or curved stencils
- 47/08 • • of flat or curved plates for hectographic printing
- 47/10 • • of printing surfaces in the form of belts or chains
- 47/12 • Auxiliary devices, e.g. for flattening plates, for assembling plates in predetermined order, for wetting stencils
- 47/14 • Devices or arrangements for storing or handling plates
- 47/16 • • Magazines
- 47/18 • • Devices for feeding the plates in their plane
- 47/20 • • Devices for feeding the plates otherwise than in their plane, e.g. transversely thereto
- 47/22 • • with means for presenting plates for repeated printing operations
- 47/24 • Mechanisms for conveying copy material through addressing machines or like series-printing machines (in general B65H)
- 47/26 • • for conveying or positioning single sheet-like articles, e.g. envelopes

- 47/28 • • with gauging-rulers or the like, e.g. for facilitating hand-printing of copy material fed from stacks
- 47/30 • • for conveying webs
- 47/32 • • • combined with devices for other purposes, e.g. for cutting, severing, gluing
- 47/34 • • • specially adapted for conveying chains of forms
- 47/36 • • for conveying sheets or webs for tabulating purposes; Tabulating mechanisms combined with sheet or web conveyers
- 47/38 • • • with clamping means for head or margin
- 47/40 • • • with means for automatically reciprocating sheet or web transversely to enable addresses to be printed in columns side by side
- 47/42 • Printing mechanisms
- 47/44 • • using flat platens
- 47/46 • • using line-contact members, e.g. rollers, cylinders
- 47/48 • • with inking or ink-ribbon devices
- 47/50 • • using multiple impression-members or -surfaces, e.g. for printing series of addresses with standing context, for printing from selected parts of printing surfaces (applications of counting, numbering, or dating apparatus B41L 49/02)
- 47/52 • • with movable counter-pressure plates for printing from selected areas of printing surfaces
- 47/54 • • with means for automatically reciprocating printing plate transversely to enable addresses to be printed in columns side by side
- 47/56 • Indicating, warning, control or safety devices (B41L 47/58 takes precedence)
- 47/58 • Arrangements or devices for selecting, or for facilitating selection of, text or image to be printed
- 47/60 • • Markings applied to printing plates, e.g. code marks, colours, clips, perforations, edge notches, projections
- 47/62 • • Selecting devices, e.g. cams, windows, position indicators
- 47/64 • • • Automatic selecting devices with or without overriding manual control, e.g. with scanning-fingers, with presetting controls operable by push-buttons, with programme control by punched tapes

##### **49/00 Accessories or attachments for addressing machines or like series-printing machines**

- 49/02 • Counting, numbering, or dating devices
- 49/04 • Devices for applying selection markings to printing plates

#### **B41M PRINTING, DUPLICATING, MARKING, OR COPYING PROCESSES; COLOUR PRINTING** (correction of typographical errors B41J; processes for applying transfer pictures or the like B44C 1/16; fluid media for correction of typographical errors by coating C09D 10/00; printing textiles D06P)

##### **1/00 Inking and printing with a printer's forme**

- 1/02 • Letterpress printing, e.g. book printing
- 1/04 • • Flexographic printing
- 1/06 • Lithographic printing
- 1/08 • • Dry printing
- 1/10 • Intaglio printing
- 1/12 • Stencil printing; Silk-screen printing
- 1/14 • Multicolour printing
- 1/16 • • using different inks which flow into one another to produce iridescent effects
- 1/18 • • Printing one ink over another

- 1/20 • • by applying differently-coloured inks simultaneously to different parts of the printing surface
- 1/22 • Metallic printing; Printing with powdered inks
- 1/24 • combined with embossing (printing machines for carrying out printing operations combined with embossing B41F 19/02) [2]
- 1/26 • Printing on other surfaces than ordinary paper (B41M 1/40 takes precedence)
- 1/28 • • on metals
- 1/30 • • on organic plastics, horn, or like materials
- 1/32 • • on rubber
- 1/34 • • on glass or ceramic surfaces

- 1/36 • • on pretreated paper, e.g. on parchment, oiled paper, paper for registration purposes
- 1/38 • • on wooden surfaces, leather, or linoleum (printing on matches or match boxes when combined with match manufacture C06F 1/18)
- 1/40 • Printing on bodies of particular shapes
- 1/42 • Printing without contact between forme and surface to be printed, e.g. by using electrostatic fields [2]
- 3/00 Printing processes to produce particular kinds of printed work, e.g. patterns** (special designs or pictures *per se* B44F; manufacturing printed circuits using printing techniques H05K 3/12) [5]
  - 3/02 • Maps; Sea or meteorological charts
  - 3/04 • Music
  - 3/06 • Veined printings; Fluorescent printings; Stereoscopic images; Imitated patterns, e.g. tissues, textiles [5]
  - 3/10 • Watermarks
  - 3/12 • Transfer pictures or the like, e.g. decalcomanias
  - 3/14 • Security printing
  - 3/16 • Braille printing (typewriters or selective printing mechanisms for Braille printing B41J 3/32) [2]
  - 3/18 • Particular kinds of wallpapers
- 5/00 Duplicating or marking methods; Sheet materials for use therein** (by using light-sensitive materials G03; electrography, magnetography G03G)
  - 5/025 • by transferring ink from the master sheet [4]
  - 5/03 • • by pressure [4]
  - 5/035 • • by sublimation or volatilisation of design [4]
  - 5/04 • • using solvent-soluble dyestuffs on the master sheet, e.g. alcohol-soluble [5]
  - 5/06 • • using master sheets coated with jelly-like materials, e.g. gelatin
  - 5/08 • • • Sheet materials therefor
  - 5/10 • by using carbon paper or the like
  - 5/124 • using pressure to make a masked colour visible, e.g. to make a coloured support visible, to create an opaque or transparent pattern, or to form colour by uniting colour-forming components [5]
  - 5/128 • • Desensitisers; Compositions for fault correction, detection or identification of the layers [5]
  - 5/132 • • Chemical colour-forming components; Additives or binders therefor [5]
  - 5/136 • • • Organic colour formers, e.g. leuco dyes [5]
  - 5/145 • • • • with a lactone or lactam ring [5]
  - 5/15 • • • Spiro-pyrans [5]
  - 5/155 • • • Colour-developing components, e.g. acidic compounds; Additives or binders therefor; Layers containing such colour-developing components, additives or binders [5]
  - 5/165 • • characterised by the use of microcapsules; Special solvents for incorporating the ingredients [5]
  - 5/20 • using electric current (B41M 5/24 takes precedence) [5]
  - 5/24 • Ablative recording, e.g. by burning marks; Spark recording [5]
  - 5/26 • Thermography (B41M 5/20, B41M 5/24 take precedence; photothermographic systems G03C 1/498) [5]
  - 5/28 • • using thermo-chromic compounds or layers containing liquid crystals, microcapsules, bleachable dyes or heat decomposable compounds, e.g. gas liberating [5]
  - 5/30 • • using chemical colour formers (B41M 5/34 takes precedence) [5]
  - 5/32 • • • one component thereof being a heavy metal compound [5]
  - 5/323 • • • Organic colour formers, e.g. leuco dyes [2006.01]
  - 5/327 • • • • with a lactone or lactam ring [2006.01]
  - 5/333 • • • Colour developing components therefor, e.g. acidic compounds [2006.01]
  - 5/337 • • • Additives; Binders [2006.01]
  - 5/34 • • Multicolour thermography [5]
  - 5/36 • • using a polymeric layer, which may be particulate and which is deformed or structurally changed with modification of its properties, e.g. of its optical, hydrophobic-hydrophilic, solubility or permeability properties [5]
  - 5/382 • • Contact transfer or sublimation processes (sublistatic printing B41M 5/035; ink-, dye- or pigment-receptive coatings B41M 5/50) [2006.01]
  - 5/385 • • • characterised by the transferable dyes or pigments [2006.01]
  - 5/388 • • • • Azo dyes [2006.01]
  - 5/39 • • • • Dyes containing one or more carbon-to-nitrogen double bonds, e.g. azomethine [2006.01]
  - 5/392 • • • Additives other than colour forming substances, dyes or pigments, e.g. sensitisers, transfer promoting agents [2006.01]
  - 5/395 • • • • Macromolecular additives, e.g. binders [2006.01]
  - 5/398 • • Processes based on the production of stickiness patterns using powders [2006.01]
  - 5/40 • • characterised by the base, intermediate or covering layers; Heat, radiation filtering or absorbing means or layers; combined with layers or compositions suitable for other methods of image registration; Special originals for reproduction by thermography [5]
  - 5/41 • • • Base layers [2006.01]
  - 5/42 • • • Intermediate or covering layers [2006.01]
  - 5/44 • • • • characterised by the macromolecular compounds [2006.01]
  - 5/46 • • • characterised by the light-to-heat converting means; characterised by the heat or radiation filtering or absorbing means or layers [2006.01]
  - 5/48 • • • combined with other image registration layers or compositions; Special originals for reproduction by thermography [2006.01]
  - 5/50 • Recording sheets characterised by the coating used to improve ink, dye or pigment receptivity, e.g. for ink-jet or thermal dye transfer recording (printing on pretreated paper B41M 1/36) [2006.01]
  - 5/52 • • Macromolecular coatings [2006.01]
  - 7/00 After-treatment of printed works, e.g. heating, irradiating**
    - 7/02 • Dusting; Varnishing (devices for treating the surfaces of sheets, webs, or other articles in connection with printing B41F 23/00, B41L 23/00)
  - 9/00 Processes wherein make-ready devices are used** (make-ready devices *per se* B41N 6/00) [5]
    - 9/02 • Relief make-readies
    - 9/04 • photomechanical
  - 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B41N PRINTING PLATES OR FOILS** (photosensitive materials G03); **MATERIALS FOR SURFACES USED IN PRINTING MACHINES FOR PRINTING, INKING, DAMPING, OR THE LIKE; PREPARING SUCH SURFACES FOR USE OR CONSERVING THEM**

**1/00 Printing plates or foils; Materials therefor**

- 1/02 • made of stone
- 1/04 • metallic
- 1/06 • • for relief printing or intaglio printing
- 1/08 • • for lithographic printing
- 1/10 • • • multiple
- 1/12 • non-metallic other than stone
- 1/14 • • Lithographic printing foils
- 1/16 • Curved printing plates, especially cylinders
- 1/18 • • made of stone
- 1/20 • • made of metal
- 1/22 • • made of other substances
- 1/24 • Stencils; Stencil materials; Carriers therefor (stencilling apparatus for office or other commercial use B41L 13/00)

**3/00 Preparing for use or conserving printing surfaces**

- 3/03 • Chemical or electrical pretreatment [5]
- 3/04 • Graining or abrasion by mechanical means (chemical graining B41N 3/03) [5]
- 3/06 • by use of detergents
- 3/08 • Damping; Neutralising or similar differentiation treatments of lithographic printing formes [5]

**6/00 Mounting boards; Make-ready devices, e.g. underlays, overlays; Attaching by chemical means, e.g. vulcanising [5]**

- 6/02 • Chemical means for fastening printing formes on mounting boards [5]

**7/00 Shells for rollers of printing machines**

- 7/02 • of leather
- 7/04 • for damping rollers
- 7/06 • for inking rollers [5]

**10/00 Blankets or like coverings; Coverings for wipers for intaglio printing** (wipers for intaglio printing B41F 9/08) [5]

- 10/02 • Blanket structure [5]
- 10/04 • • multi-layer [5]
- 10/06 • • facilitating fastening to, or location on, supports [5]

**11/00 Stereotype mats**

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B42 BOOKBINDING; ALBUMS; FILES; SPECIAL PRINTED MATTER**

**B42B PERMANENTLY ATTACHING TOGETHER SHEETS, QUIRES, OR SIGNATURES, OR PERMANENTLY ATTACHING OBJECTS THERETO** (nailing or stapling in general B25C, B27F; machines for both collating or gathering and permanently attaching together sheets or signatures B42C 1/12; temporarily attaching sheets together B42F)

**2/00 Permanently attaching together sheets, quires, or signatures by stitching with filamentary material, e.g. textile threads** (discontinuously B42B 4/00) [2]

- 2/02 • Machines for stitching with thread [2]
- 2/04 • • with straight needles [2]
- 2/06 • • with curved needles [2]
- 2/08 • • with devices for forming safety knots or with tying mechanisms [2]
- 2/10 • Hand-stitching tools [2]

**4/00 Permanently attaching together sheets, quires or signatures by discontinuous stitching with filamentary material, e.g. wire [2]**

- 4/02 • Rotary-type stitching machines [2]

**5/00 Permanently attaching together sheets, quires, or signatures otherwise than by stitching** (by deformation thereof B31F; by adhesive peculiar to bookbinding B42C 9/00)

- 5/02 • by eyelets (for garments A41H 37/02; for shoes A43D 100/00)

- 5/04 • by laces or ribbons

- 5/06 • by clips

- 5/08 • by finger, claw, or ring-like elements passing through the sheets, quires, or signatures

- 5/10 • • the elements being of castellated or comb-like form

- 5/12 • • the elements being coils

**7/00 Permanently attaching objects, e.g. map sections, to sheets**

**9/00 Devices common to machines for carrying out the processes according to more than one of main groups B42B 2/00-B42B 7/00** (auxiliary equipment in making paper articles B31F; auxiliary equipment in printing machines B41; conveyers in general B65G)

- 9/02 • for opening quires or signatures

- 9/04 • for conveying downwardly-open signatures

- 9/06 • for pasting (applying glue or adhesive peculiar to bookbinding B42C 9/00) [2]

**B42C BOOKBINDING** (cutting or perforating machines, devices, or tools B26; folding sheets or webs B31F; ornamenting books B44)

**Subclass index**

## B42C

### OPERATION

Collating or gathering; preparing edges or backs; manufacturing cases or covers.....	1/00, 5/00, 7/00
Permanently attaching; casing-in.....	1/00, 9/00, 11/00
Jacketing.....	15/00
Rebinding.....	17/00
Other operations.....	3/00, 7/00
COMBINED OPERATIONS.....	1/00, 19/00
EQUIPMENT.....	13/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

**1/00 Collating or gathering sheets combined with processes permanently attaching together sheets or signatures or for interposing inserts** (collating or gathering sheets or signatures without permanently attaching them together B65H 39/00) [2]

1/10 • Machines for both collating or gathering and interposing inserts

1/12 • Machines for both collating or gathering and permanently attaching together the sheets or signatures

**3/00 Making booklets, pads, or form sets from multiple webs**

**5/00 Preparing the edges or backs of leaves or signatures for binding**

5/02 • by rounding or backing

5/04 • by notching or roughening

5/06 • by fanning

**7/00 Manufacturing bookbinding cases or covers of loose-leaf binders** (book covers B42D 3/00)

**9/00 Applying glue or adhesive peculiar to bookbinding**

9/02 • for securing back linings, strips, ribbons, or headbands

**11/00 Casing-in**

11/02 • Machines or equipment for casing-in or applying covers to pamphlets, magazines, pads, or other paper-covered booklets (B42C 11/06 takes precedence)

11/04 • Machines or equipment for casing-in or applying covers to books (B42C 11/06 takes precedence)

11/06 • Machines or equipment for casing-in by welding plastic materials

**13/00 Bookbinding presses** (general features of presses B30B); **Joint-creasing equipment for bookbinding; Drying or setting devices for books**

**15/00 Jacketing books**

**17/00 Rebinding books**

**19/00 Multi-step processes for making books**

19/02 • starting with single sheets

19/04 • starting with signatures

19/06 • starting with webs not provided for elsewhere

19/08 • Conveying between operating stations in machines (conveyers in general B65G)

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B42D BOOKS; BOOK COVERS; LOOSE LEAVES; PRINTED MATTER OF SPECIAL FORMAT OR STYLE NOT OTHERWISE PROVIDED FOR; DEVICES FOR USE THEREWITH; MOVABLE-STRIP WRITING OR READING APPARATUS** (book stands A47B; reading desks A47B 19/00; book rests A47B 23/00)

### Subclass index

BOOKS; PADS OR BLOCKS; NEWSPAPERS.....	1/00, 5/00, 7/00
BOOK-KEEPING BOOKS.....	12/00
LOOSE LEAVES FOR BINDING, SPECIAL PRINTED MATTER.....	13/00, 15/00
BOOK COVERS.....	3/00
MOVABLE-STRIP APPARATUS.....	19/00
ACCESSORIES.....	9/00, 11/00, 17/00

**1/00 Books or other bound products** (match books A24F 27/12; picture books with additional toy effects A63H 33/38; indexing features B42F 21/00; educational or demonstration appliances G09B, e.g. textbooks for teaching foreign languages G09B 19/08)

1/02 • in which the fillings and covers are connected by end papers

1/04 • in which the fillings and the spine portions of the covers are secured integrally, e.g. paper-backs (in French "livres broches", in German "Broschüren")

1/06 • in which the fillings and covers are united by other means

1/08 • Albums (filing features thereof B42F)

1/10 • Files with adhesive strips for mounting papers

**3/00 Book covers** (loose-leaf binders B42F)

3/02 • made of special materials

3/04 • loose

3/06 • with hinges

3/08 • Ornamented covers

3/10 • with locks or closures

3/12 • combined with other articles

3/14 • • with column markers or line or heading indicators

3/16 • • with means for holding books open

3/18 • Other accessories

5/00	<b>Sheets united without binding to form pads or blocks</b> (processes therefor B42B)	15/10	• Identity, credit, cheque or like information-bearing cards (recognition of data, cards used as record carriers G06K; record carriers in general G11) [5]
5/02	• Form sets (book-keeping forms B42D 12/02)		
5/04	• Calendar blocks (special apparatus for printing calendars B41F 17/04)		
5/06	• • Tear-off calendar blocks		
7/00	<b>Newspapers or the like</b>	17/00	<b>Hanging or securing devices for books, newspapers, or the like</b> (suspended filing appliances B42F 15/00) [2]
9/00	<b>Bookmarkers; Spot indicators; Devices for holding books open</b> (combined with covers B42D 3/16; indexing tabs for sheets B42F 21/00); <b>Leaf turners</b> [2]	19/00	<b>Movable-strip writing or reading apparatus</b> (manifolding apparatus B41L; adapted for, or incorporated in, cash registers G07G)
9/02	• Automatic bookmarkers		
9/04	• Leaf turners		
9/06	• • having an arm reset after each operation		
9/08	• • having radial arms, one per leaf, operated successively		
11/00	<b>Carrying forward or transferring entries from one page to another, e.g. for book-keeping</b>		
12/00	<b>Book-keeping books, forms, or arrangements</b> (B42D 11/00 takes precedence) [2]	101/00	<b>Card or region thereof being transparent</b> [5]
12/02	• Book-keeping forms [2]	103/00	<b>Card or region thereof being translucent</b> [5]
13/00	<b>Loose leaves modified for binding; Inserts</b> (loose leaves modified for temporary attachment B42F 3/00; indexing features B42F 21/00)	105/00	<b>with metallic material</b> [5]
15/00	<b>Printed matter of special format or style not otherwise provided for</b> (sheets temporarily attached together or with objects so attached thereto B42F; maps, diagrams G09B 29/00; labels G09F 3/00)	107/00	<b>with magnetic or magnetisable material</b> [5]
15/02	• Postcards; Greeting, menu, business or like cards; Letter cards or letter-sheets (B42D 15/10 takes precedence; envelopes B65D 27/00)	109/00	<b>incorporating electrical circuitry</b> [5]
15/04	• • Foldable or multi-part cards or sheets	109/02	• with liquid-crystal display [5]
15/08	• • • Letter-cards or letter-sheets, i.e. cards or sheets each of which is to be folded with the message inside and to serve as its own envelope for mailing [3]	111/00	<b>made of paper or cardboard</b> [5]
		113/00	<b>of single layer structure</b> [5]
		115/00	<b>having foldable or removable parts</b> [5]
		117/00	<b>having mating or co-operating parts</b> [5]
		119/00	<b>with pressure-sensitive material</b> [5]
		121/00	<b>having projections or recesses, e.g. for co-operation with machine elements</b> [5]
B42F	<b>SHEETS TEMPORARILY ATTACHED TOGETHER; FILING APPLIANCES; FILE CARDS; INDEXING</b> (reading desks A47B 19/00; book rests A47B 23/00)		

**Note(s)**

In this subclass, the following expression is used with the meaning indicated:

- "filing appliance" means holders for collections of papers, sheets, cards, or units thereof, each paper, sheet, card, or unit being individually insertable and extractable. This expression may thus include a calendar, an instruction manual, or a letter file.

**Subclass index**

SHEETS ATTACHED TOGETHER: WITHOUT PERFORATING; USING PERFORATIONS; TO OBJECTS.....	1/00, 3/00, 5/00
FILING APPLIANCES	
Without fastening means.....	7/00
With fastening means: with clamping action; with separate holding means; using perforations.....	9/00, 11/00, 13/00
Suspended.....	15/00
Special for cards; file cards.....	17/00, 19/00
Other filing appliances.....	23/00
INDEXING MEANS.....	21/00

**Sheets temporarily attached together; Means therefor; Albums**

- 1/00 Sheets temporarily attached together without perforating; Means therefor**
- 1/02 • Paper-clips or like fasteners (B42F 1/12 takes precedence)
- 1/04 • • metallic
- 1/06 • • • of flat cross-section
- 1/08 • • • of round cross-section
- 1/10 • • non-metallic
- 1/12 • Means for attaching together sheet corners exclusively
- 3/00 Sheets temporarily attached together involving perforations; Means therefor; Sheet details therefor** (staples, fasteners in general F16B)
- 3/02 • Attachment means of bifurcated form
- 3/04 • Attachment means of ring, finger, or claw form (ring files B42F 13/16; using such means for permanent attachment B42B 5/08) [2]
- 3/06 • Attachment means of coiled form
- 5/00 Sheets and objects temporarily attached together; Means therefor; Albums** (bookbinding aspects of albums B42D 1/08; advertising or display aspects G09)
- 5/02 • Stamp or like filing arrangements in albums
- 5/04 • • with transparent pockets
- 5/06 • Corner-holding devices, e.g. for photographs

**Filing appliances**

- 7/00 Filing appliances without fastening means** (B42F 17/00 takes precedence; suspension files B42F 15/00; wallets, notecases, briefcases A45C, e.g. A45C 1/00; furniture features A47B, A47F; envelopes B65D, e.g. B65D 27/00)
- 7/02 • Single gusseted pockets
- 7/04 • Covers with retention means
- 7/06 • Portfolios or cases with a plurality of compartments (indexing features B42F 21/00)
- 7/08 • • expandable
- 7/10 • Trays
- 7/12 • • Stacked trays
- 7/14 • Boxes (box features in general B65D)
- 9/00 Filing appliances with devices clamping file edges; Covers with clamping backs** (B42F 13/00, B42F 17/00 take precedence)
- 11/00 Filing appliances with separate intermediate holding means** (B42F 17/00 takes precedence; with adhesive strips for mounting papers or sheets B42D 1/10)
- 11/02 • engaging folds (B42F 11/04 takes precedence)
- 11/04 • magnetic
- 13/00 Filing appliances with means for engaging perforations or slots** (B42F 17/00 takes precedence; indexing features B42F 21/00)
- 13/02 • with flexible or resilient means
- 13/04 • • with cords, coils, or chains
- 13/06 • • with strips or bands
- 13/08 • • • of metal
- 13/10 • • • of plastics
- 13/12 • with pillars, posts, rods, or tubes (B42F 13/30 takes precedence)
- 13/14 • • with clamping or locking means (pressure bars B42F 13/36)

- 13/16 • with claws or rings (B42F 13/30 takes precedence; for permanent binding B42B 5/08)
- 13/18 • • on two bars relatively movable longitudinally
- 13/20 • • pivotable about an axis or axes parallel to binding edges
- 13/22 • • • in two sections engaging each other when closed
- 13/24 • • • • wherein one section is in the form of fixed rods
- 13/26 • • • • and locked when so engaged, e.g. snap action
- 13/28 • • • in two staggered sections
- 13/30 • having a set of rods within a set of tubes for a substantial distance when closed
- 13/32 • • the nesting portions of the rods and tubes being straight
- 13/34 • • • with the rods locking in the tubes
- 13/36 • Locking followers; Pressure bars
- 13/38 • Expandable cover splines
- 13/40 • combined or formed with other articles, e.g. punches, stands
- 13/42 • Content-transfer devices; Converting into permanent binders
- 15/00 Suspended filing appliances** (indexing features B42F 21/00; hanging of books, newspapers, or the like B42D 17/00)
- 15/02 • in concertina form
- 15/04 • Backs or the like therefor
- 15/06 • for hanging large drawings or the like
- 17/00 Card-filing arrangements, e.g. card indexes or catalogues or filing cabinets** (indexing features B42F 21/00; furniture features A47B, A47F)
- 17/02 • in which the cards are stored substantially at right angles to the bottom of their containers
- 17/04 • • the cards being staggered sideways (with means for staggering cards already in the file B42F 17/32) [2]
- 17/06 • • with separable or loose card-separating means
- 17/08 • • Construction of the containers, e.g. trays or drawers
- 17/10 • • • Hinged walls
- 17/12 • • • Dividing means
- 17/14 • • • Locking followers
- 17/16 • • • with card-retaining means
- 17/18 • in which the cards are stored in a flat position
- 17/20 • • and are pivotable relative to the bottom of their containers
- 17/22 • • • Connections between the cards and their containers
- 17/24 • • • Special adaptations for use of index strips
- 17/26 • • • Stands for the containers
- 17/28 • in the form of endless bands or revolving drums
- 17/30 • modified for particular uses
- 17/32 • with means for staggering cards already in the file [2]
- 17/34 • with card-selection means, e.g. telephone-number list finders (selecting devices for data cards G06K 21/00)
- 19/00 File cards** (B42F 21/00 takes precedence; punched cards for information retrieval, e.g. for manual use, G06K 21/00)
- 19/02 • folded
- 19/04 • with receptacles or other holding devices
- 21/00 Indexing means; Indexing tabs or protectors therefor**



21/02	• Tabs integral with sheets, papers, cards, or suspension files	21/10	• • • represented by slits
21/04	• Tabs permanently fastened to sheets, papers, cards, or suspension files	21/12	• Sheets, papers, or cards having edges cut away to facilitate indexing, e.g. thumb cuts on books
21/06	• Tabs detachably mounted on sheets, papers, cards, or suspension files		
21/08	• • in one of a number of predetermined positions	23/00	<b>Filing appliances not provided for in other groups of this subclass [2006.01]</b>

## B43 WRITING OR DRAWING IMPLEMENTS; BUREAU ACCESSORIES

**B43K IMPLEMENTS FOR WRITING OR DRAWING** (containers, casings or accessories for cosmetic substances, e.g. shaving soap, lipstick, make-up, A45D 34/00, A45D 40/00)

### Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "writing implements" covers pens, pencils, crayons, chalks or like markers for writing or drawing.

### Subclass index

#### IMPLEMENTS WITH CORES

Without mechanisms.....	19/00
With mechanisms.....	21/00
Accessories.....	23/00, 25/00

#### IMPLEMENTS USING INK

Without reservoir.....	3/00
With reservoir.....	5/00, 7/00, 8/00
Nibs; filling devices; caps.....	1/00, 17/00, 11/00, 23/00
Manufacture, maintenance.....	13/00, 15/00

#### SELECTING, PROJECTING, RETRACTING OR LOCKING WRITING UNITS.....24/00

#### MULTIPLE-POINT WRITING IMPLEMENTS.....27/00

#### COMBINATIONS

Of writing implements with other articles.....	29/00, 31/00
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<b>1/00 Nibs</b> (continuously-adjustable nibs B43K 17/00); <b>Writing-points</b> (for indicating or recording apparatus G01D 15/16) [2]	5/10 • • with reserve ink chambers
1/01 • with ink reservoirs, e.g. funnel-shaped [6]	5/12 • • with ink-level inspection means
1/02 • Split nibs	5/14 • • Exchangeable ink cartridges
1/04 • • with broadened tips	5/16 • with retractable nibs (mechanisms for retracting or locking nibs B43K 24/00)
1/06 • Tubular writing-points	5/17 • • with closing means [6]
1/08 • with ball points; Balls or ball beds	5/18 • Arrangements for feeding the ink to the nibs
1/10 • Wire nibs	<b>7/00 Ball-point pens</b> (multiple-point writing implements B43K 27/00)
1/12 • Writing-points comprising fibres; Felt pads	7/01 • for low viscosity liquid ink [6]
<b>3/00 Nib holders</b> (holders for continuously-adjustable nibs B43K 17/00)	7/02 • Ink reservoirs; Ink cartridges (B43K 7/01 takes precedence) [6]
3/02 • with ink guards	7/03 • • pressurised, e.g. by gas [5]
3/04 • with retractable nibs (mechanisms for retracting or locking nibs B43K 24/00)	7/035 • • • the gas acting on a piston [6]
<b>5/00 Pens with ink reservoirs in holders, e.g. fountain-pens</b> (nibs or writing-points with ink reservoirs B43K 1/01; ball-point pens B43K 7/00; pens with writing-points other than nibs or balls B43K 8/00; multiple-point writing implements B43K 27/00)	7/04 • • Arrangements for refilling the reservoirs, e.g. arrangements at the ball-point ends
5/02 • Ink reservoirs	7/06 • • Reservoirs with ink-level inspection means
5/03 • • specially adapted for concentrated ink, e.g. solid ink [6]	7/08 • • Preventing leakage
5/04 • • flexible	7/10 • Arrangements for feeding the ink to the ball points (B43K 7/01 takes precedence) [6]
5/06 • • with movable pistons	7/12 • with retractable ball points (mechanisms for retracting or locking ball points B43K 24/00)
5/08 • • • with ink-supplying valves	<b>8/00 Pens with writing-points other than nibs or balls</b> (brushes with reservoir for supplying substances A46B 11/00)

- 8/02 • with writing-points comprising fibres, felt, or similar porous or capillary material (B43K 8/22 takes precedence) [2, 5]
- 8/03 • • Ink reservoirs; Ink cartridges [6]
- 8/04 • • Arrangements for feeding ink to writing-points [5]
- 8/06 • • • Wick feed from within reservoir to writing-points [5]
- 8/08 • • • • Wick separate from writing-points [5]
- 8/10 • • • including compartment for soluble solid material [5]
- 8/12 • • • writing-points or writing-point units being separable from reservoir [5]
- 8/14 • with coreless tubular writing-points [5]
- 8/16 • with tubular writing-points comprising a movable cleaning element [5]
- 8/18 • • Arrangements for feeding the ink to the writing-points [5]
- 8/20 • with roller writing-points [5]
- 8/22 • with electrically or magnetically activated writing-points [5]
- 8/24 • characterised by the means for retracting writing-points [5]
- 11/00 Filling devices** (ink receptacles B43L 25/00)
- 13/00 Devices for removing nibs; Devices for cleaning nibs, e.g. by wiping** (ink receptacles with pen-wiping means B43L 25/12) [3]
- 13/02 • for cleaning nibs, e.g. ink reservoirs therein [6]
- 15/00 Assembling, finishing, or repairing pens**
- 15/02 • Automatic machines
- 17/00 Continuously-adjustable nibs, e.g. for drawing-pens; Holders therefor** (features common to fountain-pens B43K 5/00)
- 17/01 • Nibs with ink reservoirs [6]
- 17/02 • Nibs having more than two legs
- 17/04 • Holders with arrangements for drawing dotted lines
- 19/00 Non-propelling pencils; Styles; Crayons; Chalks** (batik pencils, cord line chalkers B44D 3/00; writing-core compositions for pencils, crayon compositions, chalk compositions C09D 13/00) [2]
- 19/02 • Pencils with graphite; Coloured pencils
- 19/04 • Pencils with metallic writing-core
- 19/06 • • the writing-core being made from substance wearing off during use
- 19/08 • • the writing-core being made from wear-resistant substances
- 19/10 • • • equipped with ball point (using ink B43K 1/08, B43K 7/00)
- 19/12 • Slate pencils
- 19/14 • Sheathings
- 19/16 • Making non-propelling pencils (making slate-pencil writing-cores B28D)
- 19/18 • • Making pencil writing-cores
- 21/00 Propelling pencils** (projecting mechanisms for writing units B43K 24/00; multiple-point writing implements B43K 27/00)
- 21/02 • Writing-core feeding mechanisms
- 21/027 • • with sliding tube-like writing-core guide [5]
- 21/033 • • • with automatic feed by pressure during use of pencil [5]
- 21/04 • • with the writing-cores brought into position by gravity
- 21/06 • • with the writing-cores fed by means sliding in longitudinally-slotted casings
- 21/08 • • with the writing-cores fed by screws
- 21/10 • • • with separate writing-core remnants ejecting-bar
- 21/12 • • • with means preventing overwinding
- 21/14 • • • with writing-cores automatically replaced from magazines
- 21/16 • • with stepwise feed of writing-cores
- 21/18 • • • having ratchet means
- 21/20 • • • with writing-cores automatically replaced from magazines
- 21/22 • • Writing-cores gripping means, e.g. chucks
- 21/24 • Assembling, finishing, or repairing propelling pencils (making pencil writing-cores B43K 19/18)
- 21/26 • • Automatic machines
- 23/00 Holders or connectors for writing implements; Means for protecting the writing-points**
- 23/004 • Holders specially adapted for assisting handicapped or disabled persons to write (B43L 15/00 takes precedence) [6]
- 23/008 • Holders comprising finger grips (B43K 23/004, B43K 23/012 take precedence) [6]
- 23/012 • Holders for attachment to finger tips (B43K 23/004 takes precedence) [6]
- 23/016 • Holders for crayons or chalks (B43K 23/004-B43K 23/012, B43K 23/02 take precedence) [6]
- 23/02 • with means for preventing rolling (B43K 23/004-B43K 23/012 take precedence) [6]
- 23/04 • • enabling the writing implement to be set upright
- 23/06 • Means for connecting two or more writing implements [6]
- 23/08 • Protecting means, e.g. caps [6]
- 23/10 • • for pencils [6]
- 23/12 • • for pens [6]
- 24/00 Mechanisms for selecting, projecting, retracting or locking writing units [6]**
- 24/02 • for locking a single writing unit in only fully projected or retracted positions
- 24/03 • • operated by flicking or tilting [6]
- 24/04 • • operated by means sliding in longitudinally-slotted casings
- 24/06 • • operated by turning means
- 24/08 • • operated by push-buttons
- 24/10 • for selecting, projecting and locking several writing units
- 24/12 • • operated by means sliding in longitudinally-slotted casings
- 24/14 • • operated by turning means
- 24/16 • • operated by push-buttons
- 24/18 • • and for feeding the writing cores
- 25/00 Attaching writing implements to wearing apparel or objects involving constructional changes of the implements** (protecting means, e.g. caps, B43K 23/08; fastening articles to wearing apparel A45F 5/02)
- 25/02 • Clips [6]
- 27/00 Multiple-point writing implements, e.g. multicolour; Combinations of writing implements** (B43K 29/00 takes precedence; mechanisms for selecting, projecting, retracting or locking writing units B43K 24/00; multiple writing devices with pantographic linkages B43L 13/12)
- 27/02 • Combinations of pens and pencils

- 27/04 • Combinations of pencils (writing-core feed mechanisms B43K 21/02)
- 27/08 • Combinations of pens
- 27/12 • • of ball-point pens [3]
- 29/00 Combinations of writing implements with other articles**
- 29/007 • with advertising means [6]
- 29/013 • with stamping means [6]
- 29/02 • with rubbers
- 29/04 • with blotters
- 29/05 • with applicators for eradicating- or correcting-liquid [6]
- 29/06 • with sharpening devices (with erasing knives B43K 29/18; pocket knives with pencils B26B)
- 29/08 • with measuring, computing or indicating devices

- 29/087 • • for indicating time, e.g. with calendars or watches [6]
- 29/093 • • with calculators [6]
- 29/10 • with illuminating devices
- 29/12 • with memorandum appliances (with book covers B42D)
- 29/16 • with lighters
- 29/18 • with hand tools, e.g. erasing knives (with pocket knives B26B)
- 29/20 • with other articles having storage compartments (with lighters B43K 29/16; writing implements functioning as, or combined with, writing implement receptacles B43K 31/00)
- 31/00 Writing implement receptacles functioning as, or combined with, writing implements** (other writing implement receptacles A45C 11/34, A45C 11/36)

**B43L ARTICLES FOR WRITING OR DRAWING UPON; ACCESSORIES FOR WRITING OR DRAWING** (workshop equipment for marking-out work B25H 7/00; teaching hand-writing or drawing G09B 11/00)

### Note(s)

This subclass does not cover devices used for both teaching and facilitating writing or drawing, which are covered by group G09B 11/00.

### Subclass index

#### ARTICLES FOR WRITING OR DRAWING UPON

Boards or tablets.....	1/00
Underlays.....	3/00
Drawing-boards.....	5/00

#### AIDS FOR DRAWING

Straight lines.....	7/00
Circles.....	9/00
Other curves.....	11/00
Means to prevent slippage.....	12/00
Other figures.....	13/00

#### ATTACHMENT TO HANDS OR ARMS.....15/00

#### BLOTTERS.....17/00

#### ACCESSORIES FOR

Rubbing or erasing.....	19/00
Cleaning blackboards or slates.....	21/00
Sharpening pencils or leads.....	23/00

#### INK RECEPTACLES; INK STANDS.....25/00, 27/00

### Articles for writing or drawing upon

- 1/00 Repeatedly-usable boards or tablets for writing or drawing** (drawing-boards B43L 5/00)
- 1/02 • Slates
- 1/04 • Blackboards (easels or stands for blackboards A47B 97/04)
- 1/06 • • rigid
- 1/08 • • flexible
- 1/10 • • Writing surfaces thereof
- 1/12 • having translucent writing surfaces producing visual impressions by co-operation with backing members
- 3/00 Writing or drawing-underlays, e.g. blotting pads** (blotters B43L 17/00)
- 5/00 Drawing-boards** (drawing-desks or tables A47B 27/00, A47B 85/02; stands for drawing-boards A47B 97/04)

- 5/02 • having means for clamping sheets of paper thereto (drawing-pins B43M 15/00)

### Writing or drawing aids

- 7/00 Straightedges** (guides for rulers other than for T-squares B43L 13/04; curve rulers or templates B43L 13/20; straightedges characterised by the provision of indicia or the like for measuring, e.g. rulers or tapes with measuring scales or marks for direct reading, G01B)

### Note(s)

In this group, the following term is used with the meaning indicated:

- "straightedge" means an instrument or its edge serving the purpose of acting as a guide for the drawing of a straight line.

- 7/02 • T-squares

## B43L

- 7/027 • Plural non-adjustable straightedges fixed at right angles (B43L 7/02 takes precedence) [5]
- 7/033 • Plural non-adjustable straightedges forming non-right angles [5]
- 7/04 • with rollers (with interconnected rollers B43L 13/02)
- 7/08 • with arrangements for attaching additional drawing equipment, e.g. for hatching, dotting
- 7/10 • Plural straightedges relatively movable [5]
- 7/12 • • Square and pivoting straightedges [5]
- 7/14 • • Square and sliding straightedges [5]

### 9/00 Circular curve-drawing or like instruments (curve rulers or templates B43L 13/20)

- 9/02 • Compasses (proportional compasses B43L 9/08; compasses for drawing spirals B43L 11/06)
- 9/04 • • Beam compasses
- 9/06 • • with legs formed by flat springs
- 9/08 • Proportional compasses or dividers
- 9/10 • • with arrangements for drawing polygons
- 9/12 • Dividers (proportional dividers B43L 9/08)
- 9/14 • with changeable leg-ends for conversion into compasses, dividers, or callipers (B43L 9/24 takes precedence)
- 9/16 • Features common to compasses, dividers, or callipers
- 9/18 • • Legs with toggle joints
- 9/20 • • Pivots
- 9/22 • • Leg-angle adjusting-means separate from pivots
- 9/24 • • Means for mounting points or writing appliances on legs

### 11/00 Non-circular-curve-drawing instruments (curve rulers or templates B43L 13/20)

- 11/02 • for drawing conic sections
- 11/04 • • for drawing ellipses
- 11/045 • • • with cords or like flexible elements [5]
- 11/05 • • • with gears [5]
- 11/055 • • • with guides [5]
- 11/06 • for drawing spirals
- 11/08 • for drawing involutes

### 12/00 Means to prevent slippage [5]

- 12/02 • magnetic [5]

### 13/00 Drawing instruments, or writing or drawing appliances or accessories, not otherwise provided for (stencils for surface decoration B44D)

- 13/02 • Drafting machines or drawing devices for keeping parallelism (T-squares B43L 7/02)
- 13/04 • • Guides for rulers
- 13/06 • • • with pivoted guide rods
- 13/08 • • Protractor heads
- 13/10 • Pantographic instruments for copying, enlarging, or diminishing (arrangements for copying in machine tools B23Q)

- 13/12 • • Multiple writing devices
- 13/14 • Devices for drawing in perspective
- 13/16 • • free-hand
- 13/18 • • • having optical or projecting equipment (optical systems or apparatus G02B; projectors G03B)
- 13/20 • Curve rulers or templates
- 13/22 • • Adjustable curve rulers
- 13/24 • Devices for generating stepwise movements of drawing equipment, e.g. for hatching

### 15/00 Supports for attachment to hands or arms for facilitating writing or drawing

### 17/00 Blotters (blotting pads B43L 3/00; combined with writing implements B43K 29/04; making blotting paper D21F 11/14) [2]

- 17/02 • for blotting-paper sheets
- 17/04 • • hand-held
- 17/06 • for reeled blotting-paper
- 17/08 • • Roller blotters
- 17/10 • using blotting material other than paper

### 19/00 Erasers, rubbers, or erasing devices; Holders therefor (rubbers or erasing knives combined with writing implements B43K 29/02, B43K 29/18)

- 19/02 • Erasing knives (knives in general B26B)
- 19/04 • Fibrous erasers

### 21/00 Blackboard or slate-cleaning devices

- 21/02 • with means for absorbing the chalk dust
- 21/04 • Wiper holders

### 23/00 Sharpeners for pencils or leads (grinding or cutting tools in general B24, B26; combined with writing implements B43K 29/06) [2]

- 23/02 • with gearing
- 23/04 • • with cranked handles
- 23/06 • in which the pencils or leads are sharpened by only axial movement against cutting blades
- 23/08 • in which the pencils or leads are sharpened mainly by rotational movement against cutting blades (B43L 23/02 takes precedence)

### 25/00 Ink receptacles (liquid receptacles in general B65D, e.g. B65D 1/00)

- 25/02 • with separate dipping-cups
- 25/04 • • supplied by pressure arrangements
- 25/06 • • supplied by tilting the receptacles
- 25/08 • with arrangements for dissolving ink powder
- 25/10 • with means for holding objects
- 25/12 • with pen-wiping means

### 27/00 Ink stands

- 27/02 • having means for securing objects thereon
- 27/04 • securable to other objects

## B43M BUREAU ACCESSORIES NOT OTHERWISE PROVIDED FOR (stapling devices B25C, B27F; devices for temporarily attaching sheets together B42F; adhesive tape dispensers B65H 35/07)

### Subclass index

FIXING SEALS; INSERTING DOCUMENTS INTO, CLOSING, OR OPENING, ENVELOPES.....1/00, 3/00, 5/00, 7/00  
PAPER-WEIGHTS; DEVICES FOR APPLYING LIQUIDS; STAMP DISPENSERS; DRAWING-PINS  
OR THUMB-TACKS.....9/00, 11/00, 13/00, 15/00  
OTHER ACCESSORIES.....99/00

- |   |   |
|---|---|
| <p><b>1/00</b>    <b>Fixing seals on documents</b> (embossing dies B44B; seals <u>per se</u> G09F 3/00)</p> <p>1/02    • Sealing-wax holders</p> <p><b>3/00</b>    <b>Devices for inserting documents into envelopes</b> (combined devices for inserting documents into, and closing, envelopes B43M 5/00)</p> <p>3/02    • equipped with document-folding means (B43M 3/04 takes precedence)</p> <p>3/04    • automatic</p> <p><b>5/00</b>    <b>Devices for closing envelopes</b></p> <p>5/02    • Hand devices for both moistening gummed flaps of envelopes and for closing the envelopes</p> <p>5/04    • automatic</p> <p><b>7/00</b>    <b>Devices for opening envelopes</b> (cutting tools in general B26)</p> <p>7/02    • Devices for both opening envelopes and removing contents</p> <p><b>9/00</b>    <b>Paper-weights</b></p> | <p><b>11/00</b>    <b>Hand or desk devices of the office or personal type for applying liquid, other than ink, by contact to surfaces, e.g. for applying adhesive</b> (combined with envelope-closing devices B43M 5/02; reservoir brushes A46B 11/00; devices for applying liquids or other fluent materials to surfaces in general B05C; liquid receptacles B65D)</p> <p>11/02    • with rollers</p> <p>11/04    • with pads (B43M 11/06 takes precedence)</p> <p>11/06    • Hand-held devices</p> <p>11/08    • • of the fountain-pen type</p> <p><b>13/00</b>    <b>Dispensers without mechanisms for single stamps modified for the application of stamps to articles</b> (manually-controlled or manually-operable label or stamp dispensers B65C 11/00)</p> <p><b>15/00</b>    <b>Drawing-pins; Thumb-tacks</b> (extractors B25C 11/00)</p> <p><b>99/00</b>    <b>Subject matter not provided for in other groups of this subclass [2010.01]</b></p> |
|---|---|

## B44    DECORATIVE ARTS

### Note(s)

Any machine, apparatus, tool or process is classified in this class in so far as it produces an effect or mark meant to be judged by the eye and in so far as such machine, apparatus, tool or process is not provided for elsewhere.

**B44B    MACHINES, APPARATUS, OR TOOLS FOR ARTISTIC WORK, e.g. FOR SCULPTURING, GUILLOCHING, CARVING, BRANDING, INLAYING** (processes for producing decorative effects B44C; embossing leather C14B)

### Subclass index

THREE-DIMENSIONAL WORK; EMBOSSING.....1/00, 5/00  
TWO-DIMENSIONAL WORK; BRANDING; INLAYING.....3/00, 7/00, 9/00  
HAND TOOLS.....11/00

- |  |  |
|--|--|
| <p><b>1/00</b>    <b>Artists' machines or apparatus equipped with tools or work holders moving, or able to be controlled, three-dimensionally for making single sculptures or models</b> (copying devices for machine-tool use B23Q 35/00)</p> <p>1/02    • wherein three-dimensional copies are made</p> <p>1/04    • • having devices for changing, e.g. proportionally enlarging or reducing, the shape from an original pattern</p> <p>1/06    • Accessories</p> <p><b>3/00</b>    <b>Artists' machines or apparatus equipped with tools or work holders moving or able to be controlled substantially two-dimensionally for carving, engraving, or guilloching shallow ornamenting or markings</b> (marking or engraving metal by the action of a high concentration of electric current B23H 9/06; forme engraving B41C, B41D; engraving by photomechanical reproduction G03F)</p> <p>3/02    • wherein plane surfaces are worked</p> <p>3/04    • wherein non-plane surfaces are worked</p> <p>3/06    • Accessories, e.g. tool or work holders</p> | <p><b>5/00</b>    <b>Machines or apparatus for embossing decorations or marks, e.g. embossing coins</b> (corrugating sheet metal or metal tubes, embossing combined with sheet-metal-working operations B21D; embossing plastics or substances in a plastic state, in general B29C 59/00; embossing of paper or cardboard in general B31F 1/07; forme embossing B41C 1/08; embossing combined with application of ink, type marking presses, selective embossing mechanisms B41F, B41J, B41K, B41M; embossing leather C14B)</p> <p>5/02    • Dies; Accessories</p> <p><b>7/00</b>    <b>Machines, apparatus, or hand tools for branding</b> (burning or charring wood stock B27M 1/06)</p> <p>7/02    • Branding irons</p> <p><b>9/00</b>    <b>Machines or apparatus for inlaying with ornamental structures, e.g. tarsia or mosaic work</b> (uniting ornamental elements on a support B44C 1/28, to structures B44C 3/12; imitation of mosaic or tarsia-work patterns B44F 11/04)</p> <p><b>11/00</b>    <b>Artists' hand tools for sculpturing, kneading, carving, engraving, guilloching, or embossing; Accessories therefor</b></p> |
|--|--|

**B44B**

- |       |  |       |                 |
|-------|--|-------|-----------------|
| 11/02 | • for substantially two-dimensional carving, engraving, or guilloching | 11/04 | • for embossing |
|-------|--|-------|-----------------|

**B44C PRODUCING DECORATIVE EFFECTS** (processes for applying liquids or other fluent materials to surfaces, in general B05D; shaping of plastics or substances in a plastic state B29C; printing processes to produce transfer pictures B41M 3/12; thermographic duplication or marking methods B41M 5/00); **MOSAICS; TARSIA WORK** (imitation of mosaic or tarsia-work patterns B44F 11/04); **PAPERHANGING** [2]

**Note(s)**

In this subclass, the following expression is used with the meaning indicated:

- "decorative effects", when used in connection with the expressions "transfer picture" or "decalcomanias", covers also "information".

**1/00 Processes, not specifically provided for elsewhere, for producing decorative surface effects** (decorating textiles D06Q)

- |       |   |
|-------|---|
| 1/02  | • Pyrography  |
| 1/04  | • Producing precipitations (producing precipitations by electrolysis C25D) [2]                              |
| 1/10  | • Applying flat material, e.g. leaflets, pieces of fabrics (paperhanging B44C 7/00)                         |
| 1/14  | • • Metallic leaves or foils, e.g. gold leaf  |
| 1/16  | • for applying transfer pictures or the like [4]  |
| 1/165 | • • for decalcomanias; Sheet materials therefor (apparatus or machines for applying decalcomanias B65C) [4] |
| 1/17  | • • • Dry transfer [4]  |
| 1/175 | • • • Transfer using solvent [4]  |
| 1/18  | • Applying ornamental structures, e.g. shaped bodies consisting of plastic material                         |
| 1/20  | • Applying plastic materials and superficially modelling the surface of these materials                     |
| 1/22  | • Removing surface-material, e.g. by engraving, by etching  |
| 1/24  | • Pressing or stamping ornamental design on surfaces  |
| 1/26  | • Inlaying with ornamental structures, e.g. niello work, tarsia work  |
| 1/28  | • Uniting ornamental elements on a support, e.g. mosaics  |

**3/00 Processes, not specifically provided for elsewhere, for producing ornamental structures**

- |      |   |
|------|---|
| 3/02 | • Superimposing layers  |
| 3/04 | • Modelling plastic materials, e.g. clay                        |
| 3/06 | • Sculpturing   |
| 3/08 | • Stamping or bending   |
| 3/10 | • Producing and filling perforations, e.g. tarsia plates        |
| 3/12 | • Uniting ornamental elements to structures, e.g. mosaic plates |

**5/00 Processes for producing special ornamental bodies**

- |      |  |
|------|--|
| 5/02 | • Mountings for pictures; Mountings of horns on plates   |
| 5/04 | • Ornamental plaques, e.g. decorative panels, decorative veneers   |
| 5/06 | • Natural ornaments; Imitations thereof (artificial flowers, fruit, leaves A41G 1/00; artificial feathers A41G 11/00)  |
| 5/08 | • Leaded lights (imitations thereof B44F 1/06; joining glass surfaces to glass surfaces or to surfaces of other inorganic material to form a layered product C03C 27/00) |

**7/00 Paperhanging**

- |      |  |
|------|--|
| 7/02 | • Machines, apparatus, tools, or accessories therefor (implements or apparatus for removing paint-covering adhering to surfaces B44D 3/16) |
| 7/04 | • • for applying adhesive [2]  |
| 7/06 | • • for applying the paper to the surface to be covered [2]  |
| 7/08 | • • for finishing operations [2]   |

**B44D PAINTING OR ARTISTIC DRAWING, NOT OTHERWISE PROVIDED FOR; PRESERVING PAINTINGS; SURFACE TREATMENT TO OBTAIN SPECIAL ARTISTIC SURFACE EFFECTS OR FINISHES** (surface treatment in general, see the relevant places, e.g. applying liquids or other fluent materials B05) [2]

**2/00 Special techniques in artistic painting or drawing, e.g. oil painting, water painting, pastel painting, relief painting** [2]

**3/00 Accessories or implements for use in connection with painting or artistic drawing, not otherwise provided for** (hand tools for applying liquids, e.g. paints, to surfaces B05C 17/00; implements for finishing work on buildings, other than painting, E04F 21/00); **Methods or devices for colour determination, selection, or synthesis, e.g. use of colour tables** (colorimetry G01J 3/00) [2]

- |      |   |
|------|---|
| 3/02 | • Palettes  |
| 3/04 | • Paint boxes   |
| 3/06 | • Implements for stirring or mixing paints (mixing in general B01F) |
| 3/08 | • • for liquid or semi-liquid paints                                |

- |      |  |
|------|--|
| 3/10 | • • Sieves; Spatulas   |
| 3/12 | • Paint cans; Brush holders; Containers for storing residual paint   |
| 3/14 | • • Holders for paint cans   |
| 3/16 | • Implements or apparatus for removing dry paint from surfaces, e.g. by scraping, by burning (chemical paint-removers C09D 9/00) [2] |
| 3/18 | • Boards or sheets with surfaces prepared for painting or drawing pictures; Stretching frames for canvases [2]                       |
| 3/22 | • Implements or apparatus for special techniques, e.g. for painting lines, for pouring varnish; Batik pencils                        |
| 3/24 | • Lamps for baking lacquers; Painters' belts; Apparatus for dissolving dried paints, for heating paints [2]                          |
| 3/38 | • Cord line chalkers   |

- 5/00 Surface treatment to obtain special artistic surface effects or finishes** (pretreatment or after-treatment of surface coated by applying liquids B05D 3/00; obtaining special surface effects by applying liquids or other fluent

materials to surfaces B05D 5/00; surface shaping of plastics, e.g. embossing, B29C 59/00) [2]

- 5/10 • Mechanical treatment

- 7/00 Preserving paintings, e.g. by varnishing**

## **B44F SPECIAL DESIGNS OR PICTURES**

### **1/00 Designs or pictures characterised by special or unusual light effects**

- 1/02 • produced by reflected light, e.g. matt surfaces, lustrous surfaces
- 1/04 • • after passage through surface layers, e.g. pictures with mirrors on the back
- 1/06 • produced by transmitted light, e.g. transparencies, imitations of glass-paintings
- 1/08 • characterised by colour effects
- 1/10 • • Changing, amusing, or secret pictures
- 1/12 • • Securities or banknotes as far as the design or protection against forgery is of importance
- 1/14 • • Iridescent effects

### **3/00 Designs characterised by outlines**

- 5/00 Designs characterised by irregular areas, e.g. mottled patterns** (imitating natural patterns or artistic work B44F 9/00, B44F 11/00)

### **7/00 Designs imitating three-dimensional effects**

#### **9/00 Designs imitating natural patterns**

- 9/02 • wood grain effects
- 9/04 • of stone surfaces, e.g. marble
- 9/06 • of horn, ivory, or meerschaum surfaces
- 9/08 • of crystalline structures, pearl effects, or mother-of-pearl effects
- 9/10 • of metallic or oxidised metallic surfaces
- 9/12 • of leather

#### **11/00 Designs imitating artistic work**

- 11/02 • Imitation of pictures, e.g. oil paintings
- 11/04 • Imitation of mosaic or tarsia-work patterns
- 11/06 • Imitation of ceramic patterns

TRANSPORTING

B60 VEHICLES IN GENERAL

Note(s)

In this class, the following term is used with the meaning indicated:

- "vehicle" means all vehicles except those restricted to one of the following types of vehicles: rail vehicles, waterborne vessels, aircraft, space vehicles, hand carts, cycles, animal-drawn vehicles, and sledges, which are covered by the relevant subclasses of B61-B64.  
Thus the term "vehicle" includes:
  - vehicular characteristics which are common to more than one of the above-listed types;
  - certain characteristics restricted to automobiles, road or cross-country trailers.
  - The following exceptions to the above should be noted:
    - a. subclass B60B or B60C embrace all vehicle wheels and tyres, except wheels for roller skates A63C 17/22, wheels for model railway vehicles A63H 19/22, and special adaptations of wheels or tyres for aircraft B64C 25/36;
    - b. subclass B60C embraces the connection of valves to inflatable elastic bodies in general, and in this respect it is not limited to vehicles;
    - c. subclass B60L embraces certain electric equipment of all electrically-propelled vehicles;
    - d. subclass B60M embraces certain power supply equipment for, but external to, any kind of electrically-propelled vehicle;
    - e. subclass B60R embraces safety belts or body harnesses used in all types of land vehicles;
    - f. subclass B60S relates to all kinds of vehicles, except the servicing of rail locomotives B61K 11/00, ground equipment for aircraft B64F, or cleaning apparatus peculiar to waterborne vessels B63B 57/00, B63B 59/00;
    - g. subclass B60T includes brake control systems of general applicability, and in this respect it is not limited to vehicles. It also includes rail-vehicle power-brake systems and some other features of rail-vehicle brake systems;
    - h. subclass B60V embraces air-cushion vehicles per se and land vehicles, waterborne vessels or aircraft combined with features allowing them to alternatively operate as air-cushion vehicles or to be partially supported by an air cushion.

B60B VEHICLE WHEELS (making wheels or wheel parts by rolling B21H 1/00, by forging, hammering or pressing B21K 1/28); CASTORS; AXLES; INCREASING WHEEL ADHESION

Note(s)

Attention is drawn to the Note following the title of class B60.

Subclass index

WHEELS	
General structure.....	1/00, 3/00
Characterised by the material.....	5/00
Ornamental characteristics.....	7/00
Particular structures: highly- resilient; multiple or multi-tyred; adhesion-increasing; rail-engaging.....	9/00, 11/00, 15/00, 17/00
Component parts	
spokes; rims.....	1/00, 21/00, 23/00, 25/00
hubs.....	27/00
Other wheels.....	19/00
AXLES; WHEEL-AXLE COMBINATIONS.....	35/00, 37/00
INCREASING WHEEL ADHESION, OTHERWISE THAN BY WHEEL STRUCTURE.....	39/00
MOUNTING, HOLDING OR ASSEMBLING WHEELS.....	29/00, 30/00, 31/00
CASTORS IN GENERAL.....	33/00

<b>Wheels</b>	1/06	• Wheels with compression spokes (wheels of high resiliency B60B 9/00)
<b>1/00 Spoked wheels; Spokes thereof</b> (non-metallic B60B 5/00) [2]	1/08	• • formed by casting
1/02 • Wheels with wire or other tension spokes	1/10	• • fabricated from sheet metal (B60B 1/12, B60B 3/08 take precedence)
1/04 • • Attaching spokes to rim or hub	1/12	• • with tubular spokes (B60B 1/08 takes precedence)



- 1/14 • • Attaching spokes to rim or hub

**3/00 Disc wheels, i.e. wheels with load-supporting disc body** (non-metallic B60B 5/00; wheel cover discs B60B 7/00)

- 3/02 • with a single disc body integral with rim  
 3/04 • with a single disc body not integral with rim  
 3/06 • formed by casting  
 3/08 • with disc body formed by two or more axially-spaced discs  
 3/10 • apertured to simulate spoked wheels  
 3/12 • Means of reinforcing disc bodies  
 3/14 • Attaching disc body to hub (resiliently B60B 9/00; attaching rim to wheel body B60B 23/00)  
 3/16 • • by bolts or the like  
 3/18 • • by circlips or the like

**5/00 Wheels, spokes, disc bodies, rims, hubs, wholly or predominantly made of non-metallic material** (wheel cover discs B60B 7/00; wheels of high resiliency B60B 9/00)

- 5/02 • made of synthetic material  
 5/04 • made of wood

**7/00 Wheel cover discs, rings, or the like, for ornamenting, protecting, or obscuring, wholly or in part, the wheel body, rim, hub, or tyre sidewall [2, 5]**

- 7/01 • Rings specially adapted for covering only the wheel rim or the tyre sidewall, e.g. removable tyre sidewall trim rings [5]  
 7/02 • made essentially in one part (B60B 7/01 takes precedence) [5]  
 7/04 • built-up of several main parts (B60B 7/01, B60B 7/20 take precedence) [5]  
 7/06 • Fastening arrangements therefor (B60B 7/01, B60B 7/16 take precedence) [5]  
 7/08 • • having gripping elements consisting of formations integral with the cover [5]  
 7/10 • • comprising a plurality of spaced spring clips individually mounted on the cover, e.g. riveted, welded or readily releasable [5]  
 7/12 • • comprising an annular spring or gripping element mounted on the cover (B60B 7/08 takes precedence) [5]  
 7/14 • • comprising screw-threaded means [5]  
 7/16 • Anti-theft devices [5]  
 7/18 • simulating spoked or wire wheel [5]  
 7/20 • having an element mounted for rotation independently of wheel rotation [5]

**9/00 Wheels of high resiliency**

- 9/02 • using springs (wheels comprising resilient spokes B60B 9/26)  
 9/04 • • in leaf form  
 9/06 • • in helical form  
 9/08 • • in flat coiled form  
 9/10 • • of rubber or the like  
 9/12 • • • in the form of sleeves or rings concentric with wheel axis  
 9/14 • • • with means limiting relative lateral movements between hub and remainder of wheel  
 9/16 • • • modified to ensure electric conductivity  
 9/18 • using fluid (within spokes B60B 9/26)  
 9/20 • • in rings concentric with wheel axis  
 9/22 • • • inflatable  
 9/24 • • with pistons and cylinders  
 9/26 • comprising resilient spokes

- 9/28 • • with telescopic action

**11/00 Units comprising multiple wheels arranged side by side; Wheels having more than one rim or capable of carrying more than one tyre**

- 11/02 • Units of separate wheels mounted for independent or coupled rotation  
 11/04 • Wheels with a rim capable of carrying more than one tyre  
 11/06 • Wheels with more than one rim mounted on a single wheel body  
 11/08 • Arrangements of balancing mechanisms enabling a uniform distribution of load to the tyres  
 11/10 • Emergency wheels (tyres collapsible into storage or non-use condition B60C 3/08; tyres characterised by means enabling restricted operation in damaged or deflated condition B60C 17/00) [5]

**15/00 Wheels or wheel attachments designed for increasing traction** (vehicle tyres B60C; non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels B60C 27/00)

- 15/02 • Wheels with spade lugs  
 15/04 • • with resiliently-mounted spade lugs  
 15/06 • • with pivotally-mounted spade lugs  
 15/08 • • with spade lugs axially displaced relatively to the tread surface of the tyre  
 15/10 • • with radially-adjustable spade lugs; Control mechanisms therefor  
 15/12 • • • involving cams or eccentric hoops  
 15/14 • • • involving an axially-displaceable cone  
 15/16 • • • involving gearing, e.g. gear pinions acting upon threaded shafts on the spade lugs  
 15/18 • Wheels with ground-engaging plate-like shoes  
 15/20 • • with resiliently-mounted shoes, e.g. on a spider  
 15/22 • • connected by links to the hub  
 15/24 • Tread bands or rings for fairing lugs when travelling on the road  
 15/26 • Auxiliary wheels or rings with traction-increasing surface attachable to the main wheel body  
 15/28 • Wheel-ballasting weights; Their attachment

**17/00 Wheels characterised by rail-engaging elements** (of model railways A63H 19/22) [2]

- 17/02 • with elastic tyres

**19/00 Wheels not otherwise provided for or having characteristics specified in one of the subgroups of this group**

- 19/02 • convertible, e.g. from road wheel to rail wheel; Wheels specially designed for alternative use on road and rail  
 19/04 • expansible  
 19/06 • with compartments for fluid, packing, or loading material; Buoyant wheels  
 19/08 • with lubricating passages, channels, or reservoirs  
 19/10 • with cooling fins  
 19/12 • Roller-type wheels (B60B 19/06 takes precedence)  
 19/14 • Ball-type wheels (B60B 19/06 takes precedence)

**Rims; Hubs**

- 21/00 Rims** (non-metallic B60B 5/00; of high resiliency B60B 9/00; capable of carrying more than one tyre B60B 11/04; multiple rims on single wheel body B60B 11/06; of multi-part type B60B 25/00; metal tyres B60C)

## B60B

- 21/02 • characterised by transverse section
- 21/04 • • with substantially-radial flanges (with rail-engaging flanges B60B 17/00)
- 21/06 • characterised by means for attaching spokes
- 21/08 • characterised by having braking surfaces
- 21/10 • characterised by the form of tyre-seat or flange, e.g. corrugated (B60B 21/02 takes precedence)
- 21/12 • Accessories, e.g. lining bands

**23/00 Attaching rim to wheel body** (attaching spokes to rim B60B 1/04, B60B 1/14; attaching rims resiliently to wheel body B60B 9/00)

### Note(s)

Group B60B 23/12 takes precedence over groups B60B 23/02-B60B 23/06.

- 23/02 • by split or other expansible ring devices
  - 23/04 • by bayonet-joint, screw-thread, or like attachments
  - 23/06 • by screws, bolts, pins, or clips
  - 23/08 • • arranged radially
  - 23/10 • • arranged axially
  - 23/12 • by devices arranged to permit variation of axial position of rim relative to wheel body for track-width adjustment
- 25/00 Rims built-up of several main parts** (tools for assembling divided rims B60B 31/04)
- 25/02 • Segmented rims, e.g. with segments arranged in sections; Connecting equipment, e.g. hinges; Insertable flange rings therefor
  - 25/04 • Rims with dismountable flange rings, seat rings, or lock rings
  - 25/06 • • Split flange rings, e.g. transversely split; Connecting equipment for overlapping the slot
  - 25/08 • • Continuous flange rings; Arrangement of recesses enabling the flange ring to be slipped over the rim body
  - 25/10 • • Seat rings for the tyre bead part, e.g. split
  - 25/12 • • • with integral flange part
  - 25/14 • • Locking means for flange rings or seat rings
  - 25/16 • • • Arrangement of bayonet catches
  - 25/18 • • • Arrangement of split rings
  - 25/20 • • • Arrangement of screw, bolts, or shouldered pins
  - 25/22 • Other accessories, e.g. for sealing the component parts enabling the use of tubeless tyres

**27/00 Hubs** (non-metallic B60B 5/00; of high resiliency B60B 9/00)

- 27/02 • adapted to be rotatably arranged on axle
- 27/04 • • housing driving means, e.g. sprockets
- 27/06 • adapted to be fixed on axle

## Apparatus or tools for mounting, holding or assembling wheels

**29/00 Apparatus or tools for mounting or dismounting wheels** (characterised by the means for holding the wheels B60B 30/00) [5]

**30/00 Means for holding wheels or parts thereof** (spare wheel stowing, holding or mounting arrangements on vehicles B62D 43/00) [5]

- 30/02 • engaging the tyre, e.g. the tyre being mounted on the wheel rim [5]
- 30/04 • • the tyre not being mounted on a rim, i.e. holders or supports for tyres alone [5]
- 30/06 • engaging the wheel body, e.g. the rim [5]

- 30/08 • • the central part of the wheel body [5]
- 30/10 • characterised by being provided on a dolly [5]

**31/00 Apparatus or tools for assembling or disassembling wheels**

- 31/02 • for tightening or straightening wire spokes in situ; for extracting spokes from wheels
- 31/04 • for assembling divided rims
- 31/06 • for removing or attaching cover discs, hub caps, or the like [2]

**33/00 Castors in general** (castors for large containers B65D 90/18)

- 33/02 • with disengageable swivel action
- 33/04 • adjustable
- 33/06 • • mounted retractably
- 33/08 • Ball castors

**35/00 Axle units; Parts thereof** (resilient suspension of a rigid axle or axle housing B60G 9/00; steerable vehicle stub-axles B62D)

- 35/02 • Dead axles, i.e. not transmitting torque (axle housings for torque transmitting elements B60B 35/16)
- 35/04 • • straight
- 35/06 • • cranked
- 35/08 • • of closed hollow section
- 35/10 • • adjustable for varying track
- 35/12 • Torque-transmitting axles
- 35/14 • • composite or split, e.g. half-axles; Couplings between axle parts or sections (B60G 3/24 takes precedence)
- 35/16 • • characterised by the axle housings for the torque transmitting elements, e.g. for shafts
- 35/18 • • characterised by the arrangement of the bearings for the torque transmitting elements in the axle housings

**37/00 Wheel-axle combinations, e.g. wheel sets** (units comprising multiple wheels arranged side by side B60B 11/00; rail-vehicle axle-boxes B61F)

- 37/02 • the wheels being integral with solid axles
- 37/04 • the wheels being rigidly attached to solid axles
- 37/06 • the wheels being integral with, or rigidly attached to, hollow axles
- 37/08 • • the hollow axles being rotatable around fixed axles
- 37/10 • the wheels being individually rotatable around the axles
- 37/12 • Axles with a fixed wheel and a loose wheel

**39/00 Increasing wheel adhesion** (wheels or wheel attachments designed for increasing traction B60B 15/00; vehicle tyres B60C; non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels B60C 27/00; road surface conditioning to prevent slipperiness E01C)

- 39/02 • Vehicle fittings for scattering or dispensing material in front of its wheels
- 39/04 • • the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles B61H)
- 39/06 • • • the dispensing being effected by mechanical means
- 39/08 • • • the dispensing being effected by fluid means
- 39/10 • • • the dispensing being controlled electrically or electromagnetically

39/12 • • the material being sheet-like or web-like

**B60C VEHICLE TYRES** (manufacture, repairing B29); **TYRE INFLATION; TYRE CHANGING; CONNECTING VALVES TO INFLATABLE ELASTIC BODIES IN GENERAL; DEVICES OR ARRANGEMENTS RELATED TO TYRES** (testing of tyres G01M 17/02) [5]

### Note(s)

- In this subclass, the following term is used with the meaning indicated:
  - "tyre" means a separate ground-engaging, continuous element outside the periphery of the wheel rim and includes the tyre casing, cover, or jacket and any insert, e.g. inner tube. In group B60C 29/00, relating to connection of valves, the term "tyre" also includes inflatable elastic bodies other than tyres or inner tubes.
- Attention is drawn to the Note following the title of class B60.

### Subclass index

#### TYRES

Characterised by material.....	1/00
Characterised by transverse section.....	3/00
General structure.....	5/00, 7/00, 19/00
Parts; reinforcements; treads; walls; beads; other parts.....	9/00, 11/00, 13/00, 15/00, 19/00
Particular devices.....	17/00, 27/00

#### MOUNTING, INFLATION

Inflating devices, pressure or temperature control.....	23/00, 29/00
Apparatus or tools.....	25/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

**1/00 Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition [4]**

#### Note(s)

Tyres characterised by the compositions only, i.e. having no significant tyre structure, are classified only with the compositions, e.g. in C08K, C08L.

**3/00 Tyres characterised by transverse section** (characterised by rail-engaging elements B60B 17/00) [4]

- 3/02 • Closed, e.g. toroidal, tyres [4]
- 3/04 • characterised by the relative dimensions of the section, e.g. low profile (B60C 3/06 takes precedence) [4]
- 3/06 • asymmetric [4]
- 3/08 • collapsible into storage or non-use condition, e.g. space-saving spare tyres (run-flat tyres B60C 17/08) [4]

**5/00 Inflatable pneumatic tyres or inner tubes** (B60C 1/00, B60C 9/00-B60C 17/00 take precedence) [4]

- 5/01 • without substantial cord reinforcement, e.g. cordless tyres, cast tyres [4]
- 5/02 • having separate inflatable inserts, e.g. with inner tubes; Means for lubricating, venting, preventing relative movement between tyre and inner tube (B60C 5/20 takes precedence) [4]
- 5/04 • • Shape or construction of inflatable inserts (B60C 5/10 takes precedence) [4]
- 5/08 • • • having reinforcing means
- 5/10 • formed as a single discontinuous ring with contiguous ends which may be connected together [4]
- 5/12 • without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim (B60C 5/20 takes precedence) [4]

- 5/14 • • with impervious liner or coating on the inner wall of the tyre [4]

- 5/16 • • Sealing means between beads and rims, e.g. bands

- 5/18 • Sectional casings, e.g. comprising replaceable arcuate parts

- 5/20 • having multiple separate inflatable chambers (with additional tubes which become load supporting in emergence B60C 17/02) [4]

- 5/22 • • the chambers being annular [4]

- 5/24 • • the walls of the chambers extending transversely of the tyre [4]

**7/00 Non-inflatable or solid tyres** (B60C 1/00 takes precedence; tyres or rims characterised by rail-engaging elements B60B 17/00) [2]

- 7/02 • made from ropes or bristles
- 7/04 • made of wood or leather
- 7/06 • made of metal
- 7/08 • built-up from a plurality of arcuate parts
- 7/10 • characterised by means for increasing resiliency (highly resilient wheels B60B 9/00)
- 7/12 • • using enclosed chambers, e.g. gas-filled (inflatable tyres B60C 5/00) [4]
- 7/14 • • using springs
- 7/16 • • • of helical or flat coil form
- 7/18 • • • • disposed radially relative to wheel axis
- 7/20 • • • • disposed circumferentially relative to wheel axis
- 7/22 • having inlays other than for increasing resiliency, e.g. for armouring
- 7/24 • characterised by means for securing tyres on rim or wheel body
- 7/26 • • using bolts
- 7/28 • • using straps or the like, e.g. vulcanised into the tyre

**9/00 Reinforcements or ply arrangement of pneumatic tyres** (inserts having reinforcing means B60C 5/08; bead structure, e.g. turnup or overlap construction, B60C 15/00; tyre cords per se D02G 3/48; fabrics per se D03D, D04H; metal ropes or cables, per se D07B 1/06) **[4]**

**Note(s)**

When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned.

- 9/02 • Carcasses
- 9/04 • • the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
- 9/06 • • • the cords extend diagonally from bead to bead and run in opposite directions in each successive carcass ply, i.e. bias angle ply (B60C 9/07, B60C 9/09 take precedence) **[4]**
- 9/07 • • • the cords curve from bead to bead in plural planes, e.g. S-shaped cords **[4]**
- 9/08 • • • the cords extend transversely from bead to bead, i.e. radial ply (B60C 9/07 takes precedence) **[4]**
- 9/09 • • • • combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply **[4]**
- 9/10 • • the reinforcing cords within each carcass ply arranged in a crossing relationship
- 9/11 • • • Woven, braided, or knitted plies **[4]**
- 9/12 • • built-up with rubberised layers of discrete fibres or filaments
- 9/13 • • • with two or more differing cord materials **[4]**
- 9/14 • • built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
- 9/16 • • built-up with metallic reinforcing inlays
- 9/17 • • asymmetric to the midcircumferential plane of the tyre **[4]**
- 9/18 • Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers
- 9/20 • • built-up from rubberised plies each having all cords arranged substantially parallel
- 9/22 • • • the plies being arranged with all cords disposed along the circumference of the tyre
- 9/24 • • built-up of arcuate parts
- 9/26 • • Folded plies **[4]**
- 9/28 • • characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence) **[4]**
- 9/30 • • asymmetric to the midcircumferential plane of the tyre **[4]**

**11/00 Tyre tread bands; Tread patterns; Anti-skid inserts**

- 11/01 • Shape of the shoulders between tread and sidewall, e.g. rounded, stepped, cantilevered (arrangements of grooves or ribs on the sidewalls B60C 13/02) **[4]**
- 11/02 • Replaceable treads
- 11/03 • Tread patterns **[4]**
- 11/04 • • in which the raised area of the pattern consists only of continuous circumferential ribs, e.g. zig-zag (B60C 11/12, B60C 11/13 take precedence) **[4, 6]**
- 11/11 • • in which the raised area of the pattern consists only of isolated elements, e.g. blocks (B60C 11/12, B60C 11/13 take precedence) **[4]**

- 11/113 • • in which the raised area of the pattern consists only of projections extending continuously across the tread from one edge to the other **[6]**
- 11/117 • • formed only by isolated recesses, e.g. grooves, slots or holes (B60C 11/12, B60C 11/13 take precedence) **[6]**
- 11/12 • • characterised by the use of narrow slits or incisions, e.g. sipes **[4]**
- 11/13 • • characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping **[6]**
- 11/14 • Anti-skid inserts, e.g. vulcanised into the tread band
- 11/16 • • of plug form, e.g. made from metal, textile
- 11/18 • • or strip form, e.g. metallic combs, rubber strips of different wear resistance (B60C 11/20 takes precedence)
- 11/20 • • in coiled form
- 11/22 • Tread rings between dual tyres **[4]**
- 11/24 • Wear-indicating arrangements **[4]**

**13/00 Tyre sidewalls; Protecting, decorating, marking, or the like, thereof** (B60C 17/08 takes precedence; tyre shoulders B60C 11/01; removable tyre sidewall trim rings B60B 7/01) **[4, 5]**

- 13/02 • Arrangement of grooves or ribs **[4]**
- 13/04 • having annular inlays or covers, e.g. white sidewalls **[4]**

**15/00 Tyre beads, e.g. ply turn-up or overlap**

- 15/02 • Seating or securing beads on rims (sealing means between beads and rims of tubeless tyres B60C 5/16; means for securing solid tyres on rims B60C 7/24; rims B60B 21/00) **[4]**
- 15/024 • • Bead contour, e.g. lips, grooves, or ribs **[4]**
- 15/028 • • Spacers between beads (emergency load-supporting means B60C 17/00) **[4]**
- 15/032 • • • inflatable **[4]**
- 15/036 • • Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation **[4]**
- 15/04 • Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48) **[4]**
- 15/05 • • multiple, i.e. with two or more cores in each bead **[4]**
- 15/06 • Flipper strips, fillers, or chafing strips

**17/00 Tyres characterised by means enabling restricted operation in damaged or deflated condition; Accessories therefor** (having multiple separate inflatable chambers B60C 5/20)

- 17/01 • utilising additional inflatable supports which become load-supporting in emergency **[4]**
- 17/02 • • inflated or expanded in emergency only **[4]**
- 17/04 • utilising additional non-inflatable supports which become load-supporting in emergency
- 17/06 • • resilient **[4]**
- 17/08 • Means facilitating folding of sidewalls, e.g. run-flat sidewalls (for storage purposes B60C 3/08) **[4]**
- 17/10 • Internal lubrication **[4]**

**19/00 Tyre parts or constructions not otherwise provided for**

- 19/04 • Tyre with openings closeable by means other than the rim; Closing means therefor
- 19/08 • Electric-charge-dissipating arrangements
- 19/12 • Puncture preventing arrangements (B60C 9/00 takes precedence; inflatable inserts having reinforcing means B60C 5/08) **[4]**

23/00	<b>Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles</b> (measuring in general G01, e.g. G01L 17/00; remote signalling in general G08); <b>Arrangement of tyre inflating devices on vehicles, e.g. of pumps, of tanks</b> (air pumps <u>per se</u> F04; tanks <u>per se</u> F17C); <b>Tyre cooling arrangements</b> [3]	25/132	• • • for removing and mounting tyres (for only seating the beads B60C 25/12; for only breaking the beads B60C 25/125) [5]
23/02	• Signalling devices actuated by tyre pressure	25/135	• • • • having a tyre support or a tool, movable along wheel axis [5]
23/04	• • mounted on the wheel or tyre	25/138	• • • • • with rotary motion of tool or tyre support [5]
23/06	• Signalling devices actuated by deformation of the tyre (wear-indicating arrangements B60C 11/24)	25/14	• Apparatus or tools for spreading tyre beads (B60C 25/12 takes precedence) [5]
23/08	• • by touching the ground	25/15	• • with means for inverting the tyre [5]
23/10	• Arrangement of tyre-inflating pumps mounted on vehicles	25/18	• Tools for mounting or demounting air valves
23/12	• • operated by a running wheel	25/20	• Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims
23/14	• • operated by the prime mover of the vehicle		
23/16	• Arrangement of air tanks mounted on vehicles	<b>27/00</b>	<b>Non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels</b>
23/18	• Tyre cooling arrangements [3, 4]	27/02	• extending over restricted arcuate part of tread (B60C 27/20 takes precedence)
23/19	• • for dissipating heat [4]	27/04	• • the ground-engaging part being rigid
23/20	• Devices for measuring or signalling tyre temperature [3]	27/06	• extending over the complete circumference of tread, e.g. made of chains (B60C 27/20 takes precedence)
<b>25/00</b>	<b>Apparatus or tools adapted for mounting, removing or inspecting tyres</b> (apparatus or tools characterised by the means for holding wheels or parts thereof B60B 30/00) [5]	27/08	• • involving lugs or rings taking up wear
25/01	• for removing tyres from, or mounting tyres on, wheels [5]	27/10	• • having tensioning means
25/02	• • Tyre levers or the like, e.g. hand-held (machine operated B60C 25/05) [5]	27/12	• • • resilient
25/04	• • • pivotal about the wheel axis, or movable along the rim edge, e.g. rollable [5]	27/14	• • automatically attachable
25/05	• • Machines [5]	27/16	• • formed of close material, e.g. leather
25/12	• • • for only seating the beads [5]	27/18	• • • the material being fabric, e.g. woven wire
25/122	• • • • acting on the tyre tread [5]	27/20	• having ground-engaging plate-like elements
25/125	• • • • for only breaking the beads [5]	27/22	• for tandem tyres (endless-track features B62D)
25/128	• • • • acting axially on the whole circumference of the bead or side wall [5]	<b>29/00</b>	<b>Arrangements of tyre-inflating valves to tyres or rims; Accessories for tyre-inflating valves, not otherwise provided for</b> (tools for mounting or demounting valves B60C 25/18; valves <u>per se</u> , valve dust caps F16K) [4, 5]
25/13	• • • • acting axially at localised regions of the bead or side wall [5]	29/02	• Connection to rims [4]
		29/04	• Connection to tyres [4]
		29/06	• Accessories for tyre-inflating valves, e.g. housings, guards, covers for valve caps, locks, not otherwise provided for [5]
		<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>

## **B60D VEHICLE CONNECTIONS** (components of brake systems B60T 17/04)

### Note(s)

Attention is drawn to the Note following the title of class B60.

<b>1/00</b>	<b>Traction couplings; Hitches; Draw-gear; Towing devices</b> (devices specially adapted for connection between tractors and agricultural machines or implements A01B 59/00; fifth-wheel couplings B62D) [2]	1/14	• Draw-gear or towing devices characterised by their type [4]
1/01	• Traction couplings or hitches characterised by their type [5]	1/145	• • consisting of an elongated single bar or tube [5]
1/02	• • Bolt or shackle-type couplings [5]	1/155	• • • comprising telescopic or foldable parts [5]
1/04	• • Hook or hook-and-hasps couplings [5]	1/167	• • consisting of articulated or rigidly assembled bars or tubes forming a V-, Y- or U-shaped draw gear (B60D 1/173 takes precedence) [5]
1/06	• • Ball-and-socket hitches [5]	1/173	• • consisting of at least two bars which are not connected or articulated to each other [5]
1/07	• • Multi-hitch devices, i.e. comprising several hitches of the same or of a different type; Hitch-adaptors, i.e. for converting hitches from one type to another [5]	1/18	• • Tow ropes, chains, or the like
		1/24	• characterised by arrangements for particular functions [5]
		1/26	• • for remote control, e.g. for releasing [5]
		1/28	• • for preventing unwanted disengagement, e.g. safety appliances [5]

B60D

1/30	• • for sway control [5]	1/56	• • securing to the vehicle bumper [5]
1/32	• • • involving damping devices [5]	1/58	• Auxiliary devices [5]
1/34	• • • involving springs [5]	1/60	• • Covers, caps or guards [5]
1/36	• • for facilitating connection, e.g. hitch catchers [5]	1/62	• • involving supply lines, electric circuits, or the like [5]
1/38	• • • involving auxiliary cables for drawing the trailer to the tractor before coupling [5]	1/64	• • • Couplings or joints therefor [5]
1/40	• • • involving a temporarily extensible or alignable member (B60D 1/38 takes precedence) [5]	1/66	• • Props [5]
1/42	• • for being adjustable [5]	3/00	<b>Fittings to facilitate pushing</b> (B60D 1/00 takes precedence; vehicle bumpers B60R 19/02; steering arrangements for backing a normally-drawn trailer B62D 13/06)
1/44	• • • horizontally [5]	5/00	<b>Gangways for coupled vehicles, e.g. of concertina type</b>
1/46	• • • vertically [5]	99/00	<b>Subject matter not provided for in other groups of this subclass [2009.01]</b>
1/48	• characterised by the mounting [5]		
1/50	• • resiliently mounted (B60D 1/30 takes precedence) [5]		
1/52	• • removably mounted (B60D 1/56 takes precedence) [5]		
1/54	• • collapsible or retractable when not in use, e.g. hide-away hitches (B60D 1/52 takes precedence) [5]		

**B60F VEHICLES FOR USE BOTH ON RAIL AND ON ROAD; VEHICLES CAPABLE OF TRAVELLING IN OR ON DIFFERENT MEDIA, e.g. AMPHIBIOUS VEHICLES** (air-cushion vehicles B60V)

1/00	<b>Vehicles for use both on rail and on road; Conversions therefor</b>	5/00	<b>Other vehicles capable of travelling in or on different media</b> (vehicles having alternatively-usable runners and wheels B62B 13/18; flying-boats or seaplanes B64C 35/00)
1/02	• with rail and road wheels on the same axle		
1/04	• with rail and road wheels on different axles	5/02	• convertible into aircraft
3/00	<b>Amphibious vehicles, i.e. vehicles capable of travelling both on land and on water; Land vehicles capable of travelling under water</b> (buoyant wheels B60B)		

**B60G VEHICLE SUSPENSION ARRANGEMENTS** (air-cushion vehicles B60V; connections between vehicle bodies and vehicle frames B62D 24/00) [5]

Note(s)

Attention is drawn to the Note following the title of class B60.

Subclass index

RIGID SUSPENSION.....	1/00
RESILIENT SUSPENSION	
General structures	
for single wheels; single sets of tandem wheels; pivoted suspension arms and accessories therefor....	3/00, 5/00, 7/00
for rigid axle or axle housing for two or more wheels.....	9/00
Characterised by arrangement, location, or kind of: springs; vibration-dampers; or combined springs and dampers.....	11/00, 13/00, 15/00
Characterised by adjustment.....	17/00
SUSPENSIONS WITH MEANS FOR SENSING GROUND UNEVENNESS.....	23/00
INTERCONNECTED SYSTEMS FOR RESILIENTLY-SUSPENDED WHEELS.....	21/00
OTHER SUSPENSION ARRANGEMENTS.....	99/00

1/00	<b>Suspensions with rigid connection between axle and frame</b>	3/00	<b>Resilient suspensions for a single wheel</b> (pivoted suspension arms <u>per se</u> , attachment thereof to sprung part of the vehicle, buffer means for limiting movement of arms B60G 7/00; characterised by arrangement, location, or type of springs B60G 11/00)
1/02	• with continuous axle		
1/04	• with divided axle	3/01	• the wheel being mounted for sliding movement, e.g. in or on a vertical guide (camber maintaining means B60G 3/26) [5]

- 3/02 • with a single pivoted arm
- 3/04 • • the arm being essentially transverse to the longitudinal axis of the vehicle
- 3/06 • • • the arm being rigid
- 3/08 • • • • the arm forming the axle housing
- 3/10 • • • the arm itself being resilient, e.g. leaf spring
- 3/12 • • the arm being essentially parallel to the longitudinal axis of the vehicle
- 3/14 • • • the arm being rigid
- 3/16 • • • the arm itself being resilient, e.g. leaf spring
- 3/18 • with two or more pivoted arms, e.g. parallelogram
- 3/20 • • all arms being rigid
- 3/22 • • • a rigid arm forming the axle housing
- 3/24 • • • a rigid arm being formed by the live axle
- 3/26 • • • Means for maintaining substantially-constant wheel camber during suspension movement
- 3/28 • • at least one of the arms itself being resilient, e.g. leaf spring
- 5/00 Resilient suspensions for a set of tandem wheels or axles having interrelated movements**
- 5/01 • the set being characterised by having more than two successive axles [5]
- 5/02 • mounted on a single pivoted arm
- 5/03 • • the arm itself being resilient, e.g. a leafspring (B60G 5/053 takes precedence) [5]
- 5/04 • with two or more pivoted arms, the movements of which are resiliently interrelated
- 5/047 • • at least one arm being resilient, e.g. a leafspring (B60G 5/053 takes precedence) [5]
- 5/053 • • a leafspring being used as equilibration unit between two axle-supporting units [5]
- 5/06 • • the arms turning on a common pivot
- 7/00 Pivoted suspension arms; Accessories thereof** (means for maintaining substantially-constant wheel camber during suspension movement B60G 3/26)
- 7/02 • Attaching arms to sprung part of vehicle
- 7/04 • Buffer means for limiting movement of arms
- 9/00 Resilient suspensions for a rigid axle or axle housing for two or more wheels**
- 9/02 • the axle or housing being pivotally mounted on the vehicle
- 9/04 • the axle or housing not being pivotally mounted on the vehicle
- 11/00 Resilient suspensions characterised by arrangement, location, or kind of springs** (single-wheel suspension by pivoted arm resilient in itself B60G 3/00; adjusting spring characteristic B60G 17/00; springs per se F16F)
- Note(s)**
- In this group, the following terms or expressions are used with the meanings indicated:
  - "torsion bar" includes torsion tube or the like;
  - "rubber" includes synthetic substitutes of a similar nature.
- 11/02 • having leaf springs only
- 11/04 • • arranged substantially parallel to the longitudinal axis of the vehicle
- 11/06 • • arranged obliquely to the longitudinal axis of the vehicle
- 11/08 • • arranged substantially transverse to the longitudinal axis of the vehicle
- 11/10 • • characterised by means specially adapted for attaching the spring to axle or sprung part of the vehicle
- 11/107 • • • Sliding or rolling mountings [5]
- 11/113 • • • Mountings on the axle (B60G 11/107 takes precedence) [5]
- 11/12 • • • Links, pins, or bushes
- 11/14 • having helical, spiral, or coil springs only
- 11/15 • • Coil springs resisting deflection by winding up [5]
- 11/16 • • characterised by means specially adapted for attaching the spring to axle or sprung part of the vehicle
- 11/18 • having torsion-bar springs only
- 11/20 • • characterised by means specially adapted for attaching the spring to axle or sprung part of the vehicle
- 11/22 • having rubber springs only
- 11/23 • • of the torsional-energy-absorption type [5]
- 11/24 • • characterised by means specially adapted for attaching the spring to axle or sprung part of the vehicle
- 11/26 • having fluid springs only, e.g. hydropneumatic springs (B60G 15/12 takes precedence)
- 11/27 • • wherein the fluid is a gas [5]
- 11/28 • • characterised by means specially adapted for attaching the spring to axle or sprung part of the vehicle
- 11/30 • • having pressure fluid accumulator therefor, e.g. accumulator arranged in vehicle frame
- 11/32 • having springs of different kinds
- 11/34 • • including leaf springs
- 11/36 • • • and also helical, spiral, or coil springs
- 11/38 • • • and also rubber springs
- 11/40 • • • • the rubber springs being attached to the axle
- 11/42 • • • • the rubber springs being attached to sprung part of the vehicle
- 11/44 • • • and also torsion-bar springs
- 11/46 • • • and also fluid springs
- 11/48 • • not including leaf springs
- 11/50 • • • having helical, spiral, or coil springs, and also torsion-bar springs
- 11/52 • • • having helical, spiral, or coil springs, and also rubber springs
- 11/54 • • • • with rubber springs arranged within helical, spiral or coil springs
- 11/56 • • • having helical, spiral or coil springs, and also fluid springs
- 11/58 • • • • arranged coaxially
- 11/60 • • • having both rubber springs and torsion-bar springs
- 11/62 • • • having both rubber springs and fluid springs
- 11/64 • • • having both torsion-bar springs and fluid springs
- 13/00 Resilient suspensions characterised by arrangement, location, or type of vibration-dampers** (adjusting damping effect B60G 17/06; vibration-dampers per se F16F)
- 13/02 • having dampers dissipating energy, e.g. frictionally
- 13/04 • • mechanically, e.g. having frictionally-engaging springs as damping elements
- 13/06 • • of fluid type
- 13/08 • • • hydraulic
- 13/10 • • • pneumatic
- 13/12 • • • quasi-fluid, i.e. having powdered medium

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- 13/14 • having dampers accumulating utilisable energy, e.g. compressing air
- 13/16 • having dynamic absorbers as main damping means, i.e. spring-mass system vibrating out of phase
- 13/18 • • combined with energy-absorbing means
- 15/00 Resilient suspensions characterised by arrangement, location, or type of combined spring and vibration-damper, e.g. telescopic type** (combined spring and vibration-dampers *per se* F16F) [5]
  - 15/02 • having mechanical spring
  - 15/04 • • and mechanical damper
  - 15/06 • • and fluid damper
  - 15/07 • • • the damper being connected to the stub axle and the spring being arranged around the damper [5]
  - 15/08 • having fluid spring
  - 15/10 • • and mechanical damper
  - 15/12 • • and fluid damper
  - 15/14 • • • the damper being connected to the stub axle and the spring being arranged around the damper [5]
- 17/00 Resilient suspensions having means for adjusting the spring or vibration-damper characteristics, for regulating the distance between a supporting surface and a sprung part of vehicle or for locking suspension during use to meet varying vehicular or surface conditions, e.g. due to speed or load** [5]
  - 17/005 • Suspension locking arrangements [5]
  - 17/015 • the regulating means comprising electric or electronic elements (B60G 17/005 takes precedence) [5, **2006.01**]
  - 17/016 • • characterised by their responsiveness, when the vehicle is travelling, to specific motion, a specific condition, or driver input [**2006.01**]
  - 17/0165 • • • to an external condition, e.g. rough road surface, side wind [**2006.01**]
  - 17/017 • • characterised by their use when the vehicle is stationary, e.g. during loading, engine start-up or switch-off [**2006.01**]
  - 17/018 • • characterised by the use of a specific signal treatment or control method [**2006.01**]
  - 17/0185 • • • for failure detection [**2006.01**]
  - 17/019 • • characterised by the type of sensor or the arrangement thereof [**2006.01**]
  - 17/0195 • • characterised by the regulation being combined with other vehicle control systems [**2006.01**]
  - 17/02 • Spring characteristics (B60G 17/005-B60G 17/015 take precedence) [5]
  - 17/027 • • Mechanical springs regulated by fluid means (B60G 17/033 takes precedence) [5]
  - 17/033 • • characterised by regulating means acting on more than one spring [5]
- 17/04 • • Fluid-spring characteristics
- 17/044 • • • Self-pumping fluid springs (pumps for liquids F04) [5]
- 17/048 • • • with the regulating means inside the fluid springs (B60G 17/044 takes precedence) [5]
- 17/052 • • • Pneumatic spring characteristics (B60G 17/048 takes precedence) [5]
- 17/056 • • • Regulating distributors or valves (B60G 17/044-B60G 17/048 take precedence) [5]
- 17/06 • Characteristics of dampers (B60G 17/015 takes precedence) [5]
- 17/08 • • Characteristics of fluid dampers (adjusting fluid dampers in general F16F 9/44-F16F 9/53)
- 21/00 Interconnection systems for two or more resiliently-suspended wheels, e.g. for stabilising a vehicle body with respect to acceleration, deceleration or centrifugal forces** (B60G 17/033 takes precedence; steering deflectable wheels combined with means for inwardly inclining the vehicle body on bends B62D 9/02) [5]
  - 21/02 • permanently interconnected
  - 21/04 • • mechanically
  - 21/045 • • • between wheels on different axles on the same side of the vehicle, i.e. the left or the right side [5]
  - 21/05 • • • between wheels on the same axle but on different sides of the vehicle, i.e. the left and right wheel suspensions being interconnected [5]
  - 21/055 • • • • Stabiliser bars [5]
  - 21/06 • • fluid
  - 21/067 • • • between wheels on different axles on the same side of the vehicle, i.e. the left or the right side [5]
  - 21/073 • • • between wheels on the same axle but on different sides of the vehicle, i.e. the left and right wheel suspensions being interconnected [5]
  - 21/08 • characterised by use of gyroscopes (gyroscopes for stabilising vehicle bodies without controlling suspension arrangements B62D 37/06) [**4**, **5**]
  - 21/10 • not permanently interconnected, e.g. operative only on acceleration, only on deceleration, or only at off-straight position of steering
- 23/00 Wheel suspensions with automatic means for sensing unevenness ahead of wheels or for moving wheels up or down in accordance therewith**
- 99/00 Subject matter not provided for in other groups of this subclass** [2010.01]

## B60H ARRANGEMENTS OR ADAPTATIONS OF HEATING, COOLING, VENTILATING, OR OTHER AIR-TREATING DEVICES SPECIALLY FOR PASSENGER OR GOODS SPACES OF VEHICLES

### Note(s)

Attention is drawn to the Note following the title of class B60.

- 1/00 Heating, cooling or ventilating devices** (heating, cooling or ventilating devices providing other air treatment, the other treatment being relevant, B60H 3/00; ventilating solely by opening windows,

doors, roof parts, or the like B60J; heating or ventilating devices for vehicle seats B60N 2/56; vehicle window or windscreen cleaners using air, e.g. defrosters, B60S 1/54) [**4**]



- 1/02 • the heat being derived from the propulsion plant
- 1/03 • • and from a source other than the propulsion plant [4]
- 1/04 • • from cooling liquid of the plant
- 1/06 • • • directly from main radiator
- 1/08 • • • from other radiator than main radiator
- 1/10 • • • • the other radiator being situated in a duct capable of being connected to atmosphere outside vehicle
- 1/12 • • • • • using an air blower
- 1/14 • • otherwise than from cooling liquid of the plant
- 1/16 • • • the air being heated by direct contact with the plant, e.g. air-cooled motor
- 1/18 • • • the air being heated from the plant exhaust gases
- 1/20 • • • • using an intermediate heat-transferring medium
- 1/22 • the heat being derived otherwise than from the propulsion plant
- 1/24 • Devices purely for ventilating or where the heating or cooling is irrelevant (nozzles, air-diffusers B60H 1/34) [4]
- 1/26 • • Ventilating openings in vehicle exterior; Ducts for conveying ventilating air
- 1/28 • • • the openings being situated directly in front of vehicle front window
- 1/30 • • • Air scoops
- 1/32 • Cooling devices (vehicles adapted to transport refrigerated goods B60P 3/20) [4]
- 1/34 • Nozzles; Air-diffusers [4]
- 3/00 Other air-treating devices [4]**
- 3/02 • Moistening
- 3/06 • Filtering

**B60J WINDOWS, WINDSCREENS, NON-FIXED ROOFS, DOORS, OR SIMILAR DEVICES FOR VEHICLES; REMOVABLE EXTERNAL PROTECTIVE COVERINGS SPECIALLY ADAPTED FOR VEHICLES** (fastening, suspending, closing, or opening of such devices E05)

**Note(s)**

1. Windows, windscreens, non-fixed roofs, doors, or similar devices which are of general applicability, irrespective of whether described or claimed only for vehicles, are also classified in subclass E06B.
2. Attention is drawn to the Note following the title of class B60.

- 1/00 Windows; Windscreens; Accessories therefor** (B60J 10/00 takes precedence; air curtains instead of windows B60J 9/04) [4, 5]
- 1/02 • arranged at the vehicle front
- 1/04 • • adjustable
- 1/06 • • • comprising more than one pane
- 1/08 • arranged at vehicle sides
- 1/10 • • fixedly mounted
- 1/12 • • adjustable
- 1/14 • • • with pivotal or rotary movement
- 1/16 • • • slidable
- 1/17 • • • • vertically [2]
- 1/18 • arranged at the vehicle rear
- 1/20 • Accessories, e.g. wind deflectors, blinds (antiglare provisions B60J 3/00; wind deflectors associated with roof openings B60J 7/22; removable external protective coverings for windows or windscreens B60J 11/08; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84) [1, 2006.01]
- 3/00 Antiglare equipment associated with windows or windscreens** (optical viewing arrangements for vehicles B60R 1/00); **Sun visors for vehicles** (sun visors having appliances for stowing or holding personal property B60R 7/05) [2, 5]
- 3/02 • adjustable in position
- 3/04 • adjustable in transparency
- 3/06 • using polarising effect
- 5/00 Doors** (B60J 10/00 takes precedence; window aspects B60J 1/00) [5]
- 5/02 • arranged at the vehicle front
- 5/04 • arranged at the vehicle sides
- 5/06 • • slidable; foldable
- 5/08 • • • of roller-blind type
- 5/10 • arranged at the vehicle rear (B60J 5/04 takes precedence)
- 5/12 • • slidable; foldable
- 5/14 • • • of roller-blind type
- 7/00 Non-fixed roofs; Roofs with movable panels** (B60J 10/00 takes precedence; window aspects B60J 1/00; fixed roofs B62D 25/06; mechanisms for operating wings E05F 11/00, E05F 15/00) [4, 5]
- 7/02 • of sliding type
- 7/04 • • with rigid plate-like element or elements
- 7/043 • • • Sunroofs (B60J 7/047-B60J 7/053 take precedence) [4]
- 7/047 • • • movable to overlapping or nested relationship [4]
- 7/05 • • • pivoting upwardly to vent mode and moving downward before sliding to fully open mode [4]
- 7/053 • • • sliding with final closing motion having vertical component to attain closed and sealed condition [4]
- 7/057 • • • Driving or actuating arrangements (B60J 7/047-B60J 7/053 take precedence) [4]
- 7/06 • • with non-rigid element or elements
- 7/08 • of non-sliding type, i.e. movable or removable roofs or panels, e.g. let-down tops or roofs capable of being easily detached or of assuming a collapsed or inoperative position
- 7/10 • • readily detachable, e.g. tarpaulins with frames, or fastenings for tarpaulins (covering of loads on vehicles by tarpaulins B60P 7/04)
- 7/11 • • • Removable panels, e.g. sunroofs [4]
- 7/12 • • foldable; Tensioning mechanisms therefor, e.g. struts (B60J 7/10 takes precedence)
- 7/14 • • • with a plurality of plate-like elements
- 7/16 • • non-foldable (B60J 7/10 takes precedence)
- 7/185 • Locking arrangements (locks in general E05B) [4]
- 7/19 • • for rigid panels [4]

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7/20	• Vehicle storage compartments for roof parts	11/00	<b>Removable external protective coverings specially adapted for vehicles or parts of vehicles, e.g. parking covers</b> (covering of load on vehicles B60P 7/00; guard strips for body finishing, identifying or decorating B60R 13/04; tents for use as garages E04H 15/00) <b>[1, 2006.01]</b>
7/22	• Wind deflectors for open roofs		
9/00	<b>Devices not provided for in one of main groups B60J 1/00-B60J 7/00</b> (B60J 10/00 takes precedence) <b>[3, 5]</b>		<b>Note(s) [2006.01]</b> In groups B60J 11/02-B60J 11/06, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.
9/02	• Entrance or exit closures other than windows, doors, or in roofs, e.g. emergency escape closures in vehicle bottom	11/02	• Covers wound on rollers <b>[2006.01]</b>
9/04	• Air curtains (in general F24F)	11/04	• for covering at least the roof of the vehicle, e.g. for covering the whole vehicle <b>[2006.01]</b>
10/00	<b>Sealing arrangements</b> (sealings in general F16J 15/00) <b>[5]</b>	11/06	• for covering only specific parts of the vehicle, e.g. for doors (covers or guards for traction couplings, hitches, draw-gear or towing devices B60D 1/60; guards for wheels, radiators or bumpers B60R 19/00) <b>[2006.01]</b>
10/02	• for windows or windscreens <b>[5]</b>	11/08	• • for windows or windscreens (antiglare equipment B60J 3/00) <b>[2006.01]</b>
10/04	• • for sliding window panes, e.g. sash guides <b>[5]</b>	11/10	• • for wheels (hub caps or the like B60B 7/00; external spare wheel stowing, holding or mounting arrangements B62D 43/02) <b>[2006.01]</b>
10/06	• • • for flush-glass windows <b>[5]</b>		
10/08	• for doors <b>[5]</b>		
10/10	• for non-fixed roofs <b>[5]</b>		
10/12	• for movable panels in roofs <b>[5]</b>		

**B60K ARRANGEMENT OR MOUNTING OF PROPULSION UNITS OR OF TRANSMISSIONS IN VEHICLES; ARRANGEMENT OR MOUNTING OF PLURAL DIVERSE PRIME-MOVERS; AUXILIARY DRIVES; INSTRUMENTATION OR DASHBOARDS FOR VEHICLES; ARRANGEMENTS IN CONNECTION WITH COOLING, AIR INTAKE, GAS EXHAUST, OR FUEL SUPPLY, OF PROPULSION UNITS, IN VEHICLES [1, 2006.01]**

Note(s)

- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "auxiliary drives" means drives of auxiliary or external machines or devices from the propulsion unit, transmission, or other parts of the vehicle, and includes the control of such drives;
  - "transmission" means all propulsion parts linking propulsion units, e.g. engines, to ultimate propulsive elements, e.g. wheels.
- Attention is drawn to the Note following the title of class B60.

Subclass index

ARRANGEMENTS OF PROPULSION UNITS	
Electric; steam or gas; internal-combustion or jet-propulsion; plural diverse prime-movers.....	1/00, 3/00, 5/00, 6/00
Motor incorporated in, or adjacent to, traction wheel.....	7/00
Other kinds.....	8/00
Arrangements of control devices.....	26/00
Safety devices.....	28/00
ARRANGEMENT OF TRANSMISSIONS OR OF THEIR CONTROL DEVICES.....17/00, 23/00	
ARRANGEMENT OF CHANGE-SPEED GEARING CONTROL DEVICES.....20/00	
ARRANGEMENT IN CONNECTION WITH COOLING, AIR INTAKE, GAS EXHAUST, OR FUEL SUPPLY, OF PROPULSION UNITS.....11/00, 13/00, 15/00	
ARRANGEMENTS IN CONNECTION WITH POWER SUPPLY FROM FORCE OF NATURE.....16/00	
AUXILIARY DRIVES.....25/00	
KINDS OF CONTROL	
Fittings for automatically controlling vehicle speed.....	31/00
INSTRUMENTATION, DASHBOARDS.....35/00, 37/00	

**Arrangement or mounting of propulsion units in vehicles [2]**

- 1/00 Arrangement or mounting of electrical propulsion units** (B60K 7/00 takes precedence; arrangement or mounting of plural diverse prime-movers for mutual or common propulsion B60K 6/00; electric transmission arrangements B60K 17/12; electric equipment or propulsion of electrically-propelled vehicles *per se* B60L; current-collectors for power supply lines of electrically-propelled vehicles B60L 5/00) [5]
- 1/02 • comprising more than one electric motor
- 1/04 • of the electric storage means for propulsion (for auxiliary purposes only B60R 16/04; supplying batteries to, or removing batteries from, vehicles B60S 5/06) [6]
- 3/00 Arrangement or mounting of steam or gaseous-pressure propulsion units** (B60K 7/00 takes precedence; arrangement or mounting of plural diverse prime-movers for mutual or common propulsion B60K 6/00; gaseous-pressure transmission arrangements B60K 17/10) [5]
- 3/02 • of piston type
- 3/04 • of turbine type
- 5/00 Arrangement or mounting of internal-combustion or jet-propulsion units** (B60K 7/00 takes precedence; arrangement or mounting of plural diverse prime-movers for mutual or common propulsion B60K 6/00) [5]
- 5/02 • with the engine main axis, e.g. crankshaft axis, substantially in, or parallel to, the longitudinal centre line of the vehicle
- 5/04 • with the engine main axis, e.g. crankshaft axis, transversely to the longitudinal centre line of the vehicle
- 5/06 • • with the engine main axis substantially vertical
- 5/08 • comprising more than one engine
- 5/10 • providing for ready detachment of engine
- 5/12 • Arrangement of engine supports
- 6/00 Arrangement or mounting of plural diverse prime-movers for mutual or common propulsion, e.g. hybrid propulsion systems comprising electric motors and internal combustion engines [5, 2007.10]**

**Note(s) [2007.10]**

In this group, the following expressions are used, with the meaning indicated:

- "prime-mover" means a propulsion unit or source of motive power providing a mechanical output, e.g. via a rotating shaft;
- "hybrid electric vehicle" [HEV] means a vehicle having an electric prime-mover and a combustion engine, in which the electrical prime-mover and the combustion engine either singly or in combination, drive the ultimate propulsive elements, e.g. wheels;
- "energy storing means" means apparatus for storing propulsive energy and providing stored energy to drive the prime-mover or the ultimate propulsive elements, e.g. wheels;
- "motor-generator" means an electric machine, such as a motor or a generator, or a mechanical combination thereof, which can provide positive mechanical output force or torque and which can function at other times as an electric generator.

- 6/08 • Prime-movers comprising combustion engines and mechanical or fluid energy storing means [5]
- 6/10 • • by means of a chargeable mechanical accumulator, e.g. flywheel [5]
- 6/12 • • by means of a chargeable fluidic accumulator [5]
- 6/20 • the prime-movers consisting of electric motors and internal combustion engines, e.g. HEVs [2007.10]

**Note(s)**

When classifying in one of groups B60K 6/22, B60K 6/42 or B60K 6/50, further technical information, which is considered to represent information of interest for search, should also be classified in the other subgroups of main group B60K 6/00 to enable searching using a combination of classification symbols.

- 6/22 • • characterised by apparatus, components or means specially adapted for HEVs [2007.10]
- 6/24 • • • characterised by the combustion engines [2007.10]
- 6/26 • • • characterised by the motors or the generators [2007.10]
- 6/28 • • • characterised by the electric energy storing means, e.g. batteries or capacitors [2007.10]
- 6/30 • • • characterised by chargeable mechanical accumulators, e.g. flywheels [2007.10]
- 6/32 • • • characterised by the fuel cells [2007.10]
- 6/34 • • • characterised by the absence of energy storing means [2007.10]
- 6/36 • • • characterised by the transmission gearings [2007.10]
- 6/365 • • • • with the gears having orbital motion [2007.10]
- 6/38 • • • characterised by the driveline clutches (shift clutches within the gearing or transmission B60K 6/36) [2007.10]
- 6/383 • • • • One-way clutches or freewheel devices [2007.10]
- 6/387 • • • • Actuated clutches, i.e. clutches engaged or disengaged by electric, hydraulic or mechanical actuating means [2007.10]
- 6/40 • • • characterised by the assembly or relative disposition of components [2007.10]
- 6/405 • • • • Housings [2007.10]
- 6/42 • • characterised by the architecture of the hybrid electric vehicle [2007.10]
- 6/44 • • • Series-parallel type [2007.10]
- 6/442 • • • • Series-parallel switching type [2007.10]
- 6/445 • • • • Differential gearing distribution type [2007.10]
- 6/448 • • • • Electrical distribution type [2007.10]
- 6/46 • • • Series type [2007.10]
- 6/48 • • • Parallel type [2007.10]
- 6/485 • • • • Motor-assist type [2007.10]
- 6/50 • • Architecture of the driveline characterised by arrangement or kind of transmission units [2007.10]
- 6/52 • • • Driving a plurality of drive axles, e.g. four-wheel drive [2007.10]
- 6/54 • • • Transmission for changing ratio [2007.10]
- 6/543 • • • • the transmission being a continuously variable transmission [2007.10]
- 6/547 • • • • the transmission being a stepped gearing [2007.10]
- 7/00 Disposition of motor in, or adjacent to, traction wheel** (roller-skate driving mechanisms A63C 17/12)

- 8/00 Arrangement or mounting of propulsion units not provided for in one of main groups B60K 1/00-B60K 7/00 [5]

**Arrangements in connection with cooling, air intake, gas exhaust, fuel supply, or power supply of propulsion units in vehicles**

- 11/00 Arrangement in connection with cooling of propulsion units (heating the interior space B60H; cooling internal combustion engines per se F01P)
- 11/02 • with liquid cooling
- 11/04 • • Arrangement or mounting of radiators, radiator shutters, or radiator blinds
- 11/06 • with air cooling
- 11/08 • Air inlets for cooling; Shutters or blinds therefor
- 13/00 Arrangement in connection with combustion air intake or gas exhaust of propulsion units (extensions for melting snow or ice on roads or like surfaces E01H 5/00, E01H 6/00; forming part of the engine F01N; supplying combustion engines with combustible mixtures or constituents F02M)
- 13/02 • concerning intake
- 13/04 • concerning exhaust (exhaust silencers for internal-combustion engines per se F01N)
- 13/06 • using structural parts of the vehicle as ducts, e.g. frame parts
- 15/00 Arrangement in connection with fuel supply of combustion engines; Mounting or construction of fuel tanks (tanks in general B65D, F17C; supplying combustion engines with combustible mixtures or constituents F02M) [5]
- 15/01 • Arrangement of fuel conduits (chassis frame forming fluid conduit means B62D 21/17) [5]
- 15/03 • Fuel tanks (chassis frame comprising fluid storage compartment B62D 21/16) [5]
- 15/035 • • characterised by venting means [5]
- 15/04 • • Tank inlets (B60K 15/077 takes precedence) [5]
- 15/05 • • • Inlet covers [5]
- 15/06 • • characterised by fuel reserve systems [5]
- 15/063 • • Arrangement of tanks [5]
- 15/067 • • • Mounting of tanks [5]
- 15/07 • • • • of gas tanks [5]
- 15/073 • • Tank construction specially adapted to the vehicle (B60K 15/077 takes precedence) [5]
- 15/077 • • with means modifying or controlling distribution or motion of fuel, e.g. to prevent noise, surge, splash or fuel starvation [5]
- 15/10 • concerning gas-producing plants (gas-producing plants per se C10J)
- 16/00 Arrangements in connection with power supply from force of nature, e.g. sun, wind (electric propulsion with power supply from force of nature, e.g. sun, wind, B60L 8/00; effecting propulsion by wind motors driving water-engaging propulsive elements B63H 13/00) [5]

**Arrangement or mounting of transmissions or their control in vehicles**

- 17/00 Arrangement or mounting of transmissions in vehicles (torque-transmitting axles B60B 35/12; combined transmission and steering gear for steering non-deflectable wheels B62D 11/00; clutches per se, e.g. construction thereof, F16D; gearing per se, e.g. construction thereof, F16H) [2]
- 17/02 • characterised by arrangement, location, or kind of clutch
- 17/04 • characterised by arrangement, location, or kind of gearing (electric equipment or propulsion of electrically-propelled vehicles B60L)
- 17/06 • • of change-speed gearing (B60K 17/10-B60K 17/16 take precedence) [2]
- 17/08 • • • of mechanical type
- 17/10 • • of fluid gearing (of fluid clutches B60K 17/02)
- 17/12 • • of electric gearing (of electrically-actuated clutches B60K 17/02)
- 17/14 • • the motor of fluid or electric gearing being disposed in, or adjacent to, traction wheel (B60K 7/00, B60K 17/356 take precedence) [4]
- 17/16 • • of differential gearing
- 17/22 • characterised by arrangement, location, or type of main drive shafting, e.g. cardan shaft
- 17/24 • • Arrangement of mountings for shafting
- 17/26 • characterised by arrangement, location, or type of freewheel device
- 17/28 • characterised by arrangement, location, or type of power take-off
- 17/30 • the ultimate propulsive elements, e.g. ground wheels, being steerable [4]
- 17/32 • the ultimate propulsive elements, e.g. ground wheels, being rockable about a horizontal pivot
- 17/34 • for driving both front and rear wheels, e.g. four wheel drive vehicles (arrangement or mounting of control devices for changing number of driven wheels B60K 23/08)
- 17/342 • • having a longitudinal, endless element, e.g. belt or chain, for transmitting drive to wheels [4]
- 17/344 • • having a transfer gear [4]
- 17/346 • • • the transfer gear being a differential gear [4]
- 17/348 • • having differential means for driving one set of wheels, e.g. the front, at one speed and the other set, e.g. the rear, at a different speeds (B60K 17/346 takes precedence) [4]
- 17/35 • • • including arrangements for suppressing or influencing the power transfer, e.g. viscous clutches (differential gearing with locking devices F16H 48/20) [4, 6]
- 17/354 • • having separate mechanical assemblies for transmitting drive to the front or to the rear wheels or set of wheels [4]
- 17/356 • • having fluid or electric motor, for driving one or more wheels (disposition of motor in, or adjacent to, traction wheel B60K 7/00) [4]
- 17/36 • for driving tandem wheels
- 20/00 Arrangement or mounting of change-speed gearing control devices in vehicles (movable cabs having special adaptations of vehicle control devices B62D 33/073; such control devices per se F16H) [2, 5]
- 20/02 • of initiating means (control mechanisms in general G05G) [2]
- 20/04 • • floor-mounted [2]
- 20/06 • • mounted on steering column or the like [2]
- 20/08 • • dashboard-mounted [2]

23/00	<b>Arrangement or mounting of control devices for vehicle transmissions, or parts thereof, not otherwise provided for</b> (combined transmission and steering gear for steering non-deflectable wheels B62D 11/00; movable cabs having special adaptations of vehicle control devices B62D 33/073; such control devices <u>per se</u> F16D, F16H) [2, 5]
23/02	• for main transmission clutches
23/04	• for differential gearing
23/06	• for freewheel devices
23/08	• for changing number of driven wheels
<hr/>	
25/00	<b>Auxiliary drives</b> (B60K 16/00 takes precedence; arrangement of tyre-inflating pumps mounted on vehicles B60C 23/10; driving engine auxiliaries F02B) [5]
25/02	• directly from an engine shaft
25/04	• from static or dynamic pressure or vacuum, developed by the engine
25/06	• from the transmission power take-off (transmissions having power take-off B60K 17/28)
25/08	• from a ground wheel, e.g. engaging the wheel tread or rim
25/10	• directly from oscillating movements due to vehicle running motion, e.g. suspension movement (resilient suspensions having dampers accumulating utilisable energy, e.g. compressing air, B60G 13/14) [5]
26/00	<b>Arrangement or mounting of propulsion-unit control devices in vehicles</b> (movable cabs having special adaptations of vehicle control devices B62D 33/073) [2, 5]
26/02	• of initiating means or elements [2]
26/04	• of means connecting initiating means or elements to propulsion unit [2]
28/00	<b>Safety devices for propulsion-unit control, specially adapted for, or arranged in, vehicles, e.g. preventing fuel supply or ignition in the event of potentially dangerous conditions</b> (for electrically-propelled vehicles B60L 3/00; road vehicle drive control systems for purposes not related to the control of a particular sub-unit B60W 30/00) [2, 2006.01]
28/02	• responsive to conditions relating to the driver [4]
28/04	• • responsive to presence or absence of the driver, e.g. to weight or lack thereof [4]
28/06	• • responsive to incapacity of driver [4]
28/08	• responsive to conditions relating to the cargo, e.g. overload [4]
28/10	• responsive to conditions relating to the vehicle [4]
28/12	• • responsive to conditions relating to doors or doors locks, e.g. open door [4]
28/14	• • responsive to accident or emergency, e.g. deceleration, tilt of vehicle [4]
28/16	• • responsive to, or preventing, spinning or skidding of wheels (brake control systems for vehicle drive stability B60T 8/1755; arrangements responsive to a speed condition for adjusting wheel braking force B60T 8/32; control of vehicle driving stability otherwise than by controlling the propulsion unit only B60W 30/02; preventing wheel slippage by reducing power in rail vehicles B61C 15/12) [4, 2006.01]

31/00	<b>Vehicle fittings, acting on a single sub-unit only, for automatically controlling vehicle speed, i.e. preventing speed from exceeding an arbitrarily established velocity or maintaining speed at a particular velocity, as selected by the vehicle operator</b> (fittings acting on two or more sub-units B60W 30/14; propulsion-unit control in general, <u>see</u> the relevant classes or subclasses, e.g. F02D; speedometers G01P; systems or devices for controlling speed in general G05D 13/00) [2, 2006.01]
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**Note(s)**

In this group:

- the means ordinarily includes a device, e.g. a servomechanism, for operating a velocity-affecting element of the vehicle, e.g. the throttle;
  - a means for preventing a vehicle from exceeding a particular speed is often referred to as a "governor", whereas a means for maintaining the vehicle within a relatively narrow speed range is generally designated as "speed control". Since these two functions are frequently interrelated, no attempt has been made to identify such means as being particularly adapted to perform only one, or the other of the functions.
- |       |  |
|-------|--|
| 31/02 | • including electrically actuated servomechanism [4]   |
| 31/04 | • • and means for comparing one electrical quantity, e.g. voltage, pulse, waveform, flux, or the like, with another quantity of a like kind, which comparison means is involved in the development of an electrical signal which is fed into the controlling means [4] |
| 31/06 | • including fluid pressure actuated servomechanism [4]   |
| 31/08 | • • and one or more electrical components for establishing or regulating input pressure [4]  |
| 31/10 | • • and means for comparing one electrical quantity, e.g. voltage, pulse, waveform, flux, or the like, with another quantity of a like kind, which comparison means is involved in the development of a pressure which is fed into the controlling means [4]           |
| 31/12 | • including a device responsive to centrifugal force [4]   |

**Note(s)**

1. This subgroup covers also, for example, the pendulum of a curve compensator, i.e. a refinement to the regulating means for automatically adjusting the "set" speed of the means to changes in the course of the roadway along which the vehicle is travelling.
  2. In this subgroup, rotating weights driven at a speed proportional to that of the vehicle's motor presently predominate.
- |       |  |
|-------|--|
| 31/14 | • • having an electrical switch which is caused to function by the centrifugal force [4]                       |
| 31/16 | • having means to prevent or discourage unauthorised use or adjusting of the controlling means [4]             |
| 31/18 | • including a device to audibly, visibly, or otherwise signal the existence of unusual or unintended speed [4] |

**Arrangement or adaptations of instruments specially for vehicles; Dashboards**

35/00	<b>Arrangement or adaptations of instruments</b> (arrangements on dashboard B60K 37/02)
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## B60K

37/00	<b>Dashboards</b> (as road-vehicle superstructure sub-unit B62D)	37/04	• Arrangement of fittings on dashboard (of instruments B60K 37/02)
37/02	• Arrangement of instruments (arrangement of lighting devices for dashboards B60Q 3/04)	37/06	• • of controls, e.g. control knobs

**B60L PROPULSION OF ELECTRICALLY-PROPELLED VEHICLES** (arrangements or mounting of electrical propulsion units or of plural diverse prime-movers for mutual or common propulsion in vehicles B60K 1/00, B60K 6/20; arrangements or mounting of electrical gearing in vehicles B60K 17/12, B60K 17/14; preventing wheel slip by reducing power in rail vehicles B61C 15/08; dynamo-electric machines H02K; control or regulation of electric motors H02P); **SUPPLYING ELECTRIC POWER FOR AUXILIARY EQUIPMENT OF ELECTRICALLY-PROPELLED VEHICLES** (electric coupling devices combined with mechanical couplings of vehicles B60D 1/64; electric heating for vehicles B60H 1/00); **ELECTRODYNAMIC BRAKE SYSTEMS FOR VEHICLES IN GENERAL** (control or regulation of electric motors H02P); **MAGNETIC SUSPENSION OR LEVITATION FOR VEHICLES; MONITORING OPERATING VARIABLES OF ELECTRICALLY-PROPELLED VEHICLES; ELECTRIC SAFETY DEVICES FOR ELECTRICALLY-PROPELLED VEHICLES [4]**

### Subclass index

#### ELECTRIC PROPULSION

With external or internal supply.....	8/00-11/00
For monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles.....	13/00
Control.....	15/00
CURRENT-COLLECTORS.....	5/00
ELECTRIC SUPPLY TO AUXILIARY EQUIPMENT.....	1/00
SAFETY ARRANGEMENTS.....	3/00
ELECTRODYNAMIC BRAKING.....	7/00

<b>1/00</b>	<b>Supplying electric power to auxiliary equipment of electrically-propelled vehicles</b> (arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q) [6]	5/16	• • • Devices for lifting and resetting the collector (B60L 5/34 takes precedence)
1/02	• to electric heating circuits	5/18	• using bow-type collectors in contact with trolley wire
1/04	• • fed by the power supply line	5/19	• • using arrangements for effecting collector movement transverse to the direction of vehicle motion [3]
1/06	• • • using only one supply	5/20	• • Details of contact bow
1/08	• • • Methods or devices for control or regulation	5/22	• • Supporting means for the contact bow
1/10	• • • with provision for using different supplies	5/24	• • Pantographs
1/12	• • • • Methods or devices for control or regulation	5/26	• • • Half-pantographs, e.g. using counter-rocking beams
1/14	• to electric lighting circuits	5/28	• • • Devices for lifting and resetting the collector
1/16	• • fed by the power supply line	5/30	• • • • using springs
<b>3/00</b>	<b>Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption</b>	5/32	• • • • using fluid pressure
3/02	• Dead-man's devices	5/34	• with devices to enable one vehicle to pass another one using the same power supply line
3/04	• Cutting-off the power supply under fault conditions	5/36	• with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
3/06	• Limiting the traction current under mechanical-overload conditions	5/38	• for collecting current from conductor rails (B60L 5/40 takes precedence)
3/08	• Means for preventing excessive speed of the vehicle	5/39	• • from third rail [3]
3/10	• Indicating wheel slip	5/40	• for collecting current from lines in slotted conduits
3/12	• Recording operating variables	5/42	• for collecting current from individual contact pieces connected to the power supply line
<b>5/00</b>	<b>Current-collectors for power supply lines of electrically-propelled vehicles</b>	<b>7/00</b>	<b>Electrodynamic brake systems for vehicles in general [4]</b>
5/02	• with ice-removing device	7/02	• Dynamic electric resistor braking (B60L 7/22 takes precedence)
5/04	• using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)	7/04	• • for vehicles propelled by dc motors
5/06	• • Structure of the rollers or their carrying means	7/06	• • for vehicles propelled by ac motors
5/08	• • Structure of the sliding shoes or their carrying means	7/08	• • Controlling the braking effect (B60L 7/04, B60L 7/06 take precedence)
5/10	• • Devices preventing the collector from jumping off	7/10	• Dynamic electric regenerative braking (B60L 7/22 takes precedence)
5/12	• • Structural features of poles or their bases	7/12	• • for vehicles propelled by dc motors
5/14	• • • Devices for automatic lowering of a jumped-off collector		

- 7/14 • • for vehicles propelled by ac motors
- 7/16 • • for vehicles comprising converters between the power source and the motor
- 7/18 • • Controlling the braking effect (B60L 7/12, B60L 7/14, B60L 7/16 take precedence)
- 7/20 • Braking by supplying regenerated power to the prime mover of vehicles comprising engine-driven generators
- 7/22 • Dynamic electric resistor braking, combined with dynamic electric regenerative braking
- 7/24 • with additional mechanical or electromagnetic braking
- 7/26 • • Controlling the braking effect
- 7/28 • Eddy-current braking
- 8/00 Electric propulsion with power supply from force of nature, e.g. sun, wind [5]**
- 9/00 Electric propulsion with power supply external to vehicle (B60L 8/00, B60L 13/00 take precedence) [5, 6]**
  - 9/02 • using dc motors
  - 9/04 • • fed from dc supply lines
  - 9/06 • • • with conversion by metadyne
  - 9/08 • • fed from ac supply lines
  - 9/10 • • • with rotary converters
  - 9/12 • • • with static converters
  - 9/14 • • fed from different kinds of power supply lines
  - 9/16 • using ac induction motors
  - 9/18 • • fed from dc supply lines
  - 9/20 • • • single-phase motors
  - 9/22 • • • polyphase motors
  - 9/24 • • fed from ac supply lines
  - 9/26 • • • single-phase motors
  - 9/28 • • • polyphase motors
  - 9/30 • • fed from different kinds of power supply lines
  - 9/32 • using ac brush-displacement motors
- 11/00 Electric propulsion with power supplied within the vehicle (B60L 8/00, B60L 13/00 take precedence; arrangements or mounting of prime-movers consisting of electric motors and internal combustion engines for mutual or common propulsion B60K 6/20) [5, 6, 2006.01]**
  - 11/02 • using engine-driven generators
  - 11/04 • • using dc generators and motors
  - 11/06 • • using ac generators and dc motors
  - 11/08 • • using ac generators and motors
  - 11/10 • • using dc generators and ac motors
  - 11/12 • • with additional electric power supply, e.g. accumulator
  - 11/14 • • with provision for direct mechanical propulsion
  - 11/16 • using power stored mechanically, e.g. in flywheel
  - 11/18 • using power supplied from primary cells, secondary cells, or fuel cells
- 13/00 Electric propulsion for monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles [4, 6]**
- 13/03 • Electric propulsion by linear motors [6]
- 13/04 • Magnetic suspension or levitation for vehicles [4]
- 13/06 • • Means to sense or control vehicle position or attitude with respect to railway [4]
- 13/08 • • • for the lateral position [4]
- 13/10 • Combination of electric propulsion and magnetic suspension or levitation [4]
- 15/00 Methods, circuits or devices for controlling the propulsion of electrically-propelled vehicles, e.g. their traction-motor speed, to achieve a desired performance; Adaptation of control equipment on electrically-propelled vehicles for remote actuation from a stationary place, from alternative parts of the vehicle or from alternative vehicles of the same vehicle train**
  - 15/02 • characterised by the form of the current used in the control circuit
  - 15/04 • • using dc
  - 15/06 • • using substantially-sinusoidal ac
  - 15/08 • • using pulses
  - 15/10 • for automatic control superimposed on human control to limit the acceleration of the vehicle, e.g. to prevent excessive motor current (electric devices for safety purposes B60L 3/00)
  - 15/12 • • with circuits controlled by relays or contactors
  - 15/14 • • with main controller driven by a servomotor (B60L 15/18 takes precedence)
  - 15/16 • • with main controller driven through a ratchet mechanism (B60L 15/18 takes precedence)
  - 15/18 • • without contact-making and breaking, e.g. using a transducer
  - 15/20 • for control of the vehicle or its driving motor to achieve a desired performance, e.g. speed, torque, programmed variation of speed
  - 15/22 • • with sequential operation of interdependent switches, e.g. relays, contactors, programme drum
  - 15/24 • • with main controller driven by a servomotor (B60L 15/28 takes precedence)
  - 15/26 • • with main controller driven through a ratchet mechanism (B60L 15/28 takes precedence)
  - 15/28 • • without contact-making and breaking, e.g. using a transducer
  - 15/30 • • with means to change-over to human control
  - 15/32 • Control or regulation of multiple-unit electrically-propelled vehicles
  - 15/34 • • with human control of a setting device
  - 15/36 • • • with automatic control superimposed, e.g. to prevent excessive motor current
  - 15/38 • • with automatic control
  - 15/40 • Adaptation of control equipment on vehicle for remote actuation from a stationary place (devices along the route for controlling devices on rail vehicles B61L 3/00; central rail-traffic control systems B61L 27/00)
  - 15/42 • Adaptation of control equipment on vehicle for actuation from alternative parts of the vehicle or from alternative vehicles of the same vehicle train (B60L 15/32 takes precedence)

## B60L

**B60M POWER SUPPLY LINES, OR DEVICES ALONG RAILS, FOR ELECTRICALLY-PROPELLED VEHICLES** (control of points or safety arrangements along railway lines B61L; construction of rails or points in general E01B)

### Note(s)

This subclass covers:

- overhead, overground, or underground power-supply lines; their crossings and points, erection and supervision;
- devices along rails and rail joints, for current-conduction and for insulation;
- safety devices along the route against earth currents and inductive interference with nearby communication lines.

<b>1/00</b>	<b>Power supply lines for contact with collector on vehicle</b> (collectors therefor B60L 5/00)	1/26	• • Compensation means for variation in length
1/02	• Details	1/28	• • Manufacturing or repairing trolley lines (scaffold cars B60P, B61D 15/00; platforms therefor B66F 11/04; manufacturing conductors in general H01B 13/00; overhead lines in general H02G 1/00)
1/04	• • Mechanical protection of line; Protection against contact by living beings	1/30	• Power rails
1/06	• • Arrangements along the power lines for reducing interference in nearby communication lines (in general H04B 15/02)	1/32	• • Crossings; Points (B60M 1/34 takes precedence)
1/08	• • Arrangements for energising and de-energising power line sections using mechanical actuation by the passing vehicle	1/34	• • in slotted conduits
1/10	• • Arrangements for energising and de-energising power line sections using magnetic actuation by the passing vehicle	1/36	• Single contact pieces along the line for power supply
1/12	• Trolley lines; Accessories therefor	<b>3/00</b>	<b>Feeding power to the supply lines in contact with collector on vehicles; Arrangements for consuming regenerative power</b> (controlling rail vehicles by varying voltage of power fed to vehicle B60L; power distribution in general H02J)
1/13	• • Trolley wires	3/02	• with means for maintaining voltage within a predetermined range (in general G05F)
1/14	• • Crossings; Points	3/04	• Arrangements for cutting-in and -out of individual track sections (by passage of the vehicle B60M 1/10)
1/16	• • Suspension insulators (in general H01B)	3/06	• Arrangements for consuming regenerative power
1/18	• • Section insulators; Section switches	<b>5/00</b>	<b>Arrangements along running rails or at joints thereof for current-conduction or insulation, e.g. safety devices for reducing earth currents</b> (insulating rail joints E01B 11/54; conductive connections between rails in general H01R 4/00, e.g. H01R 4/64)
1/20	• • Arrangements for supporting or suspending trolley wires, e.g. from buildings	5/02	• Means for reducing potential difference between rail and adjacent ground
1/22	• • • Separate lines from which power lines are suspended, e.g. catenary lines, supporting-lines under tension	<b>7/00</b>	<b>Power lines or rails specially adapted for electrically-propelled vehicles of special types, e.g. suspension tramway, ropeway, underground railway</b>
1/225	• • • Arrangements for fixing trolley wires to supporting-lines which are under tension		
1/23	• • • Arrangements for suspending trolley wires from catenary line		
1/234	• • • incorporating yielding means or damping means (supporting wires B60M 1/22)		
1/24	• • • Clamps; Splicers; Anchor tips		

**B60N VEHICLE PASSENGER ACCOMMODATION NOT OTHERWISE PROVIDED FOR** (furniture construction A47)

### Note(s)

Attention is drawn to the Note following the title of class B60.

<b>2/00</b>	<b>Seats specially adapted for vehicles; Arrangement or mounting of seats in vehicles</b> (for facilitating access of patients or disabled persons to, or exit from, vehicles A61G 3/02; railway seats B61D 33/00; cycle seats B62J 1/00; aircraft seats B64D 11/06, B64D 25/04, B64D 25/10) [5]	2/07	• • • • Slide construction [7]
2/005	• Arrangement or mounting of seats in vehicles (B60N 2/02 takes precedence) [7]	2/075	• • • • roller-less [7]
2/01	• • Arrangement of seats relative to one another [7]	2/08	• • • characterised by the locking device [5]
2/015	• • Attaching seats directly to vehicle chassis [7]	2/10	• • • tiltable (B60N 2/12 takes precedence) [5]
2/02	• the seat or part thereof being movable, e.g. adjustable (adjustable arm-rests B60N 2/46; adjustable head-rest B60N 2/48) [5]	2/12	• • • slidable and tiltable [5]
2/04	• • the whole seat being movable [5]	2/14	• • • rotatable, e.g. to permit easy access (B60N 2/10 takes precedence) [5]
2/06	• • • slidable (B60N 2/12 takes precedence) [5]	2/16	• • • height-adjustable [5]
		2/18	• • • • the front or the rear portion of the seat being adjustable, e.g. independently of each other [5]
		2/20	• • the back-rest being tiltable, e.g. to permit easy access (B60N 2/04, B60N 2/22 take precedence) [5]



- 2/22 • • the back-rest being adjustable [5]
- 2/225 • • • by cycloidal or planetary mechanisms [7]
- 2/23 • • • by linear screw mechanisms [7]
- 2/235 • • • by gear-pawl type mechanisms [7]
- 2/24 • for particular purposes or particular vehicles [5]
- 2/26 • • for children (B60N 2/30 takes precedence) [5]
- 2/28 • • • Seats readily mountable on, and dismountable from, existing seats of the vehicle [5]
- 2/30 • • Non-dismountable seats storable in a non-use position, e.g. foldable spare seats (convertible for other use B60N 2/32) [5]
- 2/32 • • convertible for other use [5]
- 2/34 • • • into a bed (sleeping arrangements in caravans B60P 3/38) [5]
- 2/36 • • • into a loading platform [5]
- 2/38 • • specially constructed for use on tractors or like off-road vehicles [5]
- 2/39 • • • Seats tiltable to compensate for roll inclination of vehicles [7]
- 2/40 • • • saddle type [5]
- 2/42 • • the seat constructed to protect the occupant from the effect of abnormal g-forces, e.g. crash or safety seats (B60N 2/26, B60N 2/46, B60N 2/48 take precedence) [5]
- 2/427 • • • Seats or parts thereof displaced during a crash [7]
- 2/433 • • • Safety locks for back-rests, e.g. with locking bars activated by inertia [7]
- 2/44 • Details or parts not otherwise provided for [5]
- 2/46 • • Arm-rests [5]
- 2/48 • • Head-rests [5]
- 2/50 • • Seat suspension devices [5]
- 2/52 • • • using fluid means [5]
- 2/54 • • • using mechanical springs [5]
- 2/56 • • Heating or ventilating devices [7]
- 2/58 • • Seat coverings [7]
- 2/60 • • • Removable protective coverings [7]
- 2/62 • • Thigh-rests [7]
- 2/64 • • Back-rests [7]
- 2/66 • • • Lumbar supports [7]
- 2/68 • • Seat frames, e.g. for the back-rest [7]
- 2/70 • • Upholstery springs [7]
- 2/72 • • • Attachment or adjustment thereof [7]
- 3/00 Arrangements or adaptations of other passenger fittings, not otherwise provided for** (of radio sets, television sets, telephones, safety belts, or the like B60R)
- 3/02 • of hand grips or straps
- 3/04 • of floor mats
- 3/06 • of footrests (floors of road vehicles B62D)
- 3/08 • of receptacles for refuse, e.g. ash-trays (ash-trays per se A24F)
- 3/10 • of receptacles for food or beverages, e.g. refrigerated (picnic sets A45F)
- 3/12 • of receptacles for cigarettes or the like (receptacles for cigarettes or the like A24F)
- 3/14 • of electrically-heated lighters
- 3/16 • of cooking or boiling devices (cooking or boiling devices per se A47, F24C)
- 3/18 • of drinking-water dispensing devices
- 5/00 Arrangements or devices on vehicles for entrance or exit control of passengers, e.g. turnstiles** (turnstiles in general E06B 11/08) [2]
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**B60P VEHICLES ADAPTED FOR LOAD TRANSPORTATION OR TO TRANSPORT, TO CARRY, OR TO COMPRISE SPECIAL LOADS OR OBJECTS** (vehicles with special provisions for transporting patients or disabled persons, or their personal conveyances A61G 3/00)

#### Note(s)

Attention is drawn to the Note following the title of class B60.

- 1/00 Vehicles predominantly for transporting loads and modified to facilitate loading, consolidating the load, or unloading** (vehicles for carrying harvested crops with means for self-loading or self-unloading A01D 90/00; peculiar to refuse-collecting-vehicles B65F; loading or unloading vehicles by means not incorporated therein B65G)
- 1/02 • with parallel up-and-down movement of load supporting or containing element (in combination with tipping B60P 1/34; devices for lifting or lowering bulky or heavy goods for loading or unloading purposes, movable on wheels or the like, e.g. fork-lift trucks, B66F 9/06)
- 1/04 • with a tipping movement of load supporting or containing element (dredges or soil-shifting machines E02F 3/00)
- 1/06 • • actuated by mechanical gearing only
- 1/08 • • • with relative displacement of the wheel axles
- 1/10 • • • with screw and nut
- 1/12 • • • with toothed gears, wheels, or sectors; with links, cams and rollers, or the like
- 1/14 • • • with cables, chains, or the like
- 1/16 • • actuated by fluid-operated mechanisms
- 1/18 • • • with relative displacement of the wheel axles
- 1/20 • • • with toothed gears, wheels, or sectors; with links, cams and rollers, or the like
- 1/22 • • • with cables, chains, or the like
- 1/24 • • using the weight of the load
- 1/26 • • Means for controlling movement of tailboards or sideboards [5]
- 1/267 • • • Controlling degree of tailboard or sideboard movement in dependence upon degree of tipping movement, e.g. by linkage or cam [5]
- 1/273 • • • Providing interdependence between tipping movement and the latching or unlatching of a freely-swingable tailboard or sideboard [5]
- 1/28 • • Tipping-body constructions
- 1/30 • • in combination with another movement of the element
- 1/32 • • • the other movement being lateral displacement
- 1/34 • • • the other movement being raising or lowering
- 1/36 • using endless chains or belts thereon

- 1/38 • • forming the main load supporting or containing element or part thereof
- 1/40 • using screw conveyers thereon
- 1/42 • • mounted on the load supporting or containing element
- 1/43 • using a loading ramp mounted on the vehicle (loading ramps *per se* B65G 69/28) [5]
- 1/44 • having a loading platform thereon raising the load to the level of the load supporting or containing element
- 1/46 • • carried in vertical guides
- 1/48 • using pivoted arms raisable above the load supporting or containing element (load-engaging elements B66)
- 1/50 • • loading from in front of the vehicle
- 1/52 • using rollers in the load supporting or containing element
- 1/54 • using cranes for self-loading or self-unloading (vehicles for transporting cranes B60P 3/28; mobile or travelling cranes B66C)
- 1/56 • the load supporting or containing element having bottom discharging openings
- 1/58 • using vibratory effect
- 1/60 • using fluids, e.g. having direct contact between fluid and load [2]
- 1/62 • • with porous walls
- 1/64 • the load supporting or containing element being readily removable (caravans, camping, or the like vehicles characterised by living accommodation in the form of a removable body supported by the vehicle unit B60P 3/33, B60P 3/345) [5]
- 3/00 Vehicles adapted to transport, to carry or to comprise special loads or objects** (ambulances or other vehicles with special provisions for transporting patients or disabled persons, or their personal conveyances A61G 3/00; hearses A61G 21/00; fire-fighting land vehicles A62C 27/00; refuse-collecting vehicles B65F 3/00, B65F 7/00; snow-removing vehicles E01H; armoured or armed vehicles F41H 7/00; self-propelled mine-clearing vehicles F41H 11/16)
- 3/022 • for transporting prefabricated buildings or modules thereof, e.g. prefabricated garages or the like (conveying or assembling building elements E04G 21/14) [5]
- 3/025 • the object being a shop, cafeteria or display (the object being a workshop B60P 3/14) [3]
- 3/03 • for transporting money or other valuables [3]
- 3/035 • for transporting reel units [3]
- 3/04 • for transporting animals
- 3/05 • for transporting meat (for transporting refrigerated goods B60P 3/20) [3]
- 3/055 • for transporting bottles [3]
- 3/06 • for carrying vehicles (B60P 3/12 takes precedence; caravans, camping, or like vehicles with vehicle-carrying means B60P 3/363) [3, 5]
- 3/07 • • for carrying road vehicles [3]
- 3/071 • • • Arrangement of overturned or on-edge vehicles [5]
- 3/073 • • • Vehicle retainers [5]
- 3/075 • • • • for wheels, hubs, or axle shafts [5]
- 3/077 • • • • Wheel cradles, chocks, or wells [5]
- 3/079 • • • • Tie-downs (B60P 3/075 takes precedence) [5]
- 3/08 • • • Multilevel-deck construction carrying vehicles [3]
- 3/10 • • for carrying boats
- 3/11 • • for carrying aircraft [3]
- 3/12 • for salvaging damaged vehicles
- 3/14 • the object being a workshop for servicing, for maintenance, or for carrying workmen during work (lifting devices for movable platforms or cabins for workmen B66F 11/04)
- 3/16 • for carrying mixed concrete, e.g. having rotatable drums
- 3/18 • the object being a searchlight
- 3/20 • for transporting refrigerated goods (air treatment of goods space B60H)
- 3/22 • Tank vehicles (tank aspects B65D 88/00, B65D 90/00, F17C)
- 3/24 • • compartmented
- 3/28 • for transporting cranes (vehicles using cranes for self-loading or self-unloading B60P 1/54; mobile or travelling cranes B66C)
- 3/30 • Spraying-vehicles (sprinkling-wagons for fertilising liquid A01C 23/00; for destruction of noxious animals, vermin, or unwanted vegetation A01M; for spraying asphalt, bitumen, tar, or the like E01C; for cleaning streets E01H)
- 3/32 • comprising living accommodation for people, e.g. caravans, camping, or like vehicles (tents or canopies, in general E04H 15/00)
- 3/325 • • the living accommodation being neither expansible nor collapsible nor capable of rearrangement [5]
- 3/33 • • • characterised by living accommodation in the form of a removable body supported by the vehicle unit [5]
- 3/335 • • • supported by a trailer-type vehicle or being itself of the trailer-type (B60P 3/33 takes precedence) [5]
- 3/34 • • the living accommodation being expansible, collapsible or capable of rearrangement (B60P 3/39 takes precedence; tents supported at least partially by vehicles E04H 15/06) [5]
- 3/345 • • • characterised by living accommodation in the form of a removable body supported by the vehicle unit [5]
- 3/35 • • • supported by a trailer-type vehicle or being itself of the trailer-type (B60P 3/345 takes precedence) [5]
- 3/355 • • • • collapsible to a condition not usable as living accommodation, e.g. to a trailer of compact design [5]
- 3/36 • • Auxiliary arrangements; Arrangements of living accommodation (toilet or washing arrangements B60R 15/00); Details [5]
- 3/363 • • • with vehicle-carrying means [5]
- 3/367 • • • • with boat-carrying means [5]
- 3/37 • • • Exterior platforms, e.g. porch (awnings for buildings E04F 10/00; trailer awnings E04H 15/08; awnings for tents E04H 15/58) [5]
- 3/373 • • • Passageways between living accommodation and vehicle operating compartment [5]
- 3/377 • • • Means for securing living accommodation to vehicle unit [5]
- 3/38 • • • Sleeping arrangements
- 3/39 • • • • expansible, collapsible or repositionable elements adapted to support a bed, e.g. wall portions [5]
- 3/40 • for carrying long loads, e.g. with separate wheeled load-supporting elements (B60P 3/022 takes precedence; signal devices to be attached to overhanging load B60Q 7/02) [5]
- 3/41 • • for log transport [6]

- 3/42 • convertible from one use to a different one (vehicles capable of travelling in or on different media, rail-and-road vehicles B60F)
- 5/00 Arrangements of weighing machines on vehicles** (adapting weighing machines to use on transport vehicles G01G 19/08)
- 7/00 Securing or covering of load on vehicles**
- 7/02 • Covering of load
- 7/04 • • by tarpaulins or like flexible members
- 7/06 • Securing of load (vehicle retainers B60P 3/073) [5]
- 7/08 • • Securing to vehicle floor or sides (B60P 7/13, B60P 7/135 take precedence) [3, 5]
- 7/10 • • • the load being plates, cases, or boxes
- 7/12 • • • the load being tree-trunks, beams, drums, tubes, or the like
- 7/13 • • Securing freight containers or forwarding containers on vehicles [3]
- 7/135 • • Securing or supporting by load bracing means [5]
- 7/14 • • • the load bracing means comprising a movable bulkhead
- 7/15 • • • the load bracing means comprising a movable bar [5]
- 7/16 • • Protecting against shocks
- 7/18 • • • Protecting freight containers or forwarding containers [3]
- 9/00 Other vehicles predominantly for carrying loads**

**B60Q ARRANGEMENT OF SIGNALLING OR LIGHTING DEVICES, THE MOUNTING OR SUPPORTING THEREOF OR CIRCUITS THEREFOR, FOR VEHICLES IN GENERAL** (arrangement of signalling or lighting devices, the mounting or supporting thereof, for rail vehicles B61D, for cycles B62J, for ships B63B, for aircraft B64D; lighting in general, lighting devices per se F21, H05B; signalling in general G08; electric switches per se H01H) [4]

#### Note(s)

1. This subclass covers also arrangement or adaptation of lighting switches or signal-initiating means for vehicles.
2. Attention is drawn to the Note following the title of class B60.

#### Subclass index

##### LIGHTING

Interior.....	3/00
Other.....	1/00

##### SIGNALLING

Visual.....	1/00
Acoustic.....	5/00
Portable emergency devices.....	7/00
Other.....	9/00, 11/00

- 1/00 Arrangement of optical signalling or lighting devices, the mounting or supporting thereof or circuits therefor** (for lighting vehicle interior B60Q 3/00) [4]
- 1/02 • the devices being primarily intended to illuminate the way ahead or to illuminate other areas of way or environments
- 1/04 • • the devices being headlights
- 1/05 • • • retractable [5]
- 1/06 • • • adjustable, e.g. remotely-controlled from inside vehicle (B60Q 1/05 takes precedence) [5]
- 1/064 • • • • by fluid means [5]
- 1/068 • • • • by mechanical means [5]
- 1/072 • • • • • comprising a flexible element, e.g. chain [5]
- 1/076 • • • • • by electric means [5]
- 1/08 • • • • • automatically
- 1/10 • • • • • due to vehicle inclination, e.g. due to load distribution
- 1/105 • • • • • • by fluid means [5]
- 1/11 • • • • • • by mechanical means [5]
- 1/115 • • • • • • by electric means [5]
- 1/12 • • • • • • due to steering position
- 1/124 • • • • • • by mechanical means [5]
- 1/128 • • • • • • • comprising a flexible element, e.g. chain [5]
- 1/132 • • • • • • • comprising meshing gear elements [5]
- 1/136 • • • • • • • comprising rigid link elements [5]
- 1/14 • • • having dimming means
- 1/16 • • • illuminating the way asymmetrically
- 1/18 • • • being additional front lights
- 1/20 • • • • Fog lights
- 1/22 • • for reverse drive
- 1/24 • • for lighting other areas than only the way ahead
- 1/26 • the devices being primarily intended to indicate the vehicle, or parts thereof, or to give signals, to other traffic
- 1/28 • • for indicating front of vehicle
- 1/30 • • for indicating rear of vehicle, e.g. by means of reflecting surfaces
- 1/32 • • for indicating vehicle sides
- 1/34 • • for indicating change of drive direction (B60Q 1/22 takes precedence)
- 1/36 • • • using movable members, e.g. arms with built-in flashing lamps
- 1/38 • • • using immovably-mounted light sources, e.g. fixed flashing lamps
- 1/40 • • • having automatic return to inoperative position
- 1/42 • • • • due to steering-wheel position
- 1/44 • • for indicating braking action
- 1/46 • • for giving flashing caution signals during drive, other than signalling change of direction, e.g. flashing the headlights
- 1/48 • • for parking purposes

## B60Q

- 1/50 • • for indicating other intentions or conditions, e.g. request for waiting or overtaking
- 1/52 • • • for indicating emergencies
- 1/54 • • • for indicating speed
- 1/56 • • for illuminating registrations or the like

### 3/00 Arrangement of lighting devices for vehicle interior, the mounting or supporting thereof or circuits therefor [4]

- 3/02 • for lighting passenger or driving compartment
- 3/04 • • for dashboard
- 3/06 • for lighting compartments other than passenger or driving space, e.g. luggage or engine compartment

### 5/00 Arrangement or adaptation of acoustic signal devices

### 7/00 Arrangement or adaptation of portable emergency signal devices on vehicles (arrangements for enforcing caution on roads, e.g. marker posts, E01F 9/00; signs G09F, e.g. reflecting warning triangles G09F 13/16)

- 7/02 • to be attached to overhanging loads or extending parts of vehicle

### 9/00 Arrangement or adaptation of signal devices not provided for in one of main groups B60Q 1/00-B60Q 7/00

### 11/00 Arrangement of monitoring devices for devices provided for in groups B60Q 1/00-B60Q 9/00 [2]

**B60R VEHICLES, VEHICLE FITTINGS, OR VEHICLE PARTS, NOT OTHERWISE PROVIDED FOR** (fire prevention, containment or extinguishing specially adapted for vehicles A62C 3/07)

## Note(s)

Attention is drawn to the Note following the title of class B60.

## Subclass index

VEHICLES OR VEHICLE PARTS OR ACCESSORIES NOT OTHERWISE PROVIDED FOR.....	16/00, 99/00
ARRANGEMENTS	
Of optical viewing means.....	1/00
Of steps or ladders.....	3/00
ARRANGEMENTS OR ADAPTATIONS	
Of electric installations not otherwise provided for; of sanitation devices.....	16/00, 15/00
For advertising.....	13/00
Of lubricating systems or devices.....	17/00
ARRANGEMENTS OF FITTINGS FOR HOLDING OR CARRYING LUGGAGE OR OTHER ARTICLES.....	5/00-11/00
PROTECTION OR SECURITY	
Arrangements concerning the vehicle or passengers; safety belts or body harnesses; anti- theft arrangements.....	19/00, 21/00, 22/00, 25/00
BODY-FINISHING ELEMENTS.....	13/00
OTHER VEHICLE FITTINGS.....	99/00

### 1/00 Optical viewing arrangements (antiglare equipment, e.g. polarising, for windscreens or windows B60J 3/00; devices *per se* G02B; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84) [2]

- 1/02 • Rear-view mirror arrangements (periscope arrangements B60R 1/10)
- 1/04 • • mounted inside vehicle (B60R 1/08 takes precedence) [1, 7]
- 1/06 • • mounted on vehicle exterior (B60R 1/08 takes precedence) [1, 7]
- 1/062 • • • with remote control for adjusting position [7]
- 1/064 • • • • by manually powered actuator [7]
- 1/066 • • • • • for adjusting the mirror relative to its housing [7]
- 1/068 • • • • • • using cables [7]
- 1/07 • • • • • by electrically powered actuator [7]
- 1/072 • • • • • • for adjusting the mirror relative to its housing [7]
- 1/074 • • • • • • for retracting the mirror arrangements to a non-use position alongside the vehicle [7]
- 1/076 • • • yieldable to excessive external force and provided with an indexed use position (B60R 1/062 takes precedence) [7]

- 1/078 • • • easily removable; mounted for bodily outward movement, e.g. when towing [7]

- 1/08 • • involving special optical features, e.g. avoiding blind spots

- 1/10 • Front-view mirror arrangements; Periscope arrangements

- 1/12 • Mirror assemblies combined with other articles, e.g. clocks

### 3/00 Arrangements of steps, e.g. running-boards (constructed as superstructure sub-units of road vehicles B62D; ladders E06C)

- 3/02 • Retractable steps
- 3/04 • with provisions for shoe-scraping

### 5/00 Compartments within vehicle body primarily intended or sufficiently spacious for trunks, suit-cases, or the like (primarily intended for stowing loads in load-transporting vehicles B60P; arrangements for stowing spare wheels B62D 43/00)

- 5/02 • arranged at front of vehicle
- 5/04 • arranged at rear of vehicle

7/00	<b>Stowing or holding appliances inside of vehicle primarily intended for personal property smaller than suit-cases, e.g. travelling articles, or maps</b> (for radio sets, television sets, telephones, or the like, mounting of cameras operative during drive, tools, or spare parts B60R 11/00; for receptacles for refuse, food, beverages, cigarettes B60N)	13/07	• Water drainage or guide means not integral with roof structure (B60R 13/06 takes precedence; water deflectors for bonnets or lids B62D 25/13) [4]
7/02	• in a separate luggage compartment	13/08	• Insulating elements, e.g. for sound insulation [4]
7/04	• in driver or passenger space	13/10	• Registration, licensing, or like devices
7/05	• • mounted on sun visor [5]	15/00	<b>Arrangements or adaptations of sanitation devices</b>
7/06	• • mounted on or below dashboards	15/02	• Washing facilities
7/08	• Disposition of racks, clips, or the like	15/04	• Toilet facilities
7/10	• • for supporting hats, clothes or clothes hangers [5]	16/00	<b>Electric or fluid circuits specially adapted for vehicles and not otherwise provided for; Arrangement of elements of electric or fluid circuits specially adapted for vehicles and not otherwise provided for [3]</b>
7/12	• • for supporting umbrellas [5]	16/02	• electric [3]
7/14	• • for supporting weapons [5]	16/023	• • for transmission of signals between vehicle parts or subsystems [2006.01]
9/00	<b>Supplementary fittings on vehicle exterior for carrying loads, e.g. luggage, sports gear or the like [5]</b>	16/027	• • • between relatively movable parts of the vehicle, e.g. between steering wheel and column [2006.01]
9/02	• at the sides, e.g. on running-board	16/03	• • for supply of electrical power to vehicle subsystems [2006.01]
9/04	• Carriers associated with vehicle roof (B60R 9/08 takes precedence) [5]	16/033	• • • characterised by the use of electrical cells or batteries (for propulsion purposes B60K 1/04; supplying batteries to, or removing batteries from, vehicles B60S 5/06; testing of charge state G01R 31/36) [2006.01]
9/042	• • Carriers characterised by means to facilitate loading or unloading of the load, e.g. rollers, tracks, or the like [5]	16/037	• • for occupant comfort [2006.01]
9/045	• • Carriers being adjustable or transformable, e.g. expansible, collapsible [5]	16/04	• • Arrangement of batteries [3, 6, 2006.01]
9/048	• • Carriers characterised by article-gripping, -retaining, or -locking means [5]	16/06	• • for carrying-off electrostatic charges [3]
9/05	• • Carriers characterised by wind deflecting means (wind deflectors for open roofs B60J 7/22) [5]	16/08	• fluid [3]
9/052	• • Carriers comprising elongate members extending only transversely of vehicle (B60R 9/08 takes precedence) [5]	17/00	<b>Arrangements or adaptations of lubricating systems or devices</b> (lubricating in general F16N)
9/055	• • Enclosure-type carriers, e.g. containers, boxes (B60R 9/048 takes precedence) [5]	17/02	• Systems, e.g. central lubrication systems
9/058	• • characterised by releasable attaching means between carrier and roof [5]	19/00	<b>Wheel guards; Radiator guards; Obstruction removers; Fittings damping bouncing force in collisions</b> (mudguards B62D)
9/06	• at vehicle front or rear	19/02	• Bumpers, i.e. impact receiving or absorbing members for protecting vehicles or fending off blows from other vehicles or objects (initiating brake action by contact of bumper with an external object B60T 7/22; for rail vehicles B61F 19/04; safety equipment for cycles B62J 27/00; integral with waterborne vessels or specially adapted therefor B63B 59/02) [4]
9/08	• specially adapted for sports gear (vehicles specially adapted for carrying aeroplanes, for carrying boats B60P)	19/03	• • characterised by material, e.g. composite (B60R 19/18 takes precedence) [4]
9/10	• • for cycles	19/04	• • formed from more than one section (B60R 19/18 takes precedence) [4]
9/12	• • for skis	19/12	• • • vertically spaced [4]
11/00	<b>Arrangements for holding or mounting articles, not otherwise provided for</b>	19/14	• • • having folding parts [4]
11/02	• for radio sets, television sets, telephones, or the like; Arrangement of controls thereof (of aerials H01Q)	19/16	• • • having deflecting members, e.g. rollers, balls [4]
11/04	• Mounting of cameras operative during drive; Arrangement of controls thereof relative to the vehicle (cameras <u>per se</u> G03B)	19/18	• • Means within the bumper to absorb impact [4]
11/06	• for tools or spare parts (for vehicle roof parts B60J 7/20; for spare wheels B62D)	19/20	• • • containing gas or liquid, e.g. inflatable (connection of valves to inflatable elastic bodies B60C 29/00) [4]
13/00	<b>Elements for body-finishing, identifying, or decorating; Arrangements or adaptations for advertising purposes</b>	19/22	• • • containing cellular material, e.g. solid foam [4]
13/01	• Liners for load platforms or load compartments [5]	19/24	• • Arrangements for mounting bumpers on vehicles [4]
13/02	• Trim mouldings; Ledges; Wall liners; Roof liners (B60R 13/01 takes precedence) [5]	19/26	• • • comprising yieldable mounting means (springs, shock absorbers, or means for damping vibrations <u>per se</u> F16F) [4]
13/04	• Ornamental or guard strips; Ornamental inscriptive devices	19/28	• • • • Metallic springs [4]
13/06	• Sealing strips (sealing arrangements for vehicle windows, windscreens, non-fixed roofs, doors, or similar devices B60J 10/00)	19/30	• • • • Elastomeric material [4]
		19/32	• • • • Fluid shock absorbers [4]

- 19/34 • • • destroyed upon impact, e.g. one-shot type [4]
- 19/36 • • • Combinations of yieldable mounting means of different types [4]
- 19/38 • • • adjustably or movably mounted, e.g. horizontally displaceable for securing a space between parked vehicles [4]
- 19/40 • • • in the direction of an obstacle before a collision [4]
- 19/42 • • extending primarily along the sides of, or completely encircling, a vehicle (ornamental or guard strips B60R 13/04) [4]
- 19/44 • • Bumper guards [4]
- 19/46 • • • spring- or pivotally-mounted [4]
- 19/48 • • combined with, or convertible into, other devices or objects, e.g. bumpers combined with road brushes, bumpers convertible into beds [4]
- 19/50 • • • with lights or registration plates [4]
- 19/52 • Radiator or grille guards [4]
- 19/54 • Obstruction removers or deflectors (B60R 19/16, B60R 21/34 take precedence) [4]
- 19/56 • Arrangements on high-riding vehicles, e.g. lorries, for preventing vehicles or objects from running thereunder [4]
- 21/00 Arrangements or fittings on vehicles for protecting or preventing injuries to occupants or pedestrians in case of accidents or other traffic risks** (safety belts or body harnesses in vehicles B60R 22/00; devices, apparatus or methods for life-saving in general A62B; safety devices for propulsion unit control specially adapted for, or arranged in, vehicles B60K 28/00; seats constructed to protect the occupant from the effect of abnormal g-forces, e.g. crash or safety seats, B60N 2/42; energy-absorbing arrangements for hand wheels for steering vehicles B62D 1/11; energy-absorbing arrangements for vehicle steering columns B62D 1/19; harnessing in aircraft B64D 25/00) [4, 5]
- 21/01 • Electrical circuits for triggering safety arrangements in case of vehicle accidents or impending vehicle accidents [7]
- 21/013 • • including means for detecting collisions, impending collisions or roll-over [2006.01]
- 21/0132 • • • responsive to vehicle motion parameters [2006.01]
- 21/0134 • • • responsive to imminent contact with an obstacle [2006.01]
- 21/0136 • • • responsive to actual contact with an obstacle [2006.01]
- 21/015 • • including means for detecting the presence or position of passengers, passenger seats or child seats, e.g. for disabling triggering [2006.01]
- 21/017 • • including arrangements for providing electric power to the safety arrangements [2006.01]
- 21/02 • Occupant safety arrangements or fittings [4]
- 21/04 • • Padded linings for the vehicle interior [4]
- 21/045 • • • associated with the instrument panel or dashboard [4]
- 21/05 • • • associated with the steering wheel, hand lever or column (yieldable steering columns B62D 1/18) [4, 5]
- 21/055 • • Padded fittings, e.g. head rests, sun visors [4]
- 21/06 • • Safety nets, transparent sheets, curtains, or the like, e.g. between occupants and glass (B60R 21/11, B60R 21/12, B60R 21/16 take precedence) [4]
- 21/08 • • • movable from an inoperative to an operative position, e.g. in a collision (electrical circuits for triggering safety arrangements B60R 21/01) [4, 7]
- 21/09 • • Control elements or operating handles movable from an operative to an out-of-the way position, e.g. switch knobs, window cranks [4]
- 21/11 • • Overhead guards, e.g. against loads falling down [4]
- 21/12 • • which protect the occupants against personal attack from the inside or the outside of the vehicle [4]
- 21/13 • • Roll-over protection (electrical circuits for triggering safety arrangements B60R 21/01) [4, 7]
- 21/16 • • Inflatable occupant restraints or confinements designed to inflate upon impact or impending impact, e.g. air bags (connection of valves to inflatable elastic bodies B60C 29/00) [4]
- 21/18 • • • the inflatable member formed as a belt or harness or combined with a belt or harness arrangement [4]
- 21/20 • • • *Arrangements for storing inflatable members in their non-use or deflated condition; Arrangement or mounting of air bag modules or components [4, 2006.01, 2011.01]*
- 21/201 • • • • *Packaging straps or envelopes for inflatable members [2011.01]*
- 21/203 • • • • in steering wheels or steering columns [2006.01]
- 21/205 • • • • in dashboards [2006.01, 2011.01]
- 21/206 • • • • in the lower part of dashboards, e.g. for protecting the knees [2011.01]
- 21/207 • • • • in vehicle seats [2006.01]
- 21/21 • • • • in vehicle side panels, e.g. doors (pillar mounted arrangements B60R 21/213) [2006.01, 2011.01]
- 21/213 • • • • in vehicle roof frames or pillars [2006.01, 2011.01]
- 21/214 • • • • in roof panels [2011.01]
- 21/215 • • • • characterised by the covers for the inflatable member [2006.01, 2011.01]
- 21/2155 • • • • with complex motion of the cover; Retraction under the lining during opening [2011.01]
- 21/216 • • • • comprising tether means for limitation of cover motion during deployment [2011.01]
- 21/2165 • • • • characterised by a tear line for defining a deployment opening [2011.01]
- 21/217 • • • • Inflation fluid source retainers, e.g. reaction canisters; Connection of bags, covers, diffusers or inflation fluid sources therewith or together [2006.01, 2011.01]
- 21/23 • • • Inflatable members (B60R 21/18 takes precedence) [2006.01]
- 21/231 • • • • characterised by their shape, construction or spatial configuration [2006.01, 2011.01]
- 21/232 • • • • Curtain-type airbags deploying mainly in a vertical direction from their top edge [2011.01]
- 21/233 • • • • comprising a plurality of individual compartments; comprising two or more bag-like members, one within the other (B60R 21/232 takes precedence) [2006.01]
- 21/2334 • • • • • Expansion regulating features [2011.01]
- 21/2338 • • • • • Tethers [2011.01]

- 21/2342 • • • • • *Tear seams [2011.01]*
- 21/2346 • • • • • *Soft diffusers [2011.01]*
- 21/235 • • • • characterised by their material [2006.01]
- 21/237 • • • • characterised by the way they are folded [2006.01]
- 21/239 • • • • characterised by their venting means [2006.01]
- 21/26 • • • *characterised by the inflation fluid source or means to control inflation fluid flow [4, 2011.01]*
- 21/261 • • • • *with means other than bag structure to diffuse or guide inflation fluid [2011.01]*
- 21/262 • • • • *Elongated tubular diffusers, e.g. curtain-type [2011.01]*
- 21/263 • • • • *using a variable source, e.g. plural stage or controlled output (hybrid inflator B60R 21/272) [2011.01]*
- 21/264 • • • • using instantaneous generation of gas, e.g. pyrotechnic (B60R 21/268 takes precedence) [2006.01]
- 21/268 • • • • *using instantaneous release of stored pressurised gas [2006.01, 2011.01]*
- 21/272 • • • • • with means for increasing the pressure of the gas just before or during liberation, e.g. hybrid inflators [2006.01]
- 21/274 • • • • • *characterised by means to rupture or open the fluid source [2011.01]*
- 21/276 • • • • with means to vent the inflation fluid source, e.g. in case of overpressure [2006.01]
- 21/30 • • • • with means to draw ambient air into the flow line and mix such air with the inflation fluid [4]
- 21/33 • • • Arrangements for non-electric triggering of inflation (electrical circuits for triggering safety arrangements B60R 21/01) [2006.01]
- 21/34 • *Protecting non-occupants of a vehicle, e.g. pedestrians [4, 2011.01]*
- 21/36 • • *using airbags [2011.01]*
- 21/38 • • *using means for lifting bonnets [2011.01]*
- 22/00 Safety belts or body harnesses in vehicles** (safety belts or body harnesses in general A62B 35/00) [4]
- 22/02 • Semi-passive restraint systems, e.g. systems applied or removed automatically but not both [4]
- 22/03 • • Means for presenting the belt or part thereof to the wearer [6]
- 22/04 • Passive restraint systems, i.e. systems both applied and removed automatically, e.g. by movement of the vehicle door [4]
- 22/06 • • having the belt or harness connected to a member slidable in a vehicle-mounted track [4]
- 22/08 • • having the belt retractor mounted on or in a vehicle closure, e.g. the door [4]
- 22/10 • specially adapted for children or animals (children's seats B60N 2/24) [4]
- Note(s)**
- Groups B60R 22/02-B60R 22/08 and B60R 22/12-B60R 22/48 take precedence over group B60R 22/10.
- 22/12 • Construction of belts or harnesses (B60R 21/18 takes precedence) [4]
- 22/14 • • incorporating enlarged restraint areas, e.g. vests, nets [4]
- 22/16 • • using belts which become permanently deformed, i.e. one time use [4]
- 22/18 • Anchoring devices [4]
- 22/185 • • with stopping means for acting directly upon the belt in an emergency, e.g. by clamping or friction [7]
- 22/19 • • with means for reducing belt tension during use under normal conditions [7]
- 22/195 • • with means to tension the belt in an emergency (electrical circuits for triggering safety arrangements B60R 21/01) [7]
- 22/20 • • adjustable in position, e.g. in height [4]
- 22/22 • • secured to the vehicle floor [4]
- 22/24 • • secured to the side, door, or roof of the vehicle [4]
- 22/26 • • secured to the seat [4]
- 22/28 • incorporating energy-absorbing devices [4]
- 22/30 • Coupling devices other than buckles, including length-adjusting fittings (buckles A44B 11/00; releasable fastenings in general F16B) [4]
- 22/32 • Devices for releasing in an emergency, e.g. after an accident [4]
- 22/34 • Belt retractors, e.g. reels (anchoring devices with means to tension the belt in an emergency B60R 22/195) [4, 7]
- 22/343 • • with electrically actuated locking means [6]
- 22/347 • • with means for permanently locking the retractor during the wearing of the belt (B60R 22/343, B60R 22/415 take precedence) [6]
- 22/35 • • • the locking means being automatically actuated [6]
- 22/353 • • • • in response to belt movement when a wearer applies the belt [6]
- 22/357 • • • • in response to fastening of the belt buckle [6]
- 22/36 • • self-locking in an emergency (B60R 22/343 takes precedence) [4]
- 22/38 • • • responsive only to belt movement [4]
- 22/40 • • • responsive only to vehicle movement [4]
- 22/405 • • • responsive to belt movement and vehicle movement [6]
- 22/41 • • • with additional means for preventing locking under predetermined conditions [6]
- 22/415 • • • with additional means allowing a permanent locking of the retractor during the wearing of the belt [6]
- 22/42 • • • having means for acting directly upon the belt, e.g. by clamping or friction [4]
- 22/44 • • with means for reducing belt tension during use under normal conditions [4]
- 22/46 • • with means to tension the belt in an emergency (electrical circuits for triggering safety arrangements B60R 21/01) [4, 7]
- 22/48 • Control systems, alarms, or interlock systems, for the correct application of the belt or harness [4]
- 25/00 Vehicle fittings for preventing or indicating unauthorised use or theft of vehicles** (anti-theft devices for wheel cover discs, rings or the like B60B 7/16; locks or bolts *per se* E05) [5]
- 25/02 • operating on steering mechanism
- 25/04 • preventing use of engine (engines, fittings for normal use, *see* the relevant classes for such engines or fittings)
- 25/06 • operating on transmission
- 25/08 • operating on brake
- 25/10 • actuating a signalling device
- 99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

**B60S SERVICING, CLEANING, REPAIRING, SUPPORTING, LIFTING, OR MANOEUVRING OF VEHICLES, NOT OTHERWISE PROVIDED FOR**

**Note(s)**

Attention is drawn to the Note following the title of class B60.

**Subclass index**

CLEANING.....	1/00, 3/00
SERVICING, MAINTENANCE, REPAIR.....	5/00
LIFTING OR MANOEUVRING	
Devices integral with, or separate from, vehicle.....	9/00, 13/00
Vehicle modifications to receive separate devices.....	11/00

<b>1/00</b>	<b>Cleaning of vehicles</b> (by apparatus not integral with vehicle B60S 3/00; cleaning in general B08B; de-icing of aircraft B64D; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84)	<b>3/00</b>	<b>Vehicle cleaning apparatus not integral with vehicles</b> (cleaning in general B08B; cleaning peculiar to waterborne vessels B63B 57/00, B63B 59/00; ground equipment for cleaning aircraft B64F 5/00)
1/02	• Cleaning windscreens, windows, or optical devices	3/04	• for exteriors of land vehicles
1/04	• • Wipers or the like, e.g. scrapers	3/06	• • with rotary bodies contacting the vehicles
1/06	• • • characterised by the drive (producing other than swinging movement B60S 1/44)	<b>5/00</b>	<b>Servicing, maintaining, repairing, or refitting of vehicles</b> (vehicles adapted to carry a workshop for servicing or maintenance B60P 3/14; servicing rail locomotives B61K)
1/08	• • • • electrically driven	5/02	• Supplying fuel to vehicles; General disposition of plant in filling stations (apparatus for transferring measured quantities of petrol, oil, or the like from storage space to vehicles B67D)
1/10	• • • • pneumatically driven	5/04	• Supplying air for tyre inflation (arrangement of tyre inflating devices on vehicles B60C 23/00; tyre pressure gauges G01L 17/00) [3]
1/12	• • • • hydraulically driven	5/06	• Supplying batteries to, or removing batteries from, vehicles (circuit arrangements for charging batteries H02J 7/00) [6]
1/14	• • • • personally driven	<b>9/00</b>	<b>Ground-engaging vehicle fittings for supporting, lifting, or manoeuvring the vehicle, wholly or in part, e.g. built-in jacks</b> (lifting devices in general B66F; supports in general F16M)
1/16	• • • • Means for transmitting drive	9/02	• for only lifting or supporting
1/18	• • • • • mechanically	9/04	• • mechanically
1/20	• • • • • by cable drives; by flexible shafts	9/06	• • • of screw-and-nut type
1/22	• • • • • by rotary cams	9/08	• • • • the screw axis being substantially vertical
1/24	• • • • • by rotary cranks	9/10	• • by fluid pressure
1/26	• • • • • by toothed gearing	9/12	• • • of telescopic type
1/28	• • • characterised by a plurality of wipers (B60S 1/06 takes precedence)	9/14	• for both lifting and manoeuvring
1/30	• • • • arranged both outside and inside	9/16	• • for operating only on one end of vehicle (B60S 9/205 takes precedence) [4]
1/32	• • • characterised by constructional features of wiper blades or arms	9/18	• • • mechanically
1/34	• • • • Wiper arms; Mountings therefor	9/20	• • • with fluid-pressure lift
1/36	• • • • • Variable-length arms	9/205	• • Power driven manoeuvring fittings, e.g. reciprocally driven steppers or rotatably driven cams (vehicles with ground-engaging propulsion means, e.g. walking members, B62D 57/02) [4]
1/38	• • • • Wiper blades	9/21	• • • comprising a rotatably driven auxiliary wheel or endless track, e.g. driven by a ground wheel (track vehicles with additional or alternative ground wheels B62D 55/02, B62D 55/04; auxiliary drives from a ground wheel B60K 25/08) [4]
1/40	• • • • Connections between blades and arms	9/215	• • • • driven by an auxiliary motor [4]
1/42	• • • • • resilient		
1/44	• • • the wiper blades having other than swinging movement, e.g. rotary		
1/46	• • using liquid; Windscreen washers		
1/48	• • • Liquid supply therefor		
1/50	• • • • Arrangement of reservoir		
1/52	• • • • Arrangement of nozzles (nozzles <u>per se</u> B05B)		
1/54	• • using gas, e.g. hot air		
1/56	• • specially adapted for cleaning other parts or devices than front windows or windscreens		
1/58	• • • for rear windows		
1/60	• • • for signalling devices, e.g. reflectors		
1/62	• Other vehicle fittings for cleaning		
1/64	• • for cleaning vehicle interiors, e.g. built-in vacuum cleaners		
1/66	• • for cleaning vehicle exterior		
1/68	• • • for freeing wheels or tyres from foreign matter, e.g. wheel scrapers		



9/22	• Means for attaching lifting, supporting, or manoeuvring devices to vehicles (for separate devices B60S 11/00)	13/00	<b>Vehicle-manoeuving devices separate from the vehicle</b> (vehicle-lifting or pushing devices B66F)
11/00	<b>Vehicle modifications for receiving separate lifting, supporting, or manoeuvring devices</b>	13/02	• Turntables; Traversers (incorporated in vehicle-storing garages E04H)
B60T	<b>VEHICLE BRAKE CONTROL SYSTEMS OR PARTS THEREOF; BRAKE CONTROL SYSTEMS OR PARTS THEREOF, IN GENERAL</b> (control of electrodynamic brake systems B60L 7/00; conjoint control of brakes and other drive units of vehicles B60W); <b>ARRANGEMENT OF BRAKING ELEMENTS ON VEHICLES IN GENERAL; PORTABLE DEVICES FOR PREVENTING UNWANTED MOVEMENT OF VEHICLES; VEHICLE MODIFICATIONS TO FACILITATE COOLING OF BRAKES [1, 2006.01]</b>		

**Note(s)**

In this subclass, the following expression is used with the meaning indicated:

- "brake control systems" includes brake control systems for vehicles or of general applicability.

**Subclass index**

## IMMOBILISATION

Portable devices.....3/00

## BRAKING

Kind of braking and corresponding arrangements.....1/00

Vehicle modifications for cooling brakes.....5/00

## Kinds of brake control

initiating means; varying braking force or its distribution according to road or load conditions.....7/00, 8/00

continuous braking.....10/00

transmission of control between initiating means and brakes.....11/00, 13/00

## Parts or accessories for fluid-pressure brake control:

valve structure, disposition, and operation.....15/00

other parts or accessories.....17/00

**1/00 Arrangements of braking elements, i.e. of those parts where braking effect occurs**

1/02 • acting by retarding wheels

1/04 • • acting directly on tread

1/06 • • acting otherwise than on tread, e.g. employing rim, drum, disc, or transmission

1/08 • • using fluid or powdered medium

1/087 • • • in hydrodynamic, i.e. non-positive displacement, retarders [3]

1/093 • • • in hydrostatic, i.e. positive displacement, retarders [3]

1/10 • • by utilising wheel movement for accumulating energy, e.g. driving air compressors (using propulsion unit as braking means, see the relevant class)

1/12 • acting otherwise than by retarding wheels, e.g. jet-action

1/14 • • directly on road (portable devices, e.g. chocks, B60T 3/00)

1/16 • • by increasing air resistance, e.g. flaps

**3/00 Portable devices for preventing unwanted movement of vehicles, e.g. chocks****5/00 Vehicle modifications to facilitate cooling of brakes**

7/04 • • foot-actuated

7/06 • • • Disposition of pedal

7/08 • • hand-actuated

7/10 • • • Disposition of hand control

7/12 • for automatic initiation; for initiation not subject to will of driver or passenger

7/14 • • operated upon collapse of driver

7/16 • • operated by remote control, i.e. initiating means not mounted on vehicle

7/18 • • • operated by wayside apparatus

7/20 • • specially adapted for trailers, e.g. in case of uncoupling of trailer (inertia-actuated overrun brakes B60T 13/08)

7/22 • • initiated by contact of vehicle, e.g. bumper, with an external object, e.g. another vehicle [4]

**8/00 Arrangements for adjusting wheel-braking force to meet varying vehicular or ground-surface conditions, e.g. limiting or varying distribution of braking force (by changing number of effective brake cylinders in power brake systems B60T 17/10)**

8/17 • Using electrical or electronic regulation means to control braking [2006.01]

**Note(s) [2006.01]**

When classifying in group B60T 8/17, classification is also made in appropriate places in groups B60T 8/18, B60T 8/24, B60T 8/26 or B60T 8/32 if other aspects than electronic control are of interest.

8/171 • • Detecting parameters used in the regulation; Measuring values used in the regulation [2006.01]

**Brake control systems or parts thereof****7/00 Brake-action initiating means**

7/02 • for personal initiation

- 8/172 • • Determining control parameters used in the regulation, e.g. by calculations involving measured or detected parameters **[2006.01]**
- 8/173 • • Eliminating or reducing the effect of unwanted signals, e.g. due to vibrations or electrical noise **[2006.01]**
- 8/174 • • characterised by using special control logic, e.g. fuzzy logic **[2006.01]**
- 8/175 • • Brake regulation specially adapted to prevent excessive wheel spin during vehicle acceleration, e.g. for traction control **[2006.01]**
- 8/1755 • • Brake regulation specially adapted to control the stability of the vehicle, e.g. taking into account yaw rate or transverse acceleration in a curve (road vehicle drive control systems for control of driving stability otherwise than by controlling a particular sub-unit B60W 30/02) **[2006.01]**
- 8/176 • • Brake regulation specially adapted to prevent excessive wheel slip during vehicle deceleration, e.g. ABS (B60T 8/1755 takes precedence) **[2006.01]**
- 8/1761 • • • responsive to wheel or brake dynamics, e.g. wheel slip, wheel acceleration or rate of change of brake fluid pressure **[2006.01]**
- 8/1763 • • • responsive to the coefficient of friction between the wheels and the ground surface (B60T 8/1764 takes precedence) **[2006.01]**
- 8/1764 • • • Regulation during travel on surface with different coefficients of friction, e.g. between left and right sides, mu-split **[2006.01]**
- 8/1766 • • • Proportioning of brake forces according to vehicle axle loads, e.g. front to rear of vehicle **[2006.01]**
- 8/1769 • • • specially adapted for vehicles having more than one driven axle, e.g. four-wheel drive vehicles **[2006.01]**
- 8/18 • responsive to vehicle weight or load, e.g. load distribution (B60T 8/30 takes precedence; responsive to weight and speed condition B60T 8/58) **[4]**
- 8/20 • • with stepwise control action
- 8/22 • • with continuous control action
- 8/24 • responsive to vehicle inclination or change of direction, e.g. negotiating bends
- 8/26 • characterised by producing differential braking between front and rear wheels
- 8/28 • • responsive to deceleration **[4]**
- 8/30 • • responsive to load **[4]**
- 8/32 • responsive to a speed condition, e.g. acceleration or deceleration (B60T 8/28 takes precedence) **[4]**
- 8/34 • • having a fluid pressure regulator responsive to a speed condition **[4]**
- 8/36 • • • including a pilot valve responding to an electromagnetic force **[4]**
- 8/38 • • • including valve means of the relay or driver controlled type **[4]**
- 8/40 • • • comprising an additional fluid circuit including fluid pressurising means for modifying the pressure of the braking fluid, e.g. including wheel driven pumps for detecting a speed condition, or pumps which are controlled by means independent of the braking system **[4]**
- 8/42 • • • having expanding chambers for controlling pressure **[4]**
- 8/44 • • • co-operating with a power-assist booster means associated with a master cylinder for controlling the release and reapplication of brake pressure through an interaction with the power assist device **[4]**

- 8/46 • • • the pressure being reduced by exhausting fluid **[4]**
- 8/48 • • • connecting the brake actuator to an alternative or additional source of fluid pressure **[4]**
- 8/50 • • • having means for controlling the rate at which pressure is reapplied to the brake **[4]**
- 8/52 • • Torque sensing, i.e. wherein the braking action is controlled by forces producing or tending to produce a twisting or rotating motion on a braked rotating member **[4]**
- 8/54 • • by mechanical means **[4]**
- 8/56 • • having means for changing the coefficient of friction **[4]**
- 8/58 • • responsive to speed and another condition or to plural speed conditions **[4]**

#### **Note(s)**

In this group, a single condition which is itself responsive to, or representative of, another single condition is not regarded as plural conditions.

- 8/60 • • • using electrical circuitry for controlling the braking action, the circuitry deriving a control function relating to the dynamic of the braked vehicle or wheel **[4]**
- 8/62 • • • • wherein the individual vehicle wheels are provided (i) with self-contained braking systems operating the individual wheels in accordance with its dynamic state or (ii) with a central processing unit which receives input from individual wheels or wheel groups and produces a plurality of control signals for separately operating individual wheels or groups of wheels **[4]**
- 8/64 • • • • wherein the controlled braking action is characterised by the manner in which the braking fluid pressure is reduced or reapplied **[4]**
- 8/66 • • • • wherein the braking action is responsive to the difference between a computed or other theoretical vehicle speed and an actual speed of a wheel thereof **[4]**
- 8/68 • • • • • wherein the braking action is controlled by a difference between the rate of change of vehicle velocity and the rate of change of wheel velocity **[4]**
- 8/70 • • • • • sensing both acceleration and deceleration of either the vehicle or the wheel **[4]**
- 8/72 • • responsive to a difference between a speed condition, e.g. deceleration, and a fixed reference (B60T 8/66 takes precedence) **[4]**
- 8/74 • • • sensing a rate of change of velocity **[4]**
- 8/76 • • • two or more sensing means from different wheels indicative of the same type of speed condition **[4]**
- 8/78 • • • using electrical circuitry for controlling the braking action, the circuitry deriving a control function relating to the dynamics of the braked vehicle or wheel **[4]**
- 8/80 • • • • Means sensing a rate of change of velocity **[4]**
- 8/82 • • • • two or more sensing means from different wheels indicative of the same type of speed condition **[4]**

8/84	• • • • wherein two wheels or wheel groups are controlled in dependence on the behaviour of a reference wheel or wheel group, with means for changing the reference wheel, e.g. "select high, select low" operation [4]	13/00	<b>Transmitting braking action from initiating means to ultimate brake actuator with power assistance or drive; Brake systems incorporating such transmitting means, e.g. air-pressure brake systems</b>
8/86	• • wherein the brakes are automatically applied in accordance with a speed condition and having means for overriding the automatic braking device when a skid condition occurs [4]	13/02	• with mechanical assistance or drive
8/88	• • with failure responsive means, i.e. means for detecting and indicating faulty operation of the speed responsive control means [4]	13/04	• • by spring or weight (fluid-released B60T 13/10)
8/90	• • • using a simulated speed signal to test speed responsive control means [4]	13/06	• • by inertia, e.g. flywheel
8/92	• • • automatically taking corrective action [4]	13/08	• • • Overrun brakes
8/94	• • • • on a fluid pressure regulator [4]	13/10	• with fluid assistance, drive, or release
8/96	• • • • on speed responsive control means [4]	13/12	• • the fluid being liquid
10/00	<b>Control or regulation for continuous braking making use of fluid or powdered medium, e.g. for use when descending a long slope [4]</b>	13/122	• • • Systems using both master cylinder and distributor valve; Structural associations of master cylinder with distributor valve [6]
10/02	• with hydrodynamic brake [4]	13/125	• • • Systems using brake pressure distributor valve without master cylinder [6]
10/04	• with hydrostatic brake [4]	13/128	• • • Systems using booster hydraulically combined with master cylinder [6]
11/00	<b>Transmitting braking action from initiating means to ultimate brake actuator without power assistance or drive or where such assistance or drive is irrelevant [5]</b>	13/13	• • • • with additional direct hydraulic output from booster to brake circuit [6]
11/04	• transmitting mechanically [5]	13/132	• • • Systems using booster having mechanical output, e.g. to master cylinder [6]
11/06	• • Equalising arrangements [5]	13/135	• • • Boosters characterised by control valve in booster piston [6]
11/08	• • providing variable leverage [5]	13/138	• • • Pressure supply arrangements [6]
11/10	• transmitting by fluid means, e.g. hydraulic [5]	13/14	• • • • using accumulators or reservoirs [6]
11/12	• • the transmitted force being varied therein (B60T 11/16-B60T 11/28 take precedence) [5]	13/16	• • • • using pumps directly, i.e. without interposition of accumulators or reservoirs [6]
11/14	• • the transmitted force being substantially unchanged [5]	13/18	• • • • • with control of pump output delivery [6]
11/16	• • Master control, e.g. master cylinders [5]	13/20	• • • • • with control of pump driving means [6]
11/18	• • • Connection thereof to initiating means [5]	13/22	• • • Brakes applied by springs or weights and released hydraulically
11/20	• • • Tandem, side-by-side, or other multiple master-cylinder units [5]	13/24	• • the fluid being gaseous
11/21	• • • • with two pedals operating on respective circuits, pressures therein being equalised when both pedals are operated together, e.g. for steering [5]	13/26	• • • Compressed-air systems
11/22	• • • characterised by being integral with reservoir [5]	13/36	• • • • direct, i.e. brakes applied directly by compressed air
11/224	• • • with pressure-varying means, e.g. with two stage operation provided by use of different piston diameters including continuous variation from one diameter to another [5]	13/38	• • • • Brakes applied by springs or weights and released by compressed air
11/228	• • • Pressure-maintaining arrangements, e.g. for replenishing the master cylinder chamber with fluid from a reservoir (B60T 11/232 takes precedence) [5]	13/40	• • • • indirect, i.e. compressed-air booster units
11/232	• • • Recuperation valves [5]	13/44	• • • • • with two-chamber booster units
11/236	• • • Piston sealing arrangements [5]	13/45	• • • • • with multiple booster units, e.g. tandem booster units [5]
11/24	• • Single initiating means operating on more than one circuit, e.g. dual circuits (multiple master-cylinder units B60T 11/20) [5]	13/46	• • • Vacuum systems
11/26	• • Reservoirs (integral with master controls B60T 11/22) [5]	13/48	• • • • direct, i.e. brakes applied directly by vacuum
11/28	• • Valves specially adapted therefor (recuperation valves B60T 11/232) [5]	13/50	• • • • Brakes applied by springs or weights and released by vacuum
11/30	• • • Bleed valves for hydraulic brake systems [5]	13/52	• • • • indirect, i.e. vacuum booster units
11/32	• • • Automatic cut-off valves for defective pipes [5]	13/56	• • • • • with two-chamber booster units
11/34	• • • Pressure-reducing or limiting valves [5]	13/563	• • • • • with multiple booster units, e.g. tandem booster units [5]
		13/565	• • • • • characterised by being associated with master cylinders, e.g. integrally formed [5]
		13/567	• • • • • characterised by constructional features of the casing or by its strengthening or mounting arrangements [5]
		13/569	• • • • • characterised by piston details, e.g. construction, mounting of diaphragm [5]
		13/57	• • • • • characterised by constructional features of control valves [5]
		13/573	• • • • • characterised by reaction devices [5]
		13/575	• • • • • • using resilient discs or pads [5]
		13/577	• • • • • • using levers [5]
		13/58	• • Combined or convertible systems
		13/60	• • • both fluid pressure and vacuum

## B60T

- 13/62 • • • both straight and automatic
- 13/64 • • • both single and multiple, e.g. single and tandem
- 13/66 • • Electrical control in fluid-pressure brake systems
- 13/68 • • • by electrically-controlled valves
- 13/70 • • • by fluid-controlled switches
- 13/72 • • • in vacuum systems
- 13/74 • with electrical assistance or drive
- 15/00 Construction, arrangement, or operation of valves incorporated in power brake systems and not covered by groups B60T 11/00 or B60T 13/00** (valve structures responsive to a speed condition B60T 8/34) [4]
  - 15/02 • Application and release valves
  - 15/04 • • Driver's valves
  - 15/06 • • • Single driver's valves for pressure brakes without automatic control
  - 15/08 • • • Driver's valves for pressure brakes having automatic control
  - 15/10 • • • for vacuum brakes
  - 15/12 • • • combined with relay valves or the like
  - 15/14 • • • influencing electric control means
  - 15/16 • • • Arrangements enabling systems to be controlled from two or more positions
  - 15/18 • • Triple or other relay valves which allow step-wise application or release and which are actuated by brake-pipe pressure variation to connect brake cylinders or equivalent to compressed-air or vacuum source or atmosphere
  - 15/20 • • • controlled by two fluid pressures
  - 15/22 • • • • with one or more auxiliary valves, for braking, releasing, filling reservoirs
  - 15/24 • • • controlled by three fluid pressures
  - 15/26 • • • • without a quick braking action
  - 15/28 • • • • • and having auxiliary valves
  - 15/30 • • • • • with a quick braking action
  - 15/32 • • • • • and having auxiliary valves
  - 15/34 • • • controlled alternatively by two or three fluid pressures
  - 15/36 • • Other control devices or valves characterised by definite functions
  - 15/38 • • • for quick take-up and heavy braking, e.g. with auxiliary reservoir for taking-up slack
  - 15/40 • • • • with separate take-up and applying cylinders
- 15/42 • • • with a quick braking action, i.e. with accelerating valves actuated by brake-pipe pressure variation
- 15/44 • • • • and operating independently of the main control device
- 15/46 • • • for retarding braking action to prevent rear vehicles of a vehicle train from overtaking the forward ones
- 15/48 • • • for filling reservoirs
- 15/50 • • • • with means for limiting or relieving pressure in reservoirs
- 15/52 • • • for quick release of brakes, e.g. for influencing counter-pressure in triple valve or recirculating air from reservoir or brake cylinder to brake pipe
- 15/54 • • • for controlling exhaust from triple valve or from brake cylinder
- 15/56 • • • for filling reservoirs by means of a secondary supply pipe
- 15/58 • • • for supplying control impulses through a secondary air pipe
- 15/60 • • • for releasing or applying brakes when vehicles of a vehicle train are uncoupled
- 17/00 Component parts, details, or accessories of brake systems not covered by groups B60T 8/00, B60T 13/00 or B60T 15/00, or presenting other characteristic features** [4]
  - 17/02 • Arrangements of pumps or compressors, or control devices therefor
  - 17/04 • Arrangement of piping, valves in the piping, e.g. cut-off valves, couplings or air hoses [4]
  - 17/06 • Applications or arrangements of reservoirs
  - 17/08 • Brake cylinders other than ultimate actuators
  - 17/10 • • Two or more cylinders acting on the same brake with means for rendering them effective selectively or successively, the number of effective cylinders being variable
  - 17/12 • • • according to vehicle weight
  - 17/14 • • • according to vehicle speed
  - 17/16 • • Locking of brake cylinders
  - 17/18 • Safety devices; Monitoring
  - 17/20 • • Safety devices operable by passengers other than the driver
  - 17/22 • • Devices for monitoring or checking brake systems; Signal devices

## B60V AIR-CUSHION VEHICLES

### Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "air-cushion vehicles" includes all vehicles which are wholly or partly supported on land or water by air or other gaseous cushions.

- 1/00 Air-cushion vehicles** (land vehicles, waterborne vessels, or aircraft adapted or modified to travel on air cushions B60V 3/00)
  - 1/02 • wherein the cushion is generated and contained by at least one peripheral fluid curtain
  - 1/04 • wherein the cushion is contained at least in part by walls
  - 1/06 • wherein the cushion is formed within plenum chamber
  - 1/08 • wherein the cushion is created during forward movement of the vehicle by ram effect
  - 1/10 • in which the curtain-forming nozzle or the vehicle base is shaped to create a vortex curtain
  - 1/11 • Stability or attitude control [2]
  - 1/12 • • by dividing the cushion [2]
  - 1/14 • Propulsion; Control thereof (B60V 1/11 takes precedence) [2]
  - 1/15 • • using part of the cushion-forming fluid [2]
  - 1/16 • Flexible skirts
  - 1/18 • Body structure
  - 1/20 • Spray deflectors
  - 1/22 • provided with hydrofoils

**3/00 Land vehicles, waterborne vessels, or aircraft, adapted or modified to travel on air cushions**

- 3/02 • Land vehicles, e.g. road vehicles

- 3/04 • • co-operating with rails or other guiding means, e.g. with air cushion between rail and vehicle

- 3/06 • Waterborne vessels

- 3/08 • Aircraft, e.g. air-cushion alighting-gear therefor

**B60W CONJOINT CONTROL OF VEHICLE SUB-UNITS OF DIFFERENT TYPE OR DIFFERENT FUNCTION; CONTROL SYSTEMS SPECIALLY ADAPTED FOR HYBRID VEHICLES; ROAD VEHICLE DRIVE CONTROL SYSTEMS FOR PURPOSES NOT RELATED TO THE CONTROL OF A PARTICULAR SUB-UNIT [2006.01]**

**Note(s) [2006.01]**

1. This subclass does not cover the control of a single sub-unit; such control is classified in the relevant place for the sub-unit, e.g. F02D, F16H. Where a single sub-unit is controlled by means of signals or commands from other sub-units, the control of this single sub-unit is classified in the relevant place for this sub-unit. For example, the control of variable-ratio gearing by means of signals from the engine or the accelerator is classified in the subclass for gearing, F16H.
2. Conjoint control of driveline units, e.g. engines, and variable-ratio gearing occurring only transiently during ratio shift and being also characterised by the control of the gearing is also classified in the subclass for gearing, F16H.
3. In groups B60W 20/00-B60W 50/00, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.
4. When classifying in group B60W 10/00, classification must also be made in groups B60W 20/00-B60W 50/00 in order to identify the purpose or use of the control.
5. In this subclass, the following terms are used with the meanings indicated:
  - "conjoint control" means that a programmed or condition-responsive automatic controller on board the vehicle, embodying control logic for vehicle sub-units of different type or different function, sends control signals to actuators of two or more vehicle sub-units, so that the sub-units act together to solve a particular problem or in response to a particular driving condition;
  - "drive control system" means an electronic system in a road vehicle for automatically controlling the movement of that vehicle in order to take certain actions;
  - "road vehicle" means a vehicle normally under the control of a human driver for transportation on roads, e.g. an automobile, truck or bus;
  - "sub-unit" means one of the following vehicle systems: propulsion system, clutch system, change-speed gearing system, system for distributing drive torque between front and rear axles, axle differential system, brake system, steering system, suspension system, energy storage means, fuel cells or auxiliary equipment.

**10/00 Conjoint control of vehicle sub-units of different type or different function (for propulsion of purely electrically-propelled vehicles with power supplied within the vehicle B60L 11/00) [2006.01]**

**Note(s) [2006.01]**

When classifying in this group, each controlled sub-unit must be separately identified by a classification in a relevant place in this group.

- 10/02 • including control of driveline clutches [2006.01]
- 10/04 • including control of propulsion units [2006.01]
- 10/06 • • including control of combustion engines [2006.01]
- 10/08 • • including control of electric propulsion units, e.g. motors or generators [2006.01]
- 10/10 • including control of change-speed gearings [2006.01]
- 10/12 • including control of differentials [2006.01]
- 10/18 • including control of braking systems [2006.01]
- 10/20 • including control of steering systems [2006.01]
- 10/22 • including control of suspension systems [2006.01]
- 10/24 • including control of energy storage means [2006.01]
- 10/26 • • for electrical energy, e.g. batteries or capacitors [2006.01]
- 10/28 • including control of fuel cells [2006.01]
- 10/30 • including control of auxiliary equipment, e.g. air-conditioning compressors or oil pumps [2006.01]

**20/00 Control systems specially adapted for hybrid vehicles, i.e. vehicles having two or more prime movers of more than one type, e.g. electrical and internal combustion motors, all used for propulsion of the vehicle [2006.01]**

**30/00 Purposes of road vehicle drive control systems not related to the control of a particular sub-unit, e.g. of systems using conjoint control of vehicle sub-units [2006.01]**

- 30/02 • Control of vehicle driving stability [2006.01]
- 30/04 • • related to roll-over prevention [2006.01]
- 30/06 • Automatic manoeuvring for parking [2006.01]
- 30/08 • Predicting or avoiding probable or impending collision [2006.01]
- 30/10 • Path keeping [2006.01]
- 30/12 • • Lane keeping [2006.01]
- 30/14 • Cruise control [2006.01]
- 30/16 • • Control of distance between vehicles, e.g. keeping a distance to preceding vehicle [2006.01]
- 30/18 • Propelling the vehicle [2006.01]
- 30/20 • • Reducing vibrations in the driveline [2006.01]

**40/00 Estimation or calculation of driving parameters for road vehicle drive control systems not related to the control of a particular sub-unit [2006.01]**

- 40/02 • related to ambient conditions [2006.01]
- 40/04 • • Traffic conditions [2006.01]
- 40/06 • • Road conditions [2006.01]
- 40/08 • related to drivers or passengers [2006.01]
- 40/10 • related to vehicle motion [2006.01]
- 40/12 • related to parameters of the vehicle itself [2006.01]

**50/00 Details of control systems for road vehicle drive control not related to the control of a particular sub-unit [2006.01]**

- 50/02 • Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures [2006.01]

- 50/04 • Monitoring the functioning of the control system **[2006.01]**
- 50/06 • Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot **[2006.01]**

- 50/08 • Interaction between the driver and the control system **[2006.01]**

**Note(s)**

- "railway systems" covers:
  - a. systems in which trains or individual passenger vehicles or load carriers run on, or are guided by, ground or elevated tracks defined by rails, ropes, cables, or other guiding elements for wheels, rollers, or sliding anti-friction devices (permanently attached to a continuous traction element B65G 17/00);
  - b. systems in which carriers or impellers for persons or loads are attached to, e.g. suspended from, a guided traction rope or cable which determines their path of movement (chain conveyers, scraper conveyers B65G 17/00, B65G 19/00);
  - c. power and free systems of either of the above types in which vehicles, load-carriers, or loads may be selectively coupled to, or uncoupled from, continuous traction members, e.g. cables, chains.

**B61B RAILWAY SYSTEMS; EQUIPMENT THEREFOR NOT OTHERWISE PROVIDED FOR** (lifts or hoists, elevators, escalators, moving walkways B66B) [4]

In this subclass, the following terms are used with the meanings indicated:

- "rope railways" covers railways using cables or chains as traction or suspension means;
- "ropes", "cables", or "chains" are equivalent unless specifically mentioned.

CONVENTIONAL SYSTEMS.....	1/00
ELEVATED SYSTEMS.....	3/00, 5/00
CABLE SYSTEMS	
Flexible suspended track; rigid track.....	7/00, 9/00
Trackless.....	11/00
Power-and-free systems.....	10/00
Component parts.....	12/00
OTHER SYSTEMS: COMBINATIONS.....	13/00, 15/00

1/00	<b>General arrangement of stations, platforms, or sidings; Railway networks; Rail-vehicle marshalling systems</b> (shunting humps or shunting devices B61J; construction of platforms E01F 1/00; time-tables G09D)		
1/02	<ul style="list-style-type: none"> <li>General arrangement of stations and platforms including protection devices for the passengers</li> </ul>		
<b><u>Elevated railways</u></b>			
3/00	<b>Elevated railway systems with suspended vehicles</b> (with suspended flexible tracks B61B 7/00; saddle or like balanced type with monorail B61B 13/06; with propelling cables and for transporting materials B65G; tracks therefor E01B 25/00)		
3/02	<ul style="list-style-type: none"> <li>with self-propelled vehicles</li> </ul>		
5/00	<b>Elevated railway systems without suspended vehicles</b> (with monorail B61B 13/04; tracks therefor E01B 25/00)		
5/02	<ul style="list-style-type: none"> <li>with two or more rails</li> </ul>		
		<b><u>Rope railways; Power-and-free systems [2]</u></b>	
		7/00	<b>Rope railway systems with suspended flexible tracks</b>
		7/02	<ul style="list-style-type: none"> <li>with separate haulage cables</li> </ul>
		7/04	<ul style="list-style-type: none"> <li>with suspended tracks serving as haulage cables</li> </ul>
		7/06	<ul style="list-style-type: none"> <li>with self-propelled vehicles</li> </ul>
		9/00	<b>Tramway or funicular systems with rigid track and cable traction</b> (haulage clips B61B 12/12; shunting devices with cable traction B61J) [2]
		10/00	<b>Power-and-free systems</b> (ski-lift, sleigh-lift or like trackless systems with guided towing cables only B61B 11/00) [2]
		10/02	<ul style="list-style-type: none"> <li>with suspended vehicles [2]</li> </ul>
		10/04	<ul style="list-style-type: none"> <li>with vehicles rolling trackless on the ground [2]</li> </ul>
		11/00	<b>Ski-lift, sleigh-lift or like trackless systems with guided towing cables only</b>
		12/00	<b>Component parts, details, or accessories for rope railways or power-and-free systems not provided for in groups B61B 7/00-B61B 11/00</b> (railway brakes B61H; turntables B61J 1/06) [2]

- 12/02 • Suspension of the load; Guiding means, e.g. wheels; Attaching traction cables [2]
- 12/04 • Devices for damping vibrations [2]
- 12/06 • Safety devices or measures against cable fracture [2]
- 12/08 • Cable lubrication [2]
- 12/10 • Cable traction drives [2]
- 12/12 • Cable grippers; Haulage clips [2]

- 13/02 • Rack railways
- 13/04 • Monorail systems
- 13/06 • • Saddle or like balanced type
- 13/08 • Sliding or levitation systems (magnetic suspension or levitation for vehicles, per se B60L 13/04; vehicles with air cushions between rails and vehicles B60V 3/04) [4]
- 13/10 • Tunnel systems (pneumatic tube conveyers B65G)
- 13/12 • Systems with propulsion devices between or alongside the rails, e.g. pneumatic systems (cable traction B61B 9/00; car-shunting devices B61J)

#### **Other railway systems; Combinations of systems**

##### **13/00 Other railway systems**

##### **15/00 Combinations of railway systems**

**B61C LOCOMOTIVES; MOTOR RAILCARS** (vehicles in general B60; frames or bogies B61F; special railroad equipment for locomotives B61J, B61K)

#### **Note(s)**

This subclass covers:

- general design features or items of locomotives and motor railcars not otherwise provided for;
- non-electric features of electric locomotives.

#### **Subclass index**

##### **LOCOMOTIVES AND RAILCARS IN GENERAL**

Characterised by motive power:

- steam; electric; IC or gas turbine.....1/00, 3/00, 5/00
- other.....7/00

Characterised by transmission system.....9/00

Characterised by type of means applying tractive effort.....11/00

**LOCOMOTIVES AND RAILCARS FOR PARTICULAR USES.....13/00**

##### **DETAILS AND ACCESSORIES**

For particular transmission systems.....9/00

For particular propulsion means.....11/00

General and not otherwise provided for.....15/00, 17/00

**FILLING STATIONS FOR AIR OR STEAM ACCUMULATORS.....8/00**

#### **Locomotives or motor railcars in general or characterised by the type of motive power plant used**

- 1/00 Steam locomotives or railcars** (characterised by power transmissions B61C 9/00; engines F01; boilers F22B)
- 1/02 • of articulated construction; with two or more engines (appliances of booster engines B61C 15/02)
- 1/04 • with steam accumulators (steam accumulators F01K)
- 1/06 • Streamlining (of coachwork B61D)
- 1/08 • Arrangement or disposition of combustion apparatus or accessories therefor
- 1/10 • Arrangement or disposition of steam generators
- 1/12 • Arrangement or disposition of condensers
- 1/14 • Arrangement or disposition of exhaust apparatus
- 3/00 Electric locomotives or railcars** (characterised by power transmission B61C 9/00; electrical features B60L, H02)
- 3/02 • with electric accumulators
- 5/00 Locomotives or motor railcars with IC engines or gas turbines** (characterised by power transmission B61C 9/00; engines F02)
- 5/02 • Arrangement or disposition of intakes and apparatus for supplying, circulating, or filtering air for combustion or engine-cooling purposes

- 5/04 • Arrangement or disposition of exhaust apparatus

#### **7/00 Other locomotives or motor railcars characterised by the type of motive power plant used; Locomotives or motor railcars with two or more different kinds or types of motive power**

- 7/02 • Locomotives or motor railcars with pneumatic accumulators
- 7/04 • Locomotives or motor railcars with two or more different kinds or types of engines, e.g. steam and IC engines

#### **8/00 Filling stations for steam- or pneumatic-accumulator locomotives or motor railcars**

#### **9/00 Locomotives or motor railcars characterised by the type of transmission system used; Transmission systems specially adapted for locomotives or motor railcars (machine elements F16)**

- 9/02 • Transmission systems in or for locomotives or motor railcars with reciprocating-piston steam engines
- 9/04 • • consisting of cranked axles and coupling-rods
- 9/06 • • having toothed, chain, friction, or belt gearing

## B61C

- 9/08 • Transmission systems in or for locomotives or motor railcars with IC reciprocating-piston engines
- 9/10 • • mechanical (combined with hydraulic gearing B61C 9/14)
- 9/12 • • • with change-speed gearing
- 9/14 • • hydraulic, including combinations with mechanical gearing
- 9/16 • • • using gearing of the hydrostatic type
- 9/18 • • • using gearing of the hydrokinetic type
- 9/20 • • • • with mechanical change-speed gearing
- 9/22 • • pneumatic
- 9/24 • • electric (B61C 9/38 takes precedence)
- 9/26 • • with transmission shafts at an angle to the driving axles
- 9/28 • Transmission systems in or for locomotives or motor railcars with rotary prime movers, e.g. turbines
- 9/30 • • mechanical (combined with hydraulic gearing B61C 9/34)
- 9/32 • • • with change-speed gearing
- 9/34 • • hydraulic, including combinations with mechanical gearing
- 9/36 • • electric (B61C 9/38 takes precedence)
- 9/38 • Transmission systems in or for locomotives or motor railcars with electric motor propulsion (electrical features B60L, H02)
- 9/40 • • with cranked axles and coupling-rods
- 9/42 • • hydraulic
- 9/44 • • with hollow transmission shaft concentric with wheel axis
- 9/46 • • with motors forming parts of wheels
- 9/48 • • with motors supported on vehicle frames and driving axles, e.g. axle or nose suspension
- 9/50 • • • in bogies
- 9/52 • • with transmission shafts at an angle to the driving axles

### Locomotives or motor railcars characterised by the type of means applying the tractive effort, or by their application to special railway systems or purposes

- 11/00 Locomotives or motor railcars characterised by the type of means applying the tractive effort; Arrangement or disposition of running gear other than normal driving wheels** (construction of wheels B60B)
- 11/02 • tractive effort applied to cables or chains
- 11/04 • tractive effort applied to racks
- 11/06 • tractive effort applied or supplied by aerodynamic force or fluid reaction, e.g. air-screws or jet or rocket propulsion
- 13/00 Locomotives or motor railcars characterised by their application to special systems or purposes** (B61C 11/00 takes precedence; self-propelled scaffold cars, break-down cranes, inspection trolleys B61D 15/00; general design of track recording vehicles B61K 9/00)

**B61D BODY DETAILS OR KINDS OF RAILWAY VEHICLES** (vehicles in general B60; adaptation of vehicles to special systems B61B; underframes B61F)

- 13/02 • for towing or transporting ships or for like special purposes
- 13/04 • for elevated railways with rigid rails (B61C 13/08 takes precedence)
- 13/06 • for railways with suspended flexible tracks, e.g. rope railways
- 13/08 • for saddle or like balanced-type railways

### Details or accessories not otherwise provided for

- 15/00 Maintaining or augmenting the starting or braking power by auxiliary devices and measures; Preventing wheel slippage; Controlling distribution of tractive effort between driving wheels** (propelling locomotives or motor railcars by special means B61C 11/00; driving wheels with non-slipping devices B60B; brakes B61H; wetting or lubricating rails B61K)
- 15/02 • by auxiliary driving wheels; by temporary coupling or use of flywheels or booster engines
- 15/04 • by controlling wheel pressure, e.g. by movable weights or heavy parts or by magnetic devices (magnetic brakes B61H)
- 15/06 • • by displacing fuel, ballast, or the like
- 15/08 • Preventing wheel slippage (adjusting wheel-braking force to prevent wheel slippage B60T 8/00)
- 15/10 • • by depositing sand or like friction-increasing materials (for vehicles in general B60B; combined control of sanding apparatus and brakes B61H)
- 15/12 • • by reducing the driving power
- 15/14 • controlling distribution of tractive effort between driving wheels
- 17/00 Arrangement or disposition of parts; Details or accessories not otherwise provided for; Use of control gear and control systems [2]**
- 17/02 • Bunkers; Tanks; Tenders (coachwork B61D); Water or fuel pick-up or scoop apparatus; Water or fuel supply fittings (trackside installations, e.g. bunkers, tanks, for filling locomotives with sand or water B61K 11/00)
- 17/04 • Arrangement or disposition of driving cabins, footplates, or engine rooms; Ventilation thereof (driving cabins or accessories B61D)
- 17/06 • Power storing devices
- 17/08 • Lubrication systems (in general F16N)
- 17/10 • Connecting-rods for driving wheels; Arrangements of their bearings (connecting-rods or bearings, in general F16C 7/00, F16C 9/04)
- 17/12 • Control gear; Arrangements for controlling locomotives from remote points in the train or when operating in multiple units (control from points outside the train B61L 3/00; fluid-actuated telemotors, servomotors F15B; control devices in general G05)

### Subclass index

#### KINDS OF VEHICLES

Passenger; goods; tank; mine..... 1/00, 3/00, 5/00, 11/00



Hopper; tipping.....	7/00, 9/00
Tramway.....	13/00
Other.....	15/00
<b>BODY DETAILS AND ACCESSORIES</b>	
<b>Details</b>	
bodywork: general; doors; steps; windows; movable roofs; loading means.....	17/00, 19/00, 23/00, 25/00, 39/00, 47/00
interior fittings: sleeping; seating; sanitation; air- conditioning; lighting; other.....	31/00, 33/00, 35/00, 27/00, 29/00, 37/00
devices using movement of vehicle.....	43/00
other.....	49/00
<b>Accessories</b>	
signs, ticket-holders.....	41/00
covers; securing load.....	39/00, 45/00
other.....	49/00

### **Kinds of railway or tramway vehicles**

<b>1/00</b>	<b>Carriages for ordinary railway passenger traffic</b> (mine cars B61D 11/00; tramcars B61D 13/00)	7/14	• Adaptations of hopper elements to railways
1/02	• General arrangements in sleeping or couchette carriages (B61D 1/08 takes precedence)	7/16	• • Closure elements for discharge openings
1/04	• General arrangements of seats (B61D 1/06 takes precedence; seats <i>per se</i> B61D 33/00)	7/18	• • • pivoted
1/06	• with multiple deck arrangement	7/20	• • • sliding
1/08	• • of sleeping carriages	7/22	• • • Sealing means thereof
<b>3/00</b>	<b>Wagons or vans</b> (tank wagons B61D 5/00; hopper wagons B61D 7/00; tipping wagons B61D 9/00; mine cars B61D 11/00; vehicles adapted for animal transportation B60P 3/04)	7/24	• • • Opening or closing means
3/02	• with multiple deck arrangements (for carrying vehicles B61D 3/18) [4]	7/26	• • • • mechanical
3/04	• with movable floors, e.g. rotatable or floors which can be raised or lowered	7/28	• • • • hydraulic or pneumatic
3/06	• Flat-bottomed cars convertible into hoppers	7/30	• • • • controlled by means external to cars
3/08	• Flat wagons including posts or standards	7/32	• • Means for assisting charge or discharge
3/10	• Articulated vehicles	<b>9/00</b>	<b>Tipping wagons</b>
3/12	• • comprising running gear interconnected by loads	9/02	• characterised by operating means for tipping
3/14	• • comprising running gear interconnected by load supports facilitating low-level load transport	9/04	• Adaptations of rail vehicle elements to tipping wagons
3/16	• adapted for carrying special loads [4]	9/06	• • Bodies
3/18	• • for vehicles [4]	9/08	• • Frames; Supporting or guiding means for the bodies
3/20	• • for forwarding containers [4]	9/10	• • Devices preventing overturning when tipping
<b>5/00</b>	<b>Tank wagons for carrying fluent materials</b> (tank aspects B65D 88/00, B65D 90/00, F17C)	9/12	• • Body fitments or devices facilitating or controlling outflow on discharge
5/02	• having more than one tank	9/14	• Tipping systems controlled by trackside means
5/06	• Mounting of tanks; Integral bodies and frames	<b>11/00</b>	<b>Mine cars</b> (B61D 5/00-B61D 9/00 take precedence)
<b>7/00</b>	<b>Hopper cars</b> (flat-bottomed cars convertible into hoppers B61D 3/06) [2]	11/02	• Body construction
7/02	• with discharge openings in the bottoms (with body in two halves and discharge by tipping the halves B61D 9/00)	<b>13/00</b>	<b>Tramway vehicles</b>
7/04	• • the openings being above axle level during discharge	13/02	• Double-deckers
7/06	• with openings capable of discharging both between and outside the wheels	<b>15/00</b>	<b>Other railway vehicles, e.g. scaffold cars; Adaptations of vehicles for use on railways</b> (conveyer frames mounted for movement on rail tracks B65G 41/02; wheeled machines used in permanent-way construction or maintenance E01B)
7/08	• with openings capable of discharging only outside the wheels	15/02	• Breakdown cranes (crane gear B66C)
7/10	• • the discharge being assisted by tipping the bottom	15/04	• convertible into other non-vehicular apparatus, e.g. exhibition stands
7/12	• the hoppers being movable (B61D 9/00 takes precedence)	15/06	• Buffer cars; Arrangements or construction of railway vehicles for protecting them in case of collisions (buffers B61G 11/00)
		15/08	• Railway inspection trolleys
		15/10	• • hand or foot-propelled
		15/12	• • power-propelled

## B61D

### Body details of railway or tramway vehicles

- 17/00 Construction details of vehicle bodies** (for tank wagons B61D 5/00; for hopper cars B61D 7/00; body details specially adapted for tipping wagons B61D 9/06; for mine cars B61D 11/00)
- 17/02 • reducing air resistance by modifying contour
- 17/04 • with bodies of metal; with composite, e.g. metal and wood, body structures
- 17/06 • • End walls
- 17/08 • • Sides
- 17/10 • • Floors
- 17/12 • • Roofs (movable or foldable roofs, covers, or tarpaulins B61D 39/00)
- 17/14 • • • with gangways
- 17/16 • • • Hatches in roofs
- 17/18 • • Internal lining, e.g. insulating
- 17/20 • • Communication passages between coaches; Adaptation of coach ends therefor
- 17/22 • • • flexible, e.g. bellows
- 17/24 • with body structures of wood
- 17/26 • with body structures of concrete
- 19/00 Door arrangements peculiar to rail vehicles** (vehicle door arrangements in general B60J; vehicle locks E05B 65/12; door-operating mechanisms E05F)
- 19/02 • for carriages
- 23/00 Construction of steps for railway vehicles** (ladders in general E06C)
- 23/02 • Folding steps for railway vehicles
- 25/00 Window arrangements peculiar to rail vehicles** (vehicle window arrangements in general B60J; cleaning vehicle windows B60S; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84)

### Heating, cooling, ventilating, lighting, or air-conditioning, peculiar to rail vehicles

- 27/00 Heating, cooling, ventilating, or air-conditioning**
- 29/00 Arrangement of lighting devices for rail vehicles**

### Furniture or furnishings peculiar to rail vehicles

- 31/00 Sleeping accommodation**
- 33/00 Seats**
- 35/00 Sanitation**
- 37/00 Other furniture or furnishings**

### Other details peculiar to rail vehicles

- 39/00 Wagon or like covers; Tarpaulins; Movable or foldable roofs**
- 41/00 Indicators for reserved seats; Warning or like signs; Devices or arrangements in connection with tickets, e.g. ticket holders; Holders for cargo tickets or the like**
- 41/02 • Holders or devices for cargo tickets or the like
- 41/04 • Indicators for reserved seats
- 41/06 • Holders for fare tickets
- 43/00 Devices for using the energy of the movements of the vehicles**
- 45/00 Means or devices for securing or supporting the cargo, including protection against shocks**
- 47/00 Loading or unloading devices combined with vehicles, e.g. loading platforms** (combined with vehicles in general B60P)
- 49/00 Other details**

## **B61F RAIL VEHICLE SUSPENSIONS, e.g. UNDERFRAMES, BOGIES, ARRANGEMENTS OF WHEEL AXLES; RAIL VEHICLES FOR USE ON TRACKS OF DIFFERENT WIDTH; PREVENTING DERAILING; WHEELS GUARDS; OBSTRUCTION REMOVERS OR THE LIKE** (for vehicles in general B60; axles, wheels B60B; vehicle tyres B60C)

### Subclass index

#### FRAMES, RUNNING GEAR

- Underframes, bogies, connections therebetween.....1/00, 3/00, 5/00
- For different gauges.....7/00
- For preventing derailment.....9/00
- Track-engaging means other than wheels.....11/00

#### WHEEL ARRANGEMENTS.....13/00

#### AXLE-BOXES; FORM, MOUNTING; LUBRICATION THEREOF.....15/00, 5/00, 17/00

#### WHEEL GUARDS, BUMPERS, OBSTRUCTION REMOVERS.....19/00

#### SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

- 1/00 Underframes** (making railway vehicle underframes by forging or pressing B21K 7/12)
- 1/02 • with a single central sill
- 1/04 • of triangulated type
- 1/06 • specially adapted for locomotives or motor-driven railcars
- 1/08 • Details

- 1/10 • • End constructions
- 1/12 • • Cross bearers
- 1/14 • • Attaching or supporting vehicle body structure
- 3/00 Types of bogies** (B61F 5/00 takes precedence)
- 3/02 • with more than one axle
- 3/04 • • with driven axles or wheels

3/06	• • • with three or more axles	11/00	<b>Rail vehicles characterised by rail-engaging elements other than wheels, e.g. balls</b>
3/08	• • without driven axles or wheels		
3/10	• • • with three or more axles	13/00	<b>Rail vehicles characterised by wheel arrangements, not otherwise provided for</b>
3/12	• specially modified for carrying adjacent vehicle bodies of articulated trains		
3/14	• specially modified for reducing air resistance	15/00	<b>Axle-boxes</b> (mounting or securing axle-boxes B61F 5/26; lubrication B61F 17/00; bearings in general F16C)
3/16	• with a separate axle for each wheel	15/02	• with journal bearings
5/00	<b>Constructional details of bogies; Connections between bogies and vehicle underframes; Arrangements or devices for adjusting or allowing self-adjustment of wheel axles or bogies when rounding curves</b>	15/04	• • for locomotives
5/02	• Arrangements permitting limited transverse relative movements between vehicle underframe or bolster and bogie; Connections between underframes and bogies	15/06	• • for cars
5/04	• • Bolster supports or mountings (side bearings B61F 5/14)	15/08	• • the axle being slidable or tiltable in the bearings
5/06	• • • incorporating metal springs	15/10	• • • and having springs opposing such movements
5/08	• • • incorporating rubber springs	15/12	• with roller, needle, or ball bearings
5/10	• • • incorporating fluid springs	15/14	• • constructed for taking-up axial pressure
5/12	• • • incorporating dampers	15/16	• • the axle being slidable or tiltable in the bearings
5/14	• • Side bearings	15/18	• • • and having springs opposing such movements
5/16	• • Centre bearings or other swivel connections between underframes and bolsters or bogies	15/20	• Details
5/18	• • • King-bolts	15/22	• • Sealing means preventing entrance of dust or leakage of oil
5/20	• • • with springs allowing transverse movements	15/24	• • • preventing oil leakage when vehicle is tilted or inverted
5/22	• • Guiding of the vehicle underframes with respect to the bogies	15/26	• • Covers; Sealing thereof
5/24	• • • Means for damping or minimising the canting, skewing, pitching, or plunging movements of the underframes	15/28	• • Axle-boxes modified to ensure electrical conductivity
5/26	• Mounting or securing axle-boxes in vehicle or bogie underframes	17/00	<b>Lubrication specially adapted for axle-boxes of rail vehicles</b> (lubrication in general F16N)
5/28	• • Axle-boxes integral with, or directly secured to, vehicle or bogie underframes	17/02	• with oil
5/30	• • Axle-boxes mounted for movement under spring control in vehicle or bogie underframes	17/04	• • Lubrication by stationary devices
5/32	• • • Guides, e.g. plates, for axle-boxes	17/06	• • • by means of a wick or the like
5/34	• • • • Wedge mechanisms for adjusting clearance between underframes and axles	17/08	• • • • Devices for pressing the wick or the like against the rotating axle
5/36	• • • Arrangements for equalising or adjusting the load on wheels or springs, e.g. yokes	17/10	• • • by means of an oil bath
5/38	• Arrangements or devices for adjusting or allowing self-adjustment of wheel axles or bogies when rounding curves, e.g. sliding axles, swinging axles	17/12	• • • by gravity
5/40	• • Bogies with side frames mounted for longitudinal relative movements	17/14	• • Rotating lubricating devices
5/42	• • Adjustment controlled by buffer or coupling gear	17/16	• • • with rings
5/44	• • Adjustment controlled by movements of vehicle body	17/18	• • • with chains
5/46	• • Adjustment controlled by a sliding axle under the same vehicle underframe	17/20	• • • with scoops or the like attached to, or coupled with, the axle
5/48	• • Trailing or leading bogies for locomotives or motor-driven railcars (B61F 5/40 takes precedence) [2]	17/22	• • • with discs, rollers, or belts engaging the axle
5/50	• Other details	17/24	• • by built-in lubricating pumps
5/52	• • Bogie frames	17/26	• • by external feeding means, e.g. pneumatic devices
7/00	<b>Rail vehicles equipped for use on tracks of different width</b>	17/28	• • Applications of oil cleaners not otherwise provided for
9/00	<b>Rail vehicles characterised by means for preventing derailling, e.g. by use of guide wheels</b>	17/30	• with grease
		17/32	• • by manually-operated lubricators, e.g. screw cups
		17/34	• • by automatic means, e.g. with spring action
		17/36	• with other, e.g. mixed, lubricating agents
		19/00	<b>Wheel guards; Bumpers; Obstruction removers or the like</b> (for vehicles in general B60R 19/00)
		19/02	• Wheel guards
		19/04	• Bumpers or like collision guards
		19/06	• Nets, catchers, or the like for catching obstacles or removing them from the track (mailbag catchers B61K 1/02)
		19/08	• • of the drop-down type
		19/10	• • • automatically operated by engagement with obstacle
		99/00	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>

## B61G COUPLINGS SPECIALLY ADAPTED FOR RAILWAY VEHICLES; DRAUGHT OR BUFFING APPLIANCES SPECIALLY ADAPTED FOR RAILWAY VEHICLES

### Couplings peculiar to railway vehicles

#### **1/00 Couplings comprising interengaging parts of different shape or form and having links, bars, pins, shackles, or hooks as coupling means**

- 1/02 • having links or bars coupling or uncoupling by rotating around a transverse horizontal axis
- 1/04 • • Operating devices therefor (B61G 1/08 takes precedence)
- 1/06 • • and coupling when the coupling halves are pushed together
- 1/08 • • • Control devices therefor
- 1/10 • having links or bars coupling or uncoupling by rotating around a vertical axis
- 1/12 • • Operating devices therefor (B61G 1/16 takes precedence)
- 1/14 • • and coupling when the coupling halves are pushed together
- 1/16 • • • Control devices therefor
- 1/18 • having links or bars coupling or uncoupling by rotating axially
- 1/20 • • Operating devices therefor
- 1/22 • having screws incorporated in the links for lengthening or shortening the couplings
- 1/24 • • Operating devices therefor (B61G 1/26 takes precedence)
- 1/26 • • and coupling when the coupling halves are pushed together; Control devices therefor
- 1/28 • with vertical bolt or pin
- 1/30 • • Operating devices therefor
- 1/32 • with horizontal bolt or pin
- 1/34 • • Operating devices therefor
- 1/36 • with shackles and hooks, e.g. specially adapted for mine cars
- 1/38 • • rotatable about line of traction, e.g. for cars which are tiltable when coupled
- 1/40 • with coupling bars having an enlarged or recessed end which slips into the opposite coupling part and is gripped thereby, e.g. arrow-head type; with coupling parts having a tong-like gripping action
- 1/42 • • Operating devices therefor

#### **3/00 Couplings comprising mating parts of similar shape or form which can be coupled without the use of any additional element or elements**

- 3/02 • with interengaging movably-mounted hooks or links guided into alignment by a gathering device, e.g. "Dowty" type
- 3/04 • with coupling head having a guard arm on one side and a knuckle with angularly-disposed nose and tail portions pivoted to the other side thereof, the nose of the knuckle being the coupling part, and means to lock the knuckle in coupling position, e.g. "A.A.R." or "Janney" type
- 3/06 • • Knuckle-locking devices
- 3/08 • • Control devices, e.g. for uncoupling
- 3/10 • with coupling heads in the form of hook-like interengaging rigid jaws, e.g. "Willison" type
- 3/12 • • Jaw-locking devices
- 3/14 • • Control devices, e.g. for uncoupling

- 3/16 • with coupling heads rigidly connected by rotatable hook plates or discs and balancing links, the coupling members forming a parallelogram, e.g. "Scharfenberg" type
- 3/18 • • Locking devices
- 3/20 • • Control devices, e.g. for uncoupling
- 3/22 • with coupling heads rigidly connected by locks consisting of pivoted latches
- 3/24 • • Latch-locking devices
- 3/26 • • Control devices, e.g. for uncoupling
- 3/28 • with coupling heads rigidly connected by locks consisting of slidable pins
- 3/30 • with coupling heads rigidly connected by pins having locking noses which are brought into locking position by rotating the pins

#### **5/00 Couplings not otherwise provided for**

- 5/02 • for coupling articulated trains, locomotives and tenders, or the bogies of a vehicle; Coupling by means of a single coupling bar; Couplings preventing or limiting relative lateral movement of vehicles
- 5/04 • for matching couplings of different types, e.g. transitional couplings
- 5/06 • for, or combined with, couplings or connectors for fluid conduits or electric cables
- 5/08 • • for fluid conduits
- 5/10 • • for electric cables

#### **7/00 Details or accessories**

- 7/02 • Hand tools for coupling or uncoupling
- 7/04 • Coupling or uncoupling by means of trackside apparatus
- 7/06 • Coupling heads constructed to facilitate alignment
- 7/08 • Adjustable coupling heads
- 7/10 • Mounting of the couplings on the vehicle
- 7/12 • • Adjustable coupling bars, e.g. for centralisation purposes
- 7/14 • Safety devices

### Draught or buffing appliances peculiar to railway or tramway vehicles

#### **9/00 Draw-gear**

- 9/02 • Draw-gear and non-integral buffing appliances with combined action or acting on the same spring
- 9/04 • Draw-gear combined with buffing appliances (continuous B61G 9/12)
- 9/06 • • with rubber springs
- 9/08 • • with fluid springs or fluid shock-absorbers; Combinations thereof
- 9/10 • • with separate mechanical friction shock-absorbers
- 9/12 • Continuous draw-gear combined with buffing appliances, e.g. incorporated in a centre sill
- 9/14 • • with rubber springs
- 9/16 • • with fluid springs or fluid shock-absorbers; Combinations thereof
- 9/18 • • with separate mechanical friction shock-absorbers
- 9/20 • Details; Accessories
- 9/22 • • Supporting framework, e.g. cradles; Spring housings

9/24	• • Linkages between draw-bar and framework (adjustable coupling bars B61G 7/12)	11/10	• with combined rubber and metal springs
<b>11/00</b>	<b>Buffers</b> (springs F16F)	11/12	• with fluid springs or shock-absorbers; Combinations thereof
11/02	• with metal springs	11/14	• absorbing shocks by mechanical friction action; Combinations of mechanical shock-absorbers and springs (B61G 11/06 takes precedence)
11/04	• • with helical springs	11/16	• absorbing shocks by permanent deformation of buffer element
11/06	• • • arranged to damp each other by mutual friction	11/18	• Details
11/08	• with rubber springs		

**B61H BRAKES OR OTHER RETARDING APPARATUS PECULIAR TO RAIL VEHICLES; ARRANGEMENTS OR POSITIONS OF BRAKES OR OTHER RETARDING APPARATUS IN RAIL VEHICLES** (electrodynamic braking of vehicles B60L, in general H02K; arrangements in rail vehicles for adjusting wheel-braking force to meet varying vehicular or permanent-way conditions B60T 8/00; transmitting braking action from initiating means to ultimate brake actuator with power assistance or drive, brake systems incorporating such transmitting means, e.g. air-pressure brake systems, B60T 13/00; construction, arrangement, or operation of valves incorporated in power brake systems B60T 15/00; component parts, details, or accessories of brake systems B60T 17/00; brakes in general F16D)

#### Subclass index

BRAKES ACTING ON TRACK; BRAKES FOR SPECIAL PURPOSES.....	7/00, 9/00
ARRANGEMENTS OF BRAKES	
Acting on wheels.....	1/00, 3/00, 5/00
Other arrangements, combinations.....	11/00
ACTUATION.....	13/00
COMPENSATING FOR WEAR.....	15/00

<b>1/00</b>	<b>Applications or arrangements of brakes with a braking member or members co-operating with the periphery of the wheel rim, a drum, or the like</b> (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14; wheels B60B)	11/02	• of self-applying brakes
		11/04	• • with brake-applying force derived from rotation of axle
		11/06	• of hydrostatic, hydrodynamic, or aerodynamic brakes
		11/08	• • comprising a pump or the like circulating fluid, braking being effected by throttling of the circulation
<b>3/00</b>	<b>Applications or arrangements of brakes with an outwardly-movable braking member or members co-operating with the inner surface of a drum or the like</b> (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14)	11/10	• • Aerodynamic brakes with control flaps, e.g. spoilers, attached to the vehicles
		11/14	• Combinations of different types of brakes, e.g. brake blocks acting on wheel-rim combined with disc brakes
<b>5/00</b>	<b>Applications or arrangements of brakes with substantially-radial braking surfaces pressed together in axial direction, e.g. disc brakes</b> (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14)	11/16	• Removable self-contained brake units
		<b>13/00</b>	<b>Actuating rail-vehicle brakes</b> (self-applying brakes B61H 11/02; wear-compensating mechanisms B61H 15/00)
<b>7/00</b>	<b>Brakes with braking members co-operating with the track</b> (positive railway stops or track brakes secured to permanent way B61K 7/00)	13/02	• Hand or other personal actuation
		13/04	• • by mechanisms incorporating toothed gearing
7/02	• Scotch-blocks, skids, or like track-engaging shoes	13/06	• Actuating or influencing the brakes by backward-pressure of buffers or coupling gear, e.g. buffer brakes
7/04	• • attached to railway vehicles		
7/06	• • • Skids	13/20	• Transmitting mechanisms (wear-compensating mechanisms B61H 15/00)
7/08	• • • • electromagnetically operated	13/22	• • for braking a single wheel or wheels at one side only, e.g. for locomotives or motor railcars
7/10	• • unattached	13/24	• • for cars with two axles or bogies with two axles and braking cylinder(s) for each bogie, the mechanisms at each side being interconnected
7/12	• Grippers co-operating frictionally with tracks	13/26	• • for cars or bogies with more than two axles or bogies, the mechanisms at each side being interconnected
<b>9/00</b>	<b>Brakes characterised by, or modified for, their application to special railway systems or purposes</b>	13/28	• • with variable leverage or mechanical advantage to obtain quick take-up
9/02	• for aerial, e.g. rope, railways	13/30	• • adjustable to take account of variation of vehicle weight (arrangements for adjusting wheel-braking force in response to vehicle weight or load B60T 8/18)
9/04	• for preventing or controlling movement in one direction or, selectively, in either direction		
9/06	• for storing energy during braking action		
<b>11/00</b>	<b>Applications or arrangements of braking or retarding apparatus not otherwise provided for; Combinations of apparatus of different kinds or types</b>		

## B61H

- 13/32 • • • by varying brake lever leverage
- 13/34 • Details
- 13/36 • • Beams; Suspension thereof

- 13/38 • • Suspension of transmitting mechanisms (B61H 13/36 takes precedence)

## 15/00 Wear-compensating mechanisms, e.g. slack adjusters

## B61J SHIFTING OR SHUNTING OF RAIL VEHICLES (shifting vehicles in general B60S; marshalling systems B61B)

### 1/00 Turntables; Traversers; Transporting rail vehicles on other rail vehicles or dollies (shunting B61J 3/00)

- 1/02 • Turntables; Integral stops
- 1/04 • • of normal railroad type
- 1/06 • • for railways with suspended vehicles, e.g. aerial rope railways
- 1/08 • • for connecting inclined tracks or tracks of different height (wagon elevators B66)
- 1/10 • Traversers
- 1/12 • Rollers or devices for shifting or transporting rail vehicles on rails

### 3/00 Shunting or short-distance haulage devices; Similar devices for hauling trains on steep gradients or as starting aids; Car-propelling devices therefor (overhead travelling cranes combined with auxiliary means for shunting railway vehicles B66C 17/26; capstans B66D)

- 3/02 • Gravity shunting humps (track brakes or retarding apparatus fixed to permanent way B61K 7/02)
- 3/04 • Car-shunting or haulage devices with cable traction or endless-chain driving means
- 3/06 • • with vehicle-engaging truck or carriage
- 3/08 • Devices with reciprocated pushing bars or like driving mechanisms combined with the track for shunting or hauling cars (railway systems of this kind B61B 13/12)
- 3/10 • Car-shunting or positioning devices with pinchbar action (pinchbars, crowbars in general B66F 15/00)
- 3/12 • Self-propelled tractors or pushing vehicles, e.g. mules (with cable traction B61J 3/06)

## 99/00 Subject matter not provided for in other groups of this subclass [2006.01]

## B61K OTHER AUXILIARY EQUIPMENT FOR RAILWAYS (energy-storing brakes B61H; protection of permanent way against weather influences E01B; rail cleaning, snow ploughs E01H)

### Subclass index

#### EQUIPMENT RELATED TO TRACK

Wetting or lubricating; testing; stops, retarding; other.....3/00, 9/00, 7/00, 13/00

#### EQUIPMENT RELATED TO VEHICLES

Transferring load, coupling, or slipping, during movement; profile gauges; derailling, re-railing.....1/00, 9/00, 5/00

Wetting or lubrication of wheels; testing.....3/00, 9/00

Servicing locomotives.....11/00

Other.....13/00

### 1/00 Transferring passengers, articles, or freight to and from moving trains; Slipping or coupling vehicles from or to moving trains

- 1/02 • transferring articles to and from moving trains, e.g. mailbag catchers

### 3/00 Wetting or lubricating rails or wheel flanges

- 3/02 • Apparatus therefor combined with vehicles

### 5/00 Apparatus for placing vehicles on the track; Derailers; Lifting or lowering rail vehicle axles or wheels (hoisting apparatus B66)

- 5/02 • Devices secured to the vehicles; Turntables integral with the vehicles
- 5/04 • Devices secured to the track
- 5/06 • • Derailling or re-railing blocks

### 7/00 Railway stops fixed to permanent way; Track brakes or retarding apparatus fixed to permanent way; Sand tracks or the like (skids, wedges, vehicle-mounted scotch blocks B61H; operating mechanisms for track-mounted scotch-blocks B61L)

- 7/02 • Track brakes or retarding apparatus
- 7/04 • • with clamping action

- 7/06 • • • operated mechanically
- 7/08 • • • operated pneumatically or hydraulically
- 7/10 • • electrodynamic (on vehicles B60L)
- 7/12 • • electrically controlled
- 7/14 • Sand or like tracks
- 7/16 • Positive railway stops
- 7/18 • • Buffer stops
- 7/20 • • Positive wheel stops
- 7/22 • • Axle stops

### 9/00 Railway vehicle profile gauges; Detecting or indicating overheating of components; Apparatus on locomotives or cars to indicate bad track sections; General design of track recording vehicles

- 9/02 • Profile gauges, e.g. loading gauges
- 9/04 • Detectors for indicating the overheating of axle bearings and the like, e.g. associated with the brake system for applying the brakes in case of a fault
- 9/06 • • by detecting or indicating heat radiation from overheated axles
- 9/08 • Measuring installations for surveying permanent way (applications of measuring apparatus or devices for track-building purposes E01B 35/00; measuring techniques G01)

9/10	• • for detecting cracks in rails or welds thereof	11/02	• Water columns for locomotives
9/12	• Measuring or surveying wheel-rims (measuring techniques G01)	<b>13/00</b>	<b>Other auxiliaries or accessories for railways</b> (safety belts or body harnesses A62B 35/00)
<b>11/00</b>	<b>Serving peculiar to locomotives, e.g. filling with, or emptying of, water, sand, or the like at the depots</b> (lifting or lowering axles or wheels B61K 5/00; filling stations for steam or pneumatic accumulator locomotives B61C 8/00; water or fuel supply fittings on locomotives B61C 17/02; refuelling locomotives with solid fuels B65G 67/18; washing or cleaning boilers F28G)	13/02	• Starting aids for cars amplifying the draw-bar pull and transmitting it to the wheels
		13/04	• Passenger-warning devices attached to vehicles; Safety devices for preventing accidents to passengers when entering or leaving vehicles
<b>B61L</b>	<b>GUIDING RAILWAY TRAFFIC; ENSURING THE SAFETY OF RAILWAY TRAFFIC</b> (power supply lines for electrically propelled vehicles B60M; arrangement of signalling devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q; brakes or auxiliary equipment B61H, B61K; point or crossing construction E01B; insulated rail joints E01B 11/54; optical devices in general G02; controlling in general G05; electric communication technique H04)		

**Note(s)**

This subclass covers:

- devices along the route interacting with trains;
- signals;
- operation of points and signals;
- interlocking;
- block systems;
- level crossings.

**Subclass index**

DEVICES ALONG THE ROUTE ACTUATED BY, OR ACTING ON, THE TRAIN AT ITS PASSAGE.....1/00, 3/00

RAILWAY SIGNALLING, SWITCHING, BLOCKING, AND INTERLOCKING

Signals

per se, local operation mechanisms; remote control; control by passage of vehicles.....5/00, 7/00, 13/00

Points

local operation mechanisms; remote control; control by passage of vehicles.....5/00, 7/00, 11/00

switching systems of classification yards.....17/00

points and signals interlocking by a single device.....19/00

Scotch-blocks: local operation mechanisms; remote control.....5/00, 7/00

Station blocking.....21/00

TRAFFIC

Central control systems; recording and indicating traffic data; self-signalling.....27/00, 25/00, 15/00

Safety: means concerning railway traffic; protection of road crossings.....23/00, 29/00

ILLUMINATION OF POINTS, FORM SIGNALS, AND GATES.....9/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

<b>1/00</b>	<b>Devices along the route controlled by interaction with the vehicle or vehicle train</b> (detonators B61L 5/20; operation of points or signals by passage of the vehicle B61L 11/00, B61L 13/00; central traffic control systems controlled by train B61L 27/04; operation of gates, or gates and signals, by approaching vehicle B61L 29/18)	1/16	• Devices for counting axles; Devices for counting vehicles (counting moving objects in general G06M)
1/02	• Electric devices associated with track	1/18	• Railway track circuits (automatically-operated track circuits specially adapted for section blocking for controlling traffic B61L 23/00; rail joints E01B 11/00)
1/04	• • mechanically actuated by a part of the vehicle	1/20	• Safety arrangements for preventing or indicating malfunction of the device, e.g. by leakage current, by lightning
1/06	• • actuated by deformation of rail; actuated by vibration in rail	<b>3/00</b>	<b>Devices along the route for controlling devices on the vehicle or vehicle train, e.g. to release brake, to operate a warning signal</b>
1/08	• • magnetically actuated; electrostatically actuated	3/02	• at selected places along the route, e.g. intermittent control
1/10	• • actuated by electromagnetic radiation; actuated by particle radiation	3/04	• • controlling mechanically
1/12	• Electric devices associated with overhead trolley wires	3/06	• • controlling by electromagnetic or particle radiation, e.g. by light beam (using radio waves B61L 3/12)
1/14	• Devices for indicating the passing of the end of the vehicle or vehicle train		

- 3/08 • • controlling electrically
- 3/10 • • • using current passing between devices along the route and devices on the vehicle train
- 3/12 • • • using magnetic or electrostatic induction; using radio waves
- 3/14 • • to cut-off the power supply to traction motors of electrically-propelled vehicles
- 3/16 • Continuous control along the route
- 3/18 • • using electric current passing between devices along the route and devices on the vehicle or vehicle train
- 3/20 • • • employing different frequencies or coded pulse groups
- 3/22 • • using magnetic or electrostatic induction; using electromagnetic radiation
- 3/24 • • • employing different frequencies or coded pulse groups

**5/00 Local operating mechanisms for points or track-mounted scotch-blocks** (track-mounted scotch-blocks per se B61K); **Visible or audible signals; Local operating mechanisms for visible or audible signals** (B61L 11/00 takes precedence)

- 5/02 • Mechanical devices for operating points or scotch-blocks
- 5/04 • Fluid-pressure devices for operating points or scotch-blocks
- 5/06 • Electric devices for operating points or scotch-blocks
- 5/08 • Underground actuating arrangements, e.g. for tramways
- 5/10 • Locking mechanisms for points; Means for indicating the setting of points
- 5/12 • Visible signals
- 5/14 • • Form signals, e.g. semaphore arms
- 5/16 • • • Local operating mechanisms for form signals
- 5/18 • • Light signals; Mechanisms associated therewith, e.g. blinders
- 5/20 • Audible signals, e.g. detonator
- 5/22 • • Devices for initiating the release of detonators in a certain position of a signal
- 5/24 • • Replacement of detonators

**7/00 Remote control of local operating means for points, signals, or track-mounted scotch-blocks** (B61L 11/00 takes precedence; interlocking arrangements B61L 19/00)

- 7/02 • using mechanical transmission, e.g. wire, lever
- 7/04 • using fluid-pressure transmission
- 7/06 • using electrical transmission
- 7/08 • • Circuitry
- 7/10 • • • for light signals, e.g. for supervision, back-signalling

**9/00 Illumination specially adapted for points, form signals, or gates** (lighting in general F21)

- 9/02 • non-electric
- 9/04 • electric

**11/00 Operation of points from the vehicle or by the passage of the vehicle**

- 11/02 • using mechanical interaction between vehicle and track
- 11/04 • • Trailable point locks
- 11/06 • • with fluid-pressure transmission
- 11/08 • using electrical or magnetic interaction between vehicle and track

**13/00 Operation of signals from the vehicle or by the passage of the vehicle**

- 13/02 • using mechanical interaction between vehicle and track
- 13/04 • using electrical or magnetic interaction between vehicle and track

**15/00 Indicators provided on the vehicle or vehicle train for signalling purposes**

- 15/02 • Head or tail indicators, e.g. light

**17/00 Switching systems for classification yards** (rail brakes B61K)

- 17/02 • Details, e.g. indicating degree of track filling

**19/00 Arrangements for interlocking between points and signals by means of a single interlocking device** (station block arrangements B61L 21/00)

- 19/02 • Interlocking devices having mechanical or fluid-pressure operation
- 19/04 • • Details, e.g. hand lever, back-signalling device
- 19/06 • Interlocking devices having electrical operation
- 19/08 • • Special arrangements for power supply for interlocking devices
- 19/10 • • with mechanical locks
- 19/12 • • • Details
- 19/14 • • with electrical locks
- 19/16 • • • Details

**21/00 Station blocking between signal boxes in one yard** (interlocking between points and signals by means of a single interlocking device B61L 19/00)

- 21/02 • Mechanical locking and release of the route; Repeat locks; Coupling of semaphores
- 21/04 • Electrical locking and release of the route; Electrical repeat locks
- 21/06 • Vehicle-on-line indication; Monitoring locking and release of the route
- 21/08 • Order transmission and reception arrangements for giving or withholding permission
- 21/10 • Arrangements for trains which are closely following one another (automatic central traffic control systems B61L 27/04)

**23/00 Control, warning or like safety means along the route or between vehicles or vehicle trains [4]**

- 23/02 • for indicating along the route the failure of brakes
- 23/04 • for monitoring the mechanical state of the route
- 23/06 • for warning men working on the route
- 23/08 • for controlling traffic in one direction only (station blocking between signal boxes in one yard B61L 21/00)
- 23/10 • • manually operated
- 23/12 • • partly operated by train
- 23/14 • • automatically operated
- 23/16 • • • Track circuits specially adapted for section blocking
- 23/18 • • • specially adapted for maintaining a safe distance between vehicles or vehicle trains depending upon speed and traffic density [1, 2006.01]
- 23/20 • • • with transmission of instructions to stations along the route
- 23/22 • for controlling traffic in two directions over the same pair of rails (station blocking between signal boxes in one yard B61L 21/00)
- 23/24 • • using token systems, e.g. train staffs, tablets



23/26	• • with means for actuating signals from the vehicle or by passage of the vehicle	29/02	• Guards or obstacles for preventing access to the route (cattle guards connected to the permanent way E01B 17/00)
23/28	• • using non-automatic blocking from a place along the route	29/04	• Gates for level crossings
23/30	• • using automatic section blocking	29/06	• • yielding to vehicles in one direction but operated in a different direction
23/32	• • • with provision for the blocking of passing sidings	29/08	• Operation of gates; Combined operation of gates and signals
23/34	• for indicating the distance between vehicles or vehicle trains by the transmission of signals therebetween [4]	29/10	• • Means for securing gates in their desired position
<b>25/00</b>	<b>Recording or indicating positions or identities of vehicles or vehicle trains or setting of track apparatus</b>	29/12	• • Manual operation
25/02	• Indicating or recording positions or identities of vehicles or vehicle trains	29/14	• • • mechanically
25/04	• • Indicating or recording train identities	29/16	• • • electrically
25/06	• Indicating or recording the setting of track apparatus, e.g. of points, of signals	29/18	• • Operation by approaching rail vehicle or rail vehicle train
25/08	• • Diagrammatic displays	29/20	• • • mechanically
<b>27/00</b>	<b>Central traffic control systems</b>	29/22	• • • electrically
27/02	• Manual systems	29/24	• Means for warning road traffic that a gate is closed or closing, or that rail traffic is approaching, e.g. for visible or audible warning
27/04	• Automatic systems, e.g. controlled by train; Change-over to manual control	29/26	• • mechanically operated
<b>29/00</b>	<b>Safety means for rail/road crossing traffic</b>	29/28	• • electrically operated
		29/30	• • • Supervision, e.g. monitoring arrangements
		29/32	• • • Timing, e.g. advance warning of approaching train
		<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>

## B62 LAND VEHICLES FOR TRAVELLING OTHERWISE THAN ON RAILS

**B62B HAND-PROPELLED VEHICLES, e.g. HAND CARTS OR PERAMBULATORS; SLEDGES** (characterised by animal propulsion B62C; propulsion of sledges by driver or engine B62M)

### Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "hand carts" also embraces hand-propelled wheeled devices in so far as the features thereof are generic to hand carts and also embraces pedestrian controlled power-driven vehicles in so far as the features thereof are generic to hand carts;
- "rollers" is equivalent to wheels.

### Subclass index

#### HAND CARTS

With one axle; with more than one axle.....1/00, 3/00

Details and accessories; runners for travel on ice or snow.....5/00, 19/00

CARRIAGES FOR CHILDREN, PERAMBULATORS.....7/00, 9/00

#### SLEDGES

With runners; other types.....13/00, 15/00

Details and accessories.....17/00

OTHER HAND-PROPELLED VEHICLES.....11/00

### Hand carts

#### **1/00 Hand carts having only one axis carrying one or more transport wheels; Equipment therefor**

1/02 • in which the wheel axis is disposed between the load and the handles

1/04 • • involving parts being adjustable, collapsible, attachable, detachable, or convertible

1/06 • • involving means for grappling or securing in place objects to be carried; Loading or unloading equipment

1/08 • • having auxiliary wheels used during loading or unloading

1/10 • in which the load is intended to be transferred totally to the wheels

1/12 • • involving parts being adjustable, collapsible, attachable, detachable, or convertible

## B62B

- 1/14 • • involving means for grappling or securing in place objects to be carried; Loading or unloading equipment
- 1/16 • • involving tiltably-mounted containers
- 1/18 • in which the load is disposed between the wheel axis and the handles, e.g. wheelbarrows
- 1/20 • • involving parts being collapsible, attachable, detachable or convertible
- 1/22 • • involving means for grappling or securing in place objects to be carried; Loading or unloading equipment
- 1/24 • • involving tiltably-mounted containers
- 1/26 • characterised by supports specially adapted to objects of definite shape

### 3/00 Hand carts having more than one axis carrying transport wheels; Steering devices therefor; Equipment therefor

- 3/02 • involving parts being adjustable, collapsible, attachable, detachable, or convertible (B62B 3/14 takes precedence) [6]
- 3/04 • involving means for grappling or securing in place objects to be carried; Load handling equipment
- 3/06 • • for simply clearing the load from the ground, e.g. low-lift trucks (devices movable on wheels or the like for lifting or lowering bulky or heavy goods for loading or unloading purposes, e.g. fork-lift trucks, B66F 9/06)
- 3/065 • • • with hydraulic lifting means [6]
- 3/08 • involving tiltably-mounted containers (B62B 3/14 takes precedence) [6]
- 3/10 • characterised by supports specially adapted to objects of definite shape
- 3/12 • characterised by three-wheeled construction (B62B 3/14 takes precedence) [6]
- 3/14 • characterised by provisions for nesting or stacking, e.g. shopping trolleys [6]
- 3/16 • • vertically stackable [6]
- 3/18 • • nestable by means of pivoted load supports or load support parts, e.g. baskets [6]

### 5/00 Accessories or details specially adapted for hand carts (B62B 9/00 takes precedence; wheels, axles, or axle bearings for vehicles B60B; castors for vehicles, castors in general B60B 33/00)

- 5/02 • providing for travelling up or down a flight of stairs (chairs or personal conveyances specially adapted for patients or disabled persons A61G 5/00)
- 5/04 • Braking mechanisms; Locking devices against movement
- 5/06 • Hand moving equipment, e.g. handle bars (for cycles B62K 11/14, B62K 21/12)
- 5/08 • Children's seats (B62B 3/14 takes precedence) [6]

## Carriages for children; Perambulators

### 7/00 Carriages for children; Perambulators, e.g. dolls' perambulators

- 7/02 • having only a single wheel axis
- 7/04 • having more than one wheel axis; Steering devices therefor
- 7/06 • • collapsible or foldable
- 7/08 • • • in the direction of, or at right angles to, the wheel axes
- 7/10 • • • by folding down the body to the wheel carriage or by retracting projecting parts into the box-shaped body

- 7/12 • • convertible, e.g. into children's furniture or toy (children's chairs convertible to push chairs A47D 1/06)
- 7/14 • • with detachable or rotatably-mounted body

### 9/00 Accessories or details specially adapted for children's carriages or perambulators (providing for travelling on snow B62B 19/00)

- 9/02 • providing for travelling up or down a flight of stairs
- 9/04 • • with runners, e.g. sledge runners
- 9/06 • • with spiders or the like
- 9/08 • Braking mechanisms; Locking devices against movement
- 9/10 • Perambulator bodies; Equipment therefor (collapsible or foldable B62B 7/06; convertible B62B 7/12)
- 9/12 • • involving parts that are adjustable, attachable or detachable
- 9/14 • • Hoods; Weather screens; Cat nets
- 9/16 • Mud-guards or protecting devices for wheels
- 9/18 • Resilient suspensions of bodies
- 9/20 • Handle bars; Handles
- 9/22 • Devices for rocking or oscillating
- 9/24 • Safety guards for children, e.g. harness (cat nets B62B 9/14; devices for use in guiding or supporting children, e.g. safety harness, A47D 13/08)
- 9/26 • Securing devices for bags or toys
- 9/28 • Auxiliary dismountable seats

### 11/00 Hand-propelled vehicles not otherwise provided for (rider propulsion of vehicles B62M 1/00, B62M 6/00)

## Sledges

### 13/00 Sledges with runners (ice boats or sailing sledges B62B 15/00)

- 13/02 • characterised by arrangement of runners
- 13/04 • • arranged in a single line
- 13/06 • • arranged in two or more parallel lines
- 13/08 • • • with steering devices
- 13/10 • • • • with swivelling portions of the runners; with a swivelling middle runner
- 13/12 • • • • with tilting or bending runners
- 13/14 • • • • combined with braking devices
- 13/16 • Collapsible or foldable sledges
- 13/18 • Vehicles having alternatively-usable runners and wheels

### 15/00 Other sledges; Ice boats or sailing sledges

### 17/00 Accessories or details of sledges

- 17/02 • Runners (attachable to, or replacing, vehicle wheels B62B 19/00)
- 17/04 • • resiliently suspended
- 17/06 • Superstructures; Attachments therefor
- 17/08 • Braking devices

### 19/00 Runners for carrying wheeled vehicles to facilitate travel on ice or snow

- 19/02 • attachable to wheels
- 19/04 • replacing wheels

**B62C VEHICLES DRAWN BY ANIMALS****Note(s)**

1. This subclass covers only vehicles or parts thereof in so far as the relevant features are essential for animal-drawn vehicles.
2. This subclass does not cover animal-drawn vehicles which have not the features mentioned in Note (1) above. They are regarded as trailers which are covered by class B60 or subclass B62D, or as sledges which are covered by subclass B62B.

<b>1/00</b>	<b>Types of vehicles</b>	<b>7/00</b>	<b>Braking mechanisms and brake control devices specially adapted for animal-drawn vehicles</b>
1/02	• Passenger vehicles	7/02	• Mechanisms for locking ground-engaging wheels, e.g. engaging spokes
1/04	• Load-carrying vehicles	7/04	• Automatic brake control devices
1/06	• • convertible, e.g. with extensible parts, with changeable wheel track		
1/08	• Racing vehicles, e.g. sulkies		
<b>3/00</b>	<b>Undercarriages or running gear of vehicles; Axle supports</b> (undercarriages for supporting agricultural tools or apparatus A01B 35/30, A01B 39/24, A01B 51/00)	<b>9/00</b>	<b>Carriers or holders for whips; Holders for reins forming part of, or attached to, vehicles</b> (reins or whips <u>per se</u> B68B)
3/02	• Front wheel carriers; Bogies; Steering mechanisms for bogies	<b>11/00</b>	<b>Safeguarding appliances not otherwise provided for, e.g. for readily-releasing unmanageable draught animals</b>
<b>5/00</b>	<b>Draught assemblies</b> (traction harness B68B 3/00)	11/02	• Providing for disengaging thills
5/02	• Shafts, poles, or thills; Mountings thereof, e.g. resilient, adjustable	11/04	• • combined with automatic braking
5/04	• Swingletrees; Mountings thereof; Draught equalisers for a span of draught animals; Mountings for traces	<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2009.01]</b>

**B62D MOTOR VEHICLES; TRAILERS** (steering, or guiding on a desired track, of agricultural machines or implements A01B 69/00; wheels, castors, axles, increasing wheel adhesion B60B; vehicle tyres, tyre inflation or tyre changing B60C; connections between vehicles of a train or the like B60D; vehicles for use on rail and road, amphibious or convertible vehicles B60F; suspension arrangements B60G; heating, cooling, ventilating or other air treating devices B60H; windows, windscreens, non-fixed roofs, doors or similar devices, protective coverings for vehicles not in use B60J; propulsion plant arrangements, auxiliary drives, transmissions, controls, instrumentation or dashboards B60K; electric equipment or propulsion of electrically-propelled vehicles B60L; power supply for electrically-propelled vehicles B60M; passenger accommodation not otherwise provided for B60N; adaptations for load transportation or to carry special loads or objects B60P; arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q; vehicles, vehicle fittings or vehicle parts, not otherwise provided for B60R; servicing, cleaning, repairing, supporting, lifting, or manoeuvring, not otherwise provided for B60S; brake arrangements, brake control systems or parts thereof B60T; air-cushion vehicles B60V; motorcycles, accessories therefor B62J, B62K; testing of vehicles G01M)

**Note(s)**

In this subclass, the following terms are used with the meanings indicated:

- "vehicles" includes motor vehicles and trailers;
- "trailers" includes forecars or sidecars.

**Subclass index**
**FUNCTIONAL OR STRUCTURAL CHARACTERISTICS; PARTS OR ACCESSORIES THEREOF NOT OTHERWISE PROVIDED FOR**

Predominantly for passengers; load carrying.....	31/00, 47/00, 33/00
Tractors; tractor-trailer combinations or road trains; vehicles with no seat for the driver.....	49/00, 53/00, 51/00
Endless-track vehicles and their tracks; vehicles with ground engagement other than by tracks or wheels	55/00, 57/00
Trailers with driven ground wheels; Motor vehicles or trailers, characterised by the arrangement or number of wheels.....	59/00, 61/00
Other types of vehicles; designing, manufacturing, assembling, disassembling of vehicles.....	63/00, 65/00, 67/00

**CHASSIS FRAME, SUPERSTRUCTURE, AND BODY**

Chassis frame; monocoque construction; connections between body and frame.....	21/00, 23/00, 24/00
Superstructure and body characterised	
by material.....	29/00
the function of the vehicle.....	31/00, 33/00
streamlining; stabilising.....	35/00, 37/00, 17/00
superstructure sub-units and connections thereof; arrangements for spare wheel.....	25/00, 27/00, 43/00

radius rods.....	19/00
other vehicle bodies.....	39/00
<b>STEERING</b>	
Initiating means; gears; response to driving conditions; linkage; adjusting.....	1/00, 3/00, 6/00, 7/00, 17/00
Power-assisted; automatically influencing; for endless-track vehicles; for trailers.....	5/00, 6/00, 11/00, 13/00
Tandem vehicles or pivotally connected frames.....	12/00
Other.....	9/00, 11/00, 15/00
<b>ACCESSORIES FOR COLLISION MARKING</b> .....	41/00

### **Steering of motor vehicles or trailers [3]**

#### **1/00 Steering controls, i.e. means for initiating a change of direction of the vehicle [4, 5]**

- 1/02 • vehicle-mounted
- 1/04 • • Hand wheels
- 1/06 • • • Rims, e.g. with heating means; Rim covers (B62D 1/11 takes precedence) [5]
- 1/08 • • • Spokes, e.g. resilient (B62D 1/11 takes precedence) [5]
- 1/10 • • • Hubs; Connecting hubs to steering columns, e.g. adjustable (B62D 1/11 takes precedence) [5]
- 1/11 • • • incorporating energy-absorbing arrangements, e.g. by being yieldable or collapsible (padded linings associated with the steering wheel B60R 21/05; shock absorbers using plastic deformation of members in general F16F 7/12) [5]
- 1/12 • • Hand levers
- 1/14 • • • Tillers, i.e. hand levers operating on steering columns
- 1/16 • • Steering columns
- 1/18 • • • yieldable or adjustable, e.g. tiltable (padded linings associated with the steering column B60R 21/05)

#### **Note(s)**

Group B62D 1/181 takes precedence over groups B62D 1/183-B62D 1/187.

- 1/181 • • • • with power actuated adjustment, e.g. with position memory [7]
- 1/183 • • • • adjustable between in-use and out-of-use positions, e.g. to improve access [7]
- 1/184 • • • • Mechanisms for locking columns at selected positions [7]
- 1/185 • • • • adjustable by axial displacement, e.g. telescopically (B62D 1/183, B62D 1/187, B62D 1/19 take precedence) [7]
- 1/187 • • • • with tilt adjustment; with tilt and axial adjustment (B62D 1/183, B62D 1/19 take precedence) [7]
- 1/189 • • • • the entire steering column being tiltable as a unit [7]
- 1/19 • • • • incorporating energy-absorbing arrangements, e.g. by being yieldable or collapsible (shock-absorbers using plastic deformation of members in general F16F 7/12) [5]
- 1/20 • • • Connecting steering column to steering gear
- 1/22 • • Alternative steering-control elements, e.g. for teaching purposes
- 1/24 • not vehicle-mounted
- 1/26 • • mechanical, e.g. by a non-load-bearing guide (railways B61)

- 1/28 • • non-mechanical

#### **3/00 Steering gears (power assisted or power driven B62D 5/00; steering linkages B62D 7/00; for non-deflectable wheels B62D 11/00; gearing in general F16H)**

- 3/02 • mechanical
- 3/04 • • of worm type
- 3/06 • • • with screw and nut
- 3/08 • • • • using intermediate balls or the like
- 3/10 • • • with worm engaging in sector or roller gear
- 3/12 • • of rack-and-pinion type
- 3/14 • hydraulic

#### **5/00 Power-assisted or power-driven steering (for non-deflectable wheels B62D 11/00; fluid-pressure servomotors in general F15B)**

- 5/02 • mechanical, e.g. using a power-take-off mechanism for taking power from a rotating shaft of the vehicle and applying it to the steering gear
- 5/04 • electrical, e.g. using an electric servo-motor connected to, or forming part of, the steering gear
- 5/06 • fluid, i.e. using a pressurised fluid for most or all the force required for steering a vehicle [4]
- 5/065 • • characterised by specially adapted means for varying pressurised fluid supply based on need, e.g. on-demand, variable assist [7]
- 5/07 • • Supply of pressurised fluid for steering also supplying other consumers [4]
- 5/08 • • characterised by type of valve used (valves in general F16K) [4]
- 5/083 • • • Rotary valves [4]
- 5/087 • • • Sliding spool valves [4]
- 5/09 • • characterised by means for actuating valves [4]
- 5/093 • • • Telemotor driven by steering wheel movement (hydraulic steering gear B62D 3/14) [4]
- 5/097 • • • gerotor type [4]
- 5/10 • • characterised by type of power unit [4]
- 5/12 • • • Piston and cylinder [4]
- 5/14 • • • Rotary motor [4]
- 5/16 • • • Expansible chamber with flexible wall [4]
- 5/18 • • characterised by power transmitting means [4]
- 5/20 • • specially adapted for particular type of steering gear or particular application (steering gears *per se* B62D 3/00; steering linkages not characterised by being power-assisted or power-driven B62D 7/00) [4]
- 5/22 • • • for rack-and-pinion type [4]
- 5/24 • • • for worm type [4]
- 5/26 • • • for pivoted axles [4]
- 5/28 • • • for pivoted bogies [4]
- 5/30 • • Safety devices, e.g. alternate emergency power supply or transmission means to ensure steering upon failure of the primary steering means [4]

5/32 • • • for telemotor systems [4]

**6/00 Arrangements for automatically controlling steering depending on driving conditions sensed and responded to, e.g. control circuits** (means for initiating a change in direction B62D 1/00; steering valves B62D 5/06; combined with means for inclining the vehicle body or wheels on bends B62D 9/00) [4, 6]

**Note(s)**

1. When classifying in this group, classification is also made in the appropriate one of groups B62D 1/00 - B62D 5/00 or B62D 7/00 - B62D 19/00 if other aspects of the steering system are of interest.
2. In main group B62D 6/00, but excluding its subgroups, it is desirable to add the indexing codes of groups B62D 101/00 - B62D 137/00.

6/02 • responsive only to vehicle speed [4]

6/04 • responsive only to forces disturbing the intended course of the vehicle, e.g. forces acting transversely to the direction of vehicle travel [4]

6/06 • responsive only to vehicle vibration dampening arrangements (steering dampers for cycles B62K 21/08) [4]

6/08 • responsive only to input torque [6]

6/10 • • characterised by the means for sensing torque [6]

**7/00 Steering linkage; Stub axles or their mountings** (B62D 13/00 takes precedence; power-assisted or power-driven steering B62D 5/00) [5]

7/02 • for pivoted bogies

7/04 • • with more than one wheel

7/06 • for individually-pivoted wheels, e.g. on king-pins

7/08 • • the pivotal axes being situated in a single plane transverse to the longitudinal centre line of the vehicle

7/09 • • • characterised by means varying the ratio between the steering angles of the steered wheels (varying the ratio automatically depending on driving conditions B62D 6/00) [5]

7/10 • • • with single-output steering gear

7/12 • • • with twin-output steering gear

7/14 • • the pivotal axes being situated in more than one plane transverse to the longitudinal centre line of the vehicle, e.g. all-wheel steering

7/15 • • • characterised by means varying the ratio between the steering angles of the steered wheels (varying the ratio automatically depending on driving conditions B62D 6/00) [5]

7/16 • Arrangement of linkage connections (pivots per se F16C)

7/18 • Steering knuckles; King-pins

7/20 • Links, e.g. track rods (means for adjusting camber, castor, or toe-in B62D 17/00)

7/22 • Arrangements for reducing or eliminating reaction, e.g. vibration, from parts, e.g. wheels, of the steering system [5]

**9/00 Steering deflectable wheels not otherwise provided for** (steering-position indicators B62D 15/02)

9/02 • combined with means for inwardly-inclining vehicle body on bends

9/04 • combined with means for inclining vehicle wheels on bends (B62D 9/02 takes precedence) [5]

**11/00 Steering non-deflectable wheels; Steering endless tracks or the like**

11/02 • by differentially driving ground-engaging elements on opposite vehicle sides

11/04 • • by means of separate power sources

11/06 • • by means of a single main power source

11/08 • • • using brakes or clutches as main steering-effecting means

11/10 • • • using gearings with differential power outputs on opposite sides, e.g. twin- differential or epicyclic gears

11/12 • • • using separate change-speed gearings

11/14 • • • differential power outputs being effected by additional power supply to one side, e.g. power originating from secondary power source

11/16 • • • • the additional power supply being supplied mechanically

11/18 • • • • the additional power supply being supplied hydraulically

11/20 • Endless-track steering having pivoted bogie carrying track (B62D 11/02 takes precedence)

11/22 • Endless-track steering being effected by deflecting endless-track rollers or the like

11/24 • Endless-track steering specially adapted for vehicles having both steerable wheels and endless track

**12/00 Steering specially adapted for vehicles operating in tandem or having pivotally connected frames** (steering endless tracks or the like B62D 11/00; steering specially adapted for trailers B62D 13/00) [4]

12/02 • for vehicles operating in tandem [4]

**13/00 Steering specially adapted for trailers** (combined traction and steering hitches B60D)

13/02 • for centrally-pivoted axles

13/04 • for individually-pivoted wheels

13/06 • for backing a normally-drawn trailer

**15/00 Steering not otherwise provided for**

15/02 • Steering position indicators [4]

**17/00 Means on vehicle for adjusting camber, castor, or toe-in**

**19/00 Radius rods, i.e. distance members**

**Understructures; Superstructures; Vehicle bodies**

**21/00 Understructures, i.e. chassis frame on which a vehicle body may be mounted** (combined frame and vehicle body B62D 23/00)

21/02 • comprising longitudinally or transversely arranged frame members [4]

21/03 • • transverse members providing body support [4]

21/04 • • single longitudinal type

21/05 • • pinched frame type, i.e. formed of at least two longitudinal frame sections connected by other longitudinal frame sections of lesser transverse dimension [4]

21/06 • of X-shaped or fork-shaped construction, i.e. having members which form an X or fork as the frame is seen in plan view

## B62D

- 21/07 • wide-hipped frame type, i.e. a wide box-shaped mid portion with narrower sections extending from said mid portion in both fore and aft directions [4]
- 21/08 • built-up with interlaced cross members ("Fachwerkrahmen")
- 21/09 • Means for mounting load bearing surfaces [4]
- 21/10 • in which the main member is plate-like
- 21/11 • with resilient means for suspension [4]

### Note(s)

This group does not cover subject matter primarily relating to the suspension, with only a nominal recitation of frame structure, which is covered by subclass B60G.

- 21/12 • assembled from readily-detachable parts
- 21/14 • of adjustable length or width
- 21/15 • having impact absorbing means, e.g. a frame designed to permanently or temporarily change shape or dimension upon impact with another body (bumpers B60R 19/02; shock absorbers in general F16F) [4]
- 21/16 • having fluid storage compartment [4]
- 21/17 • forming fluid or electrical conduit means or having other means to accommodate the transmission of a force or signal [4]
- 21/18 • characterised by the vehicle type and not provided for in groups B62D 21/02-B62D 21/17 [4]
- 21/20 • • trailer type, i.e. a frame specifically constructed for use in a non-powered vehicle [4]

### 23/00 Combined superstructure and frame, i.e. monocoque constructions (superstructure sub-units B62D 25/00)

### 24/00 Connections between vehicle body and vehicle frame (B62D 23/00, B62D 33/077 take precedence) [5]

- 24/02 • Vehicle body, not intended to move relatively to the vehicle frame, and mounted on vibration absorbing mountings, e.g. rubber pads [5]
- 24/04 • Vehicle body mounted on resilient suspension for movement relative to the vehicle frame [5]

### 25/00 Superstructure sub-units; Parts or details thereof not otherwise provided for

- 25/02 • Side panels
- 25/04 • Door pillars
- 25/06 • Fixed roofs (non-fixed roofs or roofs with movable panels B60J 7/00; roof liners B60R 13/02; insulating elements B60R 13/08)
- 25/07 • • having water drainage or guide means integral with roof structure [4]
- 25/08 • Front or rear portions
- 25/10 • • Bonnets or lids
- 25/12 • • • Parts or details thereof (locks E05B; hinges E05D; counterbalancing means E05F; springs F16F)
- 25/13 • • • • Water deflectors [5]
- 25/14 • • Dashboards as superstructure sub-unit (other dashboard aspects B60K)
- 25/16 • • Mud-guards or wings; Wheel cover panels (equipped with means for freeing wheels or tyres from foreign matter B60S)
- 25/18 • • • Parts or details thereof, e.g. mud-guard flaps
- 25/20 • Floors or bottom sub-units
- 25/22 • Running-boards, steps, or the like, as superstructure sub-unit (other arrangements of steps, ladders, or running-boards in vehicles B60R)

- 25/24 • Superstructure sub-units with access openings having movable or removable closures (inlet covers for vehicle fuel tanks B60K 15/05) [5]

### 27/00 Connections between superstructure sub-units

- 27/02 • rigid
- 27/04 • resilient
- 27/06 • readily releasable

### 29/00 Superstructures characterised by material thereof

- 29/02 • predominantly of wood
- 29/04 • predominantly of synthetic material (working of plastics or substances in a plastic state B29)

### 31/00 Superstructures for passenger vehicles (passenger vehicles specially adapted to co-operate with aircraft or terminal buildings B64F 1/31)

- 31/02 • for carrying large numbers of passengers, e.g. omnibus
- 31/04 • with more than one deck

### 33/00 Superstructures for load-carrying vehicles (in which a load-carrying element is movable B60P; liners B60R 13/00)

- 33/02 • Platforms; Open load compartments
- 33/023 • • Sideboard or tailgate structures [5]
- 33/027 • • • movable [5]
- 33/03 • • • • by swinging down [5]
- 33/033 • • • • removable [5]
- 33/037 • • • • Latching means therefor [5]
- 33/04 • Enclosed load compartments
- 33/06 • Drivers' cabs
- 33/063 • • movable from one position into at least one other position, e.g. tiltable, pivotable about a vertical axis, displaceable from one side of the vehicle to the other [5]
- 33/067 • • • tiltable [5]
- 33/07 • • • • characterised by the device for locking the cab in the tilted or in the driving position [5]
- 33/073 • • • characterised by special adaptations of vehicle control devices [5]
- 33/077 • characterised by the connection of the superstructure to the vehicle frame [5]
- 33/08 • • comprising adjustable means (B62D 33/10 takes precedence) [5]
- 33/10 • • comprising means for the suspension of the superstructure on the frame [5]

### 35/00 Vehicle bodies characterised by streamlining

- 35/02 • Streamlining the undersurfaces

### 37/00 Stabilising vehicle bodies without controlling suspension arrangements

- 37/02 • by aerodynamic means
- 37/04 • by means of movable masses
- 37/06 • • using gyroscopes

### 39/00 Vehicle bodies not otherwise provided for

### 41/00 Fittings for identifying vehicles in case of collision; Fittings for marking or recording collision areas

### 43/00 Spare wheel stowing, holding, or mounting arrangements

- 43/02 • external to the vehicle body
- 43/04 • • attached beneath the vehicle body

- 43/06 • within the vehicle body
- 43/08 • • and arranged substantially vertical
- 43/10 • • and arranged substantially horizontal

**Motor vehicles or trailers classified according to type; Parts or accessories thereof not otherwise provided for**

**47/00 Motor vehicles or trailers predominantly for carrying passengers** (superstructures B62D 31/00) [3]

- 47/02 • for large numbers of passengers, e.g. omnibus

**49/00 Tractors** (of walk type B62D 51/04; endless-track features B62D 55/00)

- 49/02 • modified to take lifting devices
- 49/04 • modified to take pushing devices
- 49/06 • adapted for multi-purpose use
- 49/08 • having means for preventing overturning or tipping (safety devices for propulsion-unit control, specially adapted for, or arranged in, vehicles B60K 28/00) [4]

**51/00 Motor vehicles characterised by the driver not being seated**

- 51/02 • the driver standing in the vehicle
- 51/04 • the driver walking
- 51/06 • • Uniaxle walk-type tractors

**53/00 Tractor-trailer combinations; Road trains** (traction couplings other than fifth-wheel couplings B60D)

- 53/02 • comprising a uniaxle tractor unit and a uniaxle trailer unit
- 53/04 • comprising a vehicle carrying an essential part of the other vehicle's load by having supporting means for the front or rear part of the other vehicle
- 53/06 • • Semi-trailers
- 53/08 • • Fifth-wheel traction couplings
- 53/10 • • • with means for preventing accidental uncoupling
- 53/12 • • • engaging automatically

**55/00 Endless-track vehicles** (steering aspects B62D 11/00)

- 55/02 • with tracks and additional ground wheels
- 55/04 • with tracks and alternative ground wheels, e.g. changeable from endless-track vehicle into wheeled vehicle and *vice versa*
- 55/06 • with tracks and without ground wheels
- 55/065 • • Multi-track vehicles, i.e. more than two tracks [4]
- 55/07 • • Mono-track vehicles [4]
- 55/075 • • Tracked vehicles for ascending or descending stairs (magnetic or pneumatic ground-engaging parts B62D 55/265; chairs or personal conveyances specially adapted for patients or disabled persons A61G 5/00) [4]
- 55/08 • Endless-track units; Parts thereof
- 55/084 • • Endless-track units or carriages mounted separably, adjustably or extensibly on vehicles, e.g. portable track units (B62D 55/07 takes precedence) [4]
- 55/088 • • with means to exclude or remove foreign matter e.g. sealing means, self-cleaning track links or sprockets, deflector plates or scrapers [4]
- 55/092 • • with lubrication means (lubricating in general F16N) [4]
- 55/096 • • with noise reducing means [4]
- 55/10 • • Bogies; Frames (track-tensioning means B62D 55/30)
- 55/104 • • Suspension devices for wheels, rollers, bogies or frames (vehicle suspension in general B60G) [4]

- 55/108 • • • with mechanical springs, e.g. torsion bars [4]
- 55/112 • • • with fluid springs, e.g. hydraulic, pneumatic [4]
- 55/116 • • • Attitude or position control of chassis by action on suspension, e.g. to compensate for a slope [4]

- 55/12 • • Arrangement, location, or adaptation of driving sprockets

- 55/125 • • • Final drives [4]

- 55/13 • • • • readily interchangeable modular type [4]

- 55/135 • • • with dismountable driving crown [4]

- 55/14 • • Arrangement, location, or adaptation of rollers

- 55/15 • • • Mounting devices, e.g. bushings, axles, bearings, sealings [4]

- 55/18 • • Tracks (self-cleaning track links B62D 55/088) [4]

- 55/20 • • • of articulated type, e.g. chains

- 55/205 • • • • Connections between track links [4]

- 55/21 • • • • • Links connected by transverse pivot pins [4]

- 55/215 • • • • • Resilient connections between links [4]

- 55/22 • • • • Arrangements for preventing or modifying back-flexing

- 55/24 • • • • of continuously-flexible type, e.g. rubber belts

- 55/247 • • • • Gas filled or inflatable flexible tracks (connection of valves to inflatable elastic bodies B60C 29/00) [4]

- 55/253 • • • • • having elements interconnected by one or more cables or like elements [4]

- 55/26 • • • Ground-engaging parts or elements

- 55/265 • • • • having magnetic or pneumatic adhesion [4]

- 55/27 • • • • having different types of crampons for progression over varying ground [4]

- 55/275 • • • • with street plate, i.e. means to prevent tread from cutting into road surface [4]

- 55/28 • • • • detachable

- 55/30 • • Track-tensioning means

- 55/32 • Assembly, disassembly, repair or servicing of endless-track systems [4]

**57/00 Vehicles characterised by having other propulsion or other ground-engaging means than wheels or endless track, alone or in addition to wheels or endless track** (sledges B62B; motor sledges B62M) [5]

- 57/02 • with ground-engaging propulsion means, e.g. walking members

- 57/024 • • specially adapted for moving on inclined or vertical surfaces (endless-track vehicles for ascending or descending stairs B62D 55/075; hand-carts with provision for travelling up or down stairs B62B 5/02) [5]

- 57/028 • • having wheels and mechanical legs (B62D 57/024 takes precedence; ground-engaging vehicle fittings for supporting, lifting or manoeuvring the vehicle, wholly or in part B60S 9/00) [5]

- 57/032 • • with alternately or sequentially lifted supporting base and leg; with alternately or sequentially lifted feet or skid (B62D 57/024 takes precedence) [5]

- 57/036 • • screw type, e.g. Archimedian screw (B62D 57/024 takes precedence) [5]

- 57/04 • having other than ground-engaging propulsion means, e.g. having propellers (arrangement of jet-propulsion units B60K)

**59/00 Trailers with driven ground wheels or the like**

- 59/02 • driven from external propulsion unit
- 59/04 • driven from propulsion unit on trailer

## B62D

<b>61/00</b>	<b>Motor vehicles or trailers, characterised by the arrangement or number of wheels, not otherwise provided for, e.g. four wheels in diamond pattern</b>	<b>67/00</b>	<b>Systematic disassembly of vehicles for recovery of salvageable components, e.g. for recycling (for disposal of vehicles by destroying or transformation B09B 3/00, B09B 5/00) [7]</b>
61/02	• with two road wheels in tandem on the longitudinal centre line of the vehicle	<b><u>Indexing scheme associated with group B62D 6/00, but excluding groups B62D 6/02-B62D 6/10, relating to driving conditions sensed and responded to. [5]</u></b>	
61/04	• • with two other wheels which are coaxial	<b>101/00</b>	<b>Road speed [5]</b>
61/06	• with only three wheels	<b>103/00</b>	<b>Acceleration or deceleration in the direction of travel [5]</b>
61/08	• • with single front wheel	<b>105/00</b>	<b>Loss of traction, e.g. wheel spin or skid [5]</b>
61/10	• with more than four wheels	<b>107/00</b>	<b>Temperature [5]</b>
61/12	• with variable number of ground-engaging wheels, e.g. with some wheels arranged higher than others, or with retractable wheels (for manoeuvring purposes only B60S)	<b>109/00</b>	<b>Presence, absence or inactivity of driver or operator, e.g. by sensing the operation of the clutch, brake or throttle [5]</b>
<b>63/00</b>	<b>Motor vehicles or trailers not otherwise provided for</b>	<b>111/00</b>	<b>Forces disturbing the intended course of the vehicle, e.g. forces acting transversely of the direction of travel [5]</b>
63/02	• Motor vehicles	<b>113/00</b>	<b>Position of parts of the steering mechanism, e.g. the steered wheels or the steering wheel [5]</b>
63/04	• • Component parts or accessories	<b>115/00</b>	<b>Angle of articulation of articulated vehicle; Angle of tow-bar to towing vehicle [5]</b>
63/06	• Trailers (vehicles comprising living accommodation for people, e.g. caravans, camping or like vehicles, B60P 3/32)	<b>117/00</b>	<b>Angular velocity of steering wheel [5]</b>
63/08	• • Component parts or accessories	<b>119/00</b>	<b>Steering wheel torque [5]</b>
<b>65/00</b>	<b>Designing, manufacturing, e.g. assembling, facilitating disassembly, or structurally modifying motor vehicles or trailers, not otherwise provided for</b>	<b>121/00</b>	<b>Force applied to the steering linkage [5]</b>
65/02	• Joining sub-units or components to, or positioning sub-units or components with respect to, body shell or other sub-units or components [7]	<b>123/00</b>	<b>Fluid pressure supply for vehicle equipment, e.g. for power-assisted steering; Presence, failure or threshold values thereof; Lubricating or other fluid capacities [5]</b>
65/04	• • Joining preassembled modular units composed of sub-units performing diverse functions, e.g. engine and bonnet (B62D 65/06-B62D 65/16 take precedence) [7]	<b>125/00</b>	<b>Particular gear ratio selected [5]</b>
65/06	• • the sub-units or components being doors, windows, openable roofs, lids, bonnets, or weather strips or seals therefor [7]	<b>127/00</b>	<b>Engine speed [5]</b>
65/08	• • • Weather strips or seals [7]	<b>131/00</b>	<b>Load, including height of vehicle dependent on load; State of vehicle vibration damping means [5]</b>
65/10	• • the sub-units or components being engines, clutches or transmissions [7]	<b>133/00</b>	<b>Trim or inclination, including road gradient [5]</b>
65/12	• • the sub-units or components being suspensions, brakes or wheel units [7]	<b>135/00</b>	<b>Air moisture content [5]</b>
65/14	• • the sub-units or components being passenger compartment fittings, e.g. seats, linings, trim, instrument panels [7]	<b>137/00</b>	<b>Conditions not specified in groups B62D 101/00-B62D 135/00 [5]</b>
65/16	• • the sub-units or components being exterior fittings, e.g. bumpers, lights, wipers [7]		
65/18	• Transportation, conveyor or haulage systems specially adapted for motor vehicle or trailer assembly lines [7]		
<b>B62H</b>	<b>CYCLE STANDS; SUPPORTS OR HOLDERS FOR PARKING OR STORING CYCLES; APPLIANCES PREVENTING OR INDICATING UNAUTHORISED USE OR THEFT OF CYCLES; LOCKS INTEGRAL WITH CYCLES; DEVICES FOR LEARNING TO RIDE CYCLES</b>		

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "cycles" includes scooters.

<b>1/00</b>	<b>Supports or stands forming part of, or attached to, cycles</b>	1/02	• Articulated stands, e.g. in the shape of hinged arms (B62H 1/10 takes precedence)
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- 1/04 • • Substantially U-shaped stands for embracing the rear wheel
- 1/06 • Extensible stands, e.g. with telescopic parts (B62H 1/10 takes precedence)
- 1/08 • Pedal supports
- 1/10 • involving means providing for a stabilised ride (training appliances or apparatus for cycling sport A63B 69/16)
- 1/12 • • using additional wheels
- 1/14 • • using runners for riding on ice or snow (runners for carrying wheeled vehicles to facilitate travel on ice or snow B62B 19/00)
- 3/00 Separate supports or holders for parking or storing cycles** (cycle supports used during maintenance B25H; building aspects E04H)
- 3/02 • involving means for gripping the cycle by the handle-bars or by the upper part of the frame
- 3/04 • involving forked supports or brackets for holding a wheel (B62H 3/08 takes precedence)
- 3/06 • • collapsible
- 3/08 • involving recesses or channelled rails for embracing the bottom part of a wheel
- 3/10 • involving forked supports or brackets embracing the bottom part of the frame

**B62J CYCLE SADDLES OR SEATS; ACCESSORIES PECULIAR TO CYCLES AND NOT OTHERWISE PROVIDED FOR, e.g. ARTICLE CARRIERS OR CYCLE PROTECTORS** (registration plates B60R 13/10; cyclometers, i.e. wheel-revolution counters, G01C 22/00)

#### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "cycles" includes scooters.

#### Subclass index

SADDLES, SEATS; FOOT-RESTS, KNEE GRIPS.....	1/00, 25/00
LIGHTING OR SIGNALLING DEVICES; MIRROR ARRANGEMENTS.....	3/00, 6/00, 29/00
ARTICLE CARRIERS, ACCESSORIES.....	7/00, 9/00, 11/00
PROTECTING ARRANGEMENTS OR ACCESSORIES	
Chain-guards; mud-guards; parking covers.....	13/00, 15/00, 19/00
For rider only; weather guards, fairing; dress protectors; warming.....	17/00, 21/00, 33/00
Other protectors.....	23/00
SAFETY EQUIPMENT.....	27/00
INSTALLATIONS OF LUBRICATING DEVICES; OF FUEL TANKS; OF SUPPLY LINES.....	31/00, 35/00, 37/00
OTHER ACCESSORIES.....	99/00

- 1/00 Saddles or other seats for cycles; Arrangement thereof; Component parts** (arrangements or adaptations of vehicle seats in general B60N)
- 1/02 • Saddles resiliently mounted on the frame; Equipment therefor, e.g. springs (springs in general F16F)
- 1/04 • • Saddles capable of swinging about a horizontal pivot
- 1/06 • • Saddles capable of parallel motion up and down
- 1/08 • Frames for saddles; Connections between saddle frames and seat pillars; Seat pillars (attaching seat pillars to cycle frames B62K 19/36)
- 1/10 • Internal adjustment of saddles
- 1/12 • Box-shaped seats; Bench-type seats, e.g. dual or twin seats
- 1/14 • Separate pillions
- 1/16 • • for children

- 3/12 • Hanging-up devices

- 5/00 Appliances preventing or indicating unauthorised use or theft of cycles; Locks integral with cycles** (fittings for preventing or indicating use or theft of vehicles in general B60R; general features of locks E05B)
- 5/02 • for locking the steering mechanism
- 5/04 • • acting on the handle-bars or equivalent
- 5/06 • • acting on the front wheel fork or steering head tube
- 5/08 • preventing the drive (by acting on powered drive B62M)
- 5/10 • • acting on a pedal crank
- 5/12 • • acting on the chain wheel or the chain
- 5/14 • preventing wheel rotation
- 5/16 • • acting on parts of a road wheel
- 5/18 • • acting on a braking device (locking cycle brake actuating mechanisms B62L 3/06)
- 5/20 • indicating unauthorised use, e.g. acting on signalling devices
- 7/00 Devices for learning to ride cycles, not otherwise provided for, e.g. assisting balance**

- 1/18 • Covers for saddles or other seats; Paddings (paddings in general B68G)
- 1/20 • • Detachable covers; Detachable pads
- 1/22 • • Covers with built-in paddings
- 1/24 • • Paddings involving torsional or bending springs
- 1/26 • • Paddings involving other resilient material, e.g. sponge rubber with inflatable compartments
- 1/28 • Other additional equipment, e.g. back rests for children

#### Signal or lighting devices specially adapted for cycles

- 3/00 Acoustic signal or alarm devices** (acoustic signal or alarm devices in general G08); **Arrangement of such devices on cycles**

- 6/00 Arrangement of optical signalling or lighting devices on cycles, the mounting or supporting thereof or circuits therefor** (optical signalling or lighting devices *per se* F21, G08, H05) [4]
- 6/02 • the devices being headlights [4]
- 6/04 • the devices being rear lights [4]
- 6/06 • Arrangement of lighting dynamos or drives therefor (dynamo construction H02K) [4]
- 6/08 • • Tyre drives [4]
- 6/10 • • Gear drives (B62J 6/12 takes precedence) [4]
- 6/12 • • Dynamos arranged in the wheel hub [4]
- 6/14 • • Belt drives [4]
- 6/16 • Arrangement of switches [4]
- 6/18 • Arrangement of electric cables [4]
- 6/20 • Arrangement of reflectors (pedals incorporating reflectors B62M 3/12) [4]

#### Article carriers

- 7/00 Luggage carriers**
- 7/02 • characterised by the arrangement thereof on cycles
- 7/04 • • above or behind the rear wheel
- 7/06 • • above the front wheel, e.g. on the handle-bars
- 7/08 • Equipment for securing luggage on carriers
- 9/00 Panniers, saddle bags, or other containers specially adapted to be attached to cycles**
- 9/02 • for tools or spare parts
- 11/00 Supporting devices for attaching articles of definite shape to cycles, e.g. for maps, umbrellas, bottles**
- 11/02 • for pumps

#### Protectors; Fairings or streamlining parts not otherwise provided for

- 13/00 Guards for chain, chain drive, or equivalent drive, e.g. belt drive** (chain guards forming part of cycle frames B62K 19/44)
- 13/02 • shielding only the upper run of the chain or the like
- 13/04 • completely enclosing the chain drive or the like
- 13/06 • • admitting ready access to the chain or the like
- 15/00 Mud-guards for wheels**

#### B62K CYCLES; CYCLE FRAMES; CYCLE STEERING DEVICES; RIDER-OPERATED TERMINAL CONTROLS SPECIALLY ADAPTED FOR CYCLES; CYCLE AXLE SUSPENSIONS; CYCLE SIDECARS, FORECARS, OR THE LIKE

#### Subclass index

##### KINDS OF CYCLES

Characterised by construction:

number of wheels: unicycle; bicycle; with more than two wheels.....1/00, 3/00, 5/00

with motor.....11/00

sidecar, forecar.....27/00

convertible; foldable.....13/00, 15/00

Characterised by purpose: for transport; for children.....7/00, 9/00

Other kinds.....17/00

##### PARTS OF CYCLES

Frame; axle suspension.....19/00, 25/00

Steering; terminal controls.....21/00, 23/00

15/02 • Fastening means; Stays

15/04 • Mud flaps

**17/00 Weather guards for riders; Fairings or streamlining parts not otherwise provided for** (protective clothing or garments A41D 13/00; crash helmets A42B 3/00; fairings forming part of frames B62K 19/48; fairings for sidecars B62K 27/04; hoods for sidecars B62K 27/16)

17/02 • shielding only the rider's front

17/04 • • Windscreens

17/06 • • Leg guards

17/08 • Hoods protecting the rider

**19/00 Parking covers for cycles** (convertible into protective garments for the rider A41D 15/04; convertible into camping articles A45F 4/00; for vehicles in general B60J 11/00)

**21/00 Dress protectors, e.g. clips attached to the cycle** (loose clips for trousers or skirts A41F 17/02)

**23/00 Other protectors specially adapted for cycles**

**25/00 Foot-rests; Rigidly-mounted knee grips, e.g. on petrol tank**

**27/00 Safety equipment, e.g. crash bars** (safety belts in general A62B 35/00)

**29/00 Adaptations or arrangements of mirrors for use on cycles** (for vehicles in general B60R)

**31/00 Installations of lubricating devices**

**33/00 Installations peculiar to cycles for warming riders** (for vehicles in general B60H)

**35/00 Fuel tanks specially adapted for motorcycles or engine-assisted cycles; Arrangements thereof** (fuel tanks forming part of cycle frames B62K 11/00; tanks in general B65D)

**37/00 Arrangements of fuel supply lines, taps, or the like, on motorcycles or engine-assisted cycles**

**99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

**Note(s)**

Groups B62K 7/00-B62K 15/00 take precedence overgroups B62K 1/00-B62K 5/00, e.g. a child's bicycle is classified in group B62K 9/00 and not in group B62K 3/00.

<b>1/00</b>	<b>Unicycles</b>
<b>3/00</b>	<b>Bicycles</b>
3/02	• Frames (tandem frames B62K 3/14)
3/04	• • having a substantially-horizontal top bar
3/06	• • of open type
3/08	• • • having crossing members
3/10	• • of single-beam type, i.e. connecting steering head to rear axle
3/12	• Tandems
3/14	• • Frames
3/16	• specially adapted for disabled riders
<b>5/00</b>	<b>Cycles with more than two main road wheels</b> (specially adapted for disabled persons A61G 5/00; cycle supports or stands equipped with additional wheels for ride stabilisation B62H 1/12)
5/02	• Tricycles
5/04	• • with two coaxial wheels
5/06	• • • Frames
5/08	• Steering devices acting on more than one wheel
<b>7/00</b>	<b>Freight- or passenger-carrying cycles</b>
7/02	• Frames
7/04	• • having a carrying platform (article-carrying accessories B62J 7/00-B62J 11/00)
<b>9/00</b>	<b>Children's cycles</b> (toy vehicles A63H 17/00)
9/02	• Tricycles
<b>11/00</b>	<b>Motorcycles; Engine-assisted cycles; Motor-scooters</b> (fairings or streamlining parts, not forming part of frame B62J; transmission of drive from engine to wheels B62M)
11/02	• Frames (motorcycles or cycles with auxiliary engines characterised by position of engine B62M)
11/04	• • characterised by the engine being between front and rear wheels
11/06	• • • the frame being of single-beam type
11/08	• • • • the beam being fabricated from sheet metal, e.g. forming fuel tank walls
11/10	• • characterised by the engine being over or beside driven rear wheel
11/12	• Steering wheel forks characterised by the association therewith of engine
11/14	• Handle-bar constructions, or arrangements of controls thereon, specially adapted thereto (hand controls <u>per se</u> B62K 23/02)
<b>13/00</b>	<b>Cycles convertible to, or transformable into, other types of cycles or land vehicles</b> (convertible vehicles in general B60F 5/00; cycle supports or stands equipped with additional wheels for ride stabilisation B62H 1/12)
13/02	• to a tandem
13/04	• to a tricycle
13/06	• to a quadricycle, e.g. by coupling together two bicycles side by side
13/08	• Frames
<b>15/00</b>	<b>Collapsible or foldable cycles</b>
<b>17/00</b>	<b>Cycles not otherwise provided for</b>

<b>19/00</b>	<b>Cycle frames</b> (cycle frames specially adapted for one particular kind of cycle specified in groups B62K 1/00-B62K 17/00, <u>see</u> the relevant group)
19/02	• characterised by material or cross-section of frame members
19/04	• • the material being wholly or mainly metallic, e.g. of high elasticity
19/06	• • • tubular
19/08	• • • made from sheet
19/10	• • • Combinations of tube and sheet
19/12	• • • having cast members
19/14	• • the material being wholly or mainly wood
19/16	• • the material being wholly or mainly of plastics
19/18	• Joints between frame members
19/20	• • welded, soldered, or brazed
19/22	• • Adhesive joints
19/24	• • Screwed joints
19/26	• • Riveted joints
19/28	• • Means for strengthening joints
19/30	• Frame parts shaped to receive other cycle parts or accessories (axle suspensions B62K 25/00)
19/32	• • Steering heads (bearings therefor B62K 21/06)
19/34	• • Bottom brackets
19/36	• • for attaching saddle pillars, e.g. adjustable during ride
19/38	• • for attaching brake members
19/40	• • for attaching accessories, e.g. article carriers, lamps
19/42	• • • for tyre pumps (attachment devices not forming part of frame B62J 11/02)
19/44	• Chain-guards forming part of frame (chain-guards <u>per se</u> B62J 13/00)
19/46	• Luggage carriers forming part of frame (luggage carriers <u>per se</u> B62J 7/00)
19/48	• Fairings forming part of frame
<b>21/00</b>	<b>Steering devices</b> (steering devices specially adapted for one particular kind of cycle specified in groups B62K 1/00-B62K 17/00, <u>see</u> the relevant group)
21/02	• Front wheel forks or equivalent, e.g. single tine
21/04	• Fork crowns
21/06	• Bearings specially adapted for steering heads (bearings in general F16C)
21/08	• Steering dampers (dampers in general F16F)
21/10	• Mechanisms for restoring steering device to straight-ahead position
21/12	• Handle-bars; Handle-bar stems
21/14	• • having resilient parts therein
21/16	• • having adjustable parts therein
21/18	• Connections between forks and handle-bars or handle-bar stems
21/20	• • resilient
21/22	• • adjustable
21/24	• • readily releasable
21/26	• Handle-bar grips (twist grips B62K 23/04)
<b>23/00</b>	<b>Rider-operated controls specially adapted for cycles, i.e. means for initiating control operations, e.g. levers, grips</b> (specially adapted to cycle brake mechanisms B62L 3/00)
23/02	• hand-actuated (arrangements of controls on handle-bars of engine-driven cycles B62K 11/14)
23/04	• • Twist grips
23/06	• • Levers
23/08	• foot-actuated

## B62K

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| <p><b>25/00 Axle suspensions</b> (for vehicles in general B60G)</p> <p>25/02 • for mounting axles rigidly on cycle frame or fork, e.g. adjustably</p> <p>25/04 • for mounting axles resiliently on cycle frame or fork (for sidecars, forecars, or the like B62K 27/06)</p> <p>25/06 • • with telescopic fork, e.g. including auxiliary rocking arms</p> <p>25/08 • • • for front wheel</p> <p>25/10 • • • for rear wheel</p> <p>25/12 • • with rocking arm pivoted on each fork leg (in combination with telescopic fork B62K 25/06)</p> <p>25/14 • • • with single arm on each fork leg</p> <p>25/16 • • • • for front wheel</p> <p>25/18 • • • • • the arm being pivoted intermediate its ends</p> <p>25/20 • • • • for rear wheel</p> <p>25/22 • • • with more than one arm on each fork leg</p> | <p>25/24 • • • • for front wheel</p> <p>25/26 • • • • for rear wheel</p> <p>25/28 • • with pivoted chain-stay</p> <p>25/30 • • • pivoted on pedal crank shelf (B62K 25/32 takes precedence)</p> <p>25/32 • • • the chain-stay forming a chain-guard</p> <p><b>27/00 Sidecars; Forecars or the like</b> (trailers B60P, B62D; characterised by carrying propulsion engine B62M)</p> <p>27/02 • Frames</p> <p>27/04 • Car bodies; Fairings</p> <p>27/06 • Resilient axle suspension</p> <p>27/08 • Resilient car-body suspension on frame</p> <p>27/10 • Other component parts or accessories</p> <p>27/12 • • Coupling parts for attaching cars or the like to cycle; Arrangements thereof</p> <p>27/14 • • • Resilient coupling parts</p> <p>27/16 • • Hoods; Weather-guards, e.g. windscreens</p> |
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## B62L BRAKES SPECIALLY ADAPTED FOR CYCLES

### Note(s)

1. This subclass covers only adaptations of brakes or actuating mechanisms peculiar to their use on cycles.
2. This subclass does not cover brakes or actuating mechanisms of wider applicability, which are regarded as of general type, irrespective of whether described or claimed only for cycles, which are covered by subclass B60T or the relevant subclasses of class F16.

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| <p><b>1/00 Brakes; Arrangements thereof</b> (back-peddalling brakes B62L 5/00)</p> <p>1/02 • in which cycle wheels are engaged by brake elements</p> <p>1/04 • • the tyre surfaces being engaged</p> <p>1/06 • • the wheel-rim being engaged</p> <p>1/08 • • • by the elements moving radially relative to the wheel</p> <p>1/10 • • • by the elements moving substantially parallel to the wheel axis</p> <p>1/12 • • • • the elements being mounted on levers pivotable about a common axis</p> <p>1/14 • • • • the elements being mounted on levers pivotable about different axes</p> <p>1/16 • • • • • the axes being located intermediate the ends of the levers</p> <p><b>3/00 Brake-actuating mechanisms</b> (actuating mechanisms for back-peddalling brakes B62L 5/00; Bowden mechanisms F16C 1/10); <b>Arrangements thereof</b></p> <p>3/02 • for control by a hand lever (hand levers for control of cycles in general B62K 23/06)</p> <p>3/04 • for control by a foot lever (foot levers for control of cycles in general B62K 23/08)</p> | <p>3/06 • Means for locking the actuating mechanisms (locking a cycle braking device directly B62H 5/18)</p> <p>3/08 • Mechanisms specially adapted for braking more than one wheel</p> <p><b>5/00 Brakes, or actuating mechanisms therefor, controlled by back-peddalling</b> (free-wheel devices specially adapted for cycles F16D 41/00)</p> <p>5/02 • the brakes being actuated through coacting coaxial cones</p> <p>5/04 • • the brakes being of expanding-brake-bushing type</p> <p>5/06 • • the brakes being of disc type</p> <p>5/08 • • the brakes being of shoe type</p> <p>5/10 • the brakes being actuated through coacting cams and balls or rollers</p> <p>5/12 • • the brakes being of expanding-brake-bushing type</p> <p>5/14 • • the brakes being of disc type</p> <p>5/16 • • the brakes being of shoe type</p> <p>5/18 • the brakes being additionally controlled by alternative means</p> <p>5/20 • the brakes having adjustable braking power</p> |
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## B62M RIDER PROPULSION OF WHEELED VEHICLES OR SLEDGES; POWERED PROPULSION OF SLEDGES OR CYCLES; TRANSMISSIONS SPECIALLY ADAPTED FOR SUCH VEHICLES (arrangements or mounting of transmissions in vehicles in general B60K; transmission elements per se F16)

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "transmission" means all parts between the prime mover or the part to which a rider immediately applies propulsive effort, e.g. pedal cranks, and a driven ground wheel.

**Subclass index****PROPULSION**

- Of wheeled vehicles by hand, foot or with additional source of power: kinds of mechanisms;  
 construction of propulsion cranks or levers.....1/00, 3/00, 5/00, 6/00  
 Of single-track vehicles by motor, characterised by position of engine.....7/00  
 Of sledges or the like.....27/00  
 Of wheeled vehicles or sledges, by ground-engaging means not otherwise provided for.....29/00

**TRANSMISSIONS**

- Characterised by rigid mechanical parts thereof  
 chain or belt; toothed or friction wheel; friction roller.....9/00, 11/00, 13/00  
 crankshaft or coupling- rods; rotary shaft.....15/00, 17/00  
 Characterised by non-mechanical or non-rigid parts thereof.....19/00, 21/00, 23/00  
 Gearing speed-change actuators.....25/00

**Rider propulsion of wheeled vehicles**

- 1/00 Rider propulsion of wheeled vehicles** (rider propulsion with additional source of power B62M 6/00; propulsion by ground-engaging rods B62M 29/02) **[1, 2010.01]**
- 1/02 • with rotary cranks, e.g. with pedal cranks (cranks per se B62M 3/00; immobilisable as foot-rests B62M 5/00)
- 1/04 • with reciprocating levers, e.g. foot levers (immobilisable as foot-rests B62M 5/00)
- 1/06 • driving a rotary crankshaft connected to driven axle other than by coupling-rods
- 1/08 • • directly driving a ratchet wheel on driven axle
- 1/10 • involving devices which enable the mechanical storing and releasing of energy occasionally, e.g. arrangement of flywheels **[1, 2010.01]**
- 1/12 • operated both by hand and by foot
- 1/14 • exclusively by hand power (hand cranks per se B62M 3/00)
- 1/16 • • by means of a to-and-fro movable handle-bar
- 1/18 • by movement of rider's saddle
- 1/20 • • with additional rider propulsion means
- 3/00 Construction of cranks operated by hand or foot**
- 3/02 • of adjustable length
- 3/04 • • automatically adjusting
- 3/06 • with elliptical or other non-circular rotary movement
- 3/08 • Pedals
- 3/10 • • All-metal pedals
- 3/12 • • with reflectors
- 3/14 • Hand-grips for hand-operated cranks
- 3/16 • Accessories
- 5/00 Foot-driven levers as pedal cranks which can be immobilised as foot-rests** (immobilising against theft B62H 5/10)
- 6/00 Rider propulsion of wheeled vehicles with additional source of power, e.g. combustion engine or electric motor [2010.01]**

**Note(s) [2010.01]**

In this main group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place

- 6/20 • • power-driven at crank shaft parts **[2010.01]**
- 6/25 • • power-driven at axle parts **[2010.01]**
- 6/30 • • power-driven at single endless flexible member, e.g. chain, between cycle crankshaft and wheel axle, the engine engaging the endless flexible member **[2010.01]**
- 6/35 • • power-driven by friction rollers or gears engaging the ground wheel **[2010.01]**
- 6/40 • Rider propelled cycles with auxiliary electric motor **[2010.01]**
- 6/45 • • Control or actuating devices therefor **[2010.01]**
- 6/50 • • characterised by detectors or sensors, or arrangement thereof **[2010.01]**
- 6/55 • • power-driven at crank shafts parts **[2010.01]**
- 6/60 • • power-driven at axle parts **[2010.01]**
- 6/65 • • • with axle and driving shaft arranged coaxially **[2010.01]**
- 6/70 • • power-driven at single endless flexible member, e.g. chain, between cycle crankshaft and wheel axle, the motor engaging the endless flexible member **[2010.01]**
- 6/75 • • power-driven by friction rollers or gears engaging the ground wheel **[2010.01]**
- 6/80 • Accessories, e.g. power sources; Arrangements thereof **[2010.01]**
- 6/85 • • Solar cells **[2010.01]**
- 6/90 • • Batteries **[2010.01]**
- 7/00 Motorcycles characterised by position of motor or engine** (rider propulsion with addition source of power, e.g. auxiliary combustion engine or electric motor B62M 6/00; frames characterised by position of engine B62K 11/00) **[1, 2010.01]**
- 7/02 • with engine between front and rear wheels
- 7/04 • • below the frame
- 7/06 • • directly under the saddle or seat
- 7/08 • with the engine over the rear wheel
- 7/10 • with the engine over the front wheel
- 7/12 • with the engine beside or within the driven wheel
- 7/14 • with the engine on an auxiliary wheeled unit, e.g. trailer, sidecar (trailers B60P, B62D; sidecars B62K 27/00)

**Transmissions**

- 6/10 • Rider propelled cycles with auxiliary combustion engine **[2010.01]**
- 6/15 • • Control or actuating devices therefor **[2010.01]**

- 9/00 Transmissions characterised by use of an endless chain, belt, or the like** (cycle chain guards B62J 13/00)

**Note(s) [2010.01]**

In this main group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

- 9/02 • of unchangeable ratio
- 9/04 • of changeable ratio
- 9/06 • • using a single chain, belt, or the like
- 9/08 • • • involving eccentrically-mounted or elliptically-shaped driving or driven wheel; with expansible driving or driven wheel
- 9/10 • • • involving different-sized wheels selectively engaged by the chain, belt, or the like
- 9/12 • • • • the chain, belt, or the like being laterally shiftable
- 9/121 • • • • • Rear derailleurs [2010.01]
- 9/122 • • • • • electrically or fluid actuated; Controls thereof [2010.01]
- 9/123 • • • • • changing gears automatically [2010.01]
- 9/124 • • • • • Mechanisms for shifting laterally [2010.01]
- 9/1242 • • • • • • characterised by the linkage mechanisms [2010.01]
- 9/1244 • • • • • • limiting or positioning the movement [2010.01]
- 9/1246 • • • • • • • using cams or plates [2010.01]
- 9/1248 • • • • • • • characterised by the use of biasing means, e.g. springs; Arrangements thereof [2010.01]
- 9/125 • • • • • • Mounting the derailleur on the frame [2010.01]
- 9/126 • • • • • • Chain guides; Mounting thereof [2010.01]
- 9/127 • • • • • • Mounting or guiding of cables [2010.01]
- 9/128 • • • • • • Accessories, e.g. protectors [2010.01]
- 9/131 • • • • • • Front derailleurs [2010.01]
- 9/132 • • • • • • electrically or fluid actuated; Controls thereof [2010.01]
- 9/133 • • • • • • changing gears automatically [2010.01]
- 9/134 • • • • • • Mechanisms for shifting laterally [2010.01]
- 9/1342 • • • • • • • characterised by the linkage mechanisms [2010.01]
- 9/1344 • • • • • • • limiting or positioning the movement [2010.01]
- 9/1346 • • • • • • • • using cams or plates [2010.01]
- 9/1348 • • • • • • • characterised by the use of biasing means, e.g. springs; Arrangements thereof [2010.01]
- 9/135 • • • • • • Mounting the derailleur on the frame [2010.01]
- 9/136 • • • • • • Chain guides; Mounting thereof [2010.01]
- 9/137 • • • • • • Mounting or guiding of cables [2010.01]
- 9/138 • • • • • • Accessories, e.g. protectors [2010.01]
- 9/14 • • • • the wheels being laterally shiftable
- 9/16 • Tensioning or adjusting equipment for chains, belts, or the like

- 11/00 **Transmissions characterised by use of interengaging toothed wheels or frictionally-engaging wheels** (with roller engaging the periphery of ground wheel B62M 6/35, B62M 6/75, B62M 13/00)
    - 11/02 • of unchangeable ratio
    - 11/04 • of changeable ratio
    - 11/06 • • with spur gear wheels (B62M 11/14 takes precedence)
    - 11/10 • • with bevel gear wheels (B62M 11/14 takes precedence)
    - 11/12 • • with frictionally-engaging wheels (B62M 11/14 takes precedence)
    - 11/14 • • with planetary gears
    - 11/16 • • • built in, or adjacent to, the ground-wheel hub
    - 11/18 • • • with a plurality of planetary gear units
  - 13/00 **Transmissions characterised by use of friction rollers engaging the periphery of the ground wheel** (for rider propelled cycles with additional source of power B62M 6/35, B62M 6/75) [1, 2010.01]
    - 13/02 • with changeable ratio, e.g. with roller of varying diameter
    - 13/04 • with means for moving roller into driving contact with ground wheel
  - 15/00 **Transmission characterised by use of crankshafts and coupling-rods**
  - 17/00 **Transmissions characterised by use of rotary shaft, e.g. cardan shaft**
  - 19/00 **Transmissions characterised by use of non-mechanical gearing, e.g. fluid gearing**
  - 21/00 **Transmissions characterised by use of resilient elements therein**
  - 23/00 **Transmissions characterised by use of other elements; Other transmissions**
    - 23/02 • characterised by the use of two or more dissimilar sources of power, e.g. transmissions for hybrid motorcycles (transmissions for wheeled vehicles using rider propulsion with additional source of power B62M 6/00) [1, 2010.01]
  - 25/00 **Actuators for gearing speed-change mechanisms specially adapted for cycles** (rider-operated controls for cycles in general B62K 23/00; gearing speed-change mechanisms F16H)
    - 25/02 • with mechanical transmitting systems, e.g. cables, levers
    - 25/04 • • hand actuated
    - 25/06 • • foot actuated
    - 25/08 • with electrical or fluid transmitting systems
- 
- 27/00 **Propulsion devices for sledges or the like** (pushed or pulled by persons or animals B62B, B62C; wind propulsion B62B 15/00)
    - 27/02 • power driven
  - 29/00 **Ground-engaging propulsion devices for cycles, sledges, or rider-propelled wheeled vehicles, not otherwise provided for**
    - 29/02 • using ground-engaging rods

## B63 SHIPS OR OTHER WATERBORNE VESSELS; RELATED EQUIPMENT

**B63B SHIPS OR OTHER WATERBORNE VESSELS; EQUIPMENT FOR SHIPPING** (air-cushion vehicles B60V; arrangements of vessel ventilation, heating, cooling, or air-conditioning B63J 2/00) [2]

### Subclass index

#### HULLS

Study; general characteristics.....	9/00, 1/00
General; adjustable keels; protection.....	3/00, 41/00, 59/00
Particular types.....	5/00, 7/00
Subdivision; cleaning of tanks.....	11/00, 57/00
SUPERSTRUCTURES; HULL OR SUPERSTRUCTURE OPENINGS.....	15/00, 19/00
EMPTYING, BALLASTING; STABILITY; SAFETY.....	13/00, 29/16, 39/00, 43/00
MOORING, SHIFTING; HANDLING LIFEBOATS.....	21/00, 23/00
ACCOMMODATION FOR CARGO OR PERSONS.....	25/00, 27/00, 29/00
ARRANGEMENTS OR ADAPTATIONS OF SIGNALLING OR LIGHTING DEVICES OR OF NAUTICAL INSTRUMENTS.....	45/00, 49/00
DETAILS AND ACCESSORIES FOR SHIPS.....	17/00
CONSTRUCTION, MAINTENANCE, CONVERSION, NOT OTHERWISE PROVIDED FOR.....	9/00
PARTICULAR KINDS OF SHIPS OR FLOATING STRUCTURES NOT OTHERWISE PROVIDED FOR.....	35/00, 38/00
BUOYS; MARKING NAVIGATION ROUTES.....	22/00, 51/00

<b>1/00 Hydrodynamic or hydrostatic features of hulls or of hydrofoils</b> (hulls peculiar to submarines B63B 3/13; keels B63B 3/38; determining hydrodynamic or hydrostatic features B63B 9/00; decreasing pitch, roll, or like unwanted vessel movements by using foils acting on ambient water B63B 39/06)	3/10 • Armoured hulls
1/02 • deriving lift mainly from water displacement (B63B 1/16 takes precedence)	3/12 • Frameless hulls
1/04 • • with single hull	3/13 • Hulls built to withstand hydrostatic pressure when fully submerged, e.g. submarine hulls
1/06 • • • Shape of fore part	3/14 • Hull parts (hull armour B63B 3/10)
1/08 • • • Shape of aft part	3/16 • • Shells (ports or closures therefor B63B 19/00)
1/10 • • with multiple hulls	3/18 • • • characterised by being formed predominantly of parts that may be developed into plane surfaces
1/12 • • • the hulls being interconnected rigidly	3/20 • • • of double type
1/14 • • • the hulls being interconnected resiliently	3/22 • • • with corrugations
1/16 • deriving additional lift from hydrodynamic forces	3/24 • • • Means for diminishing external ridges or protrusions
1/18 • • of hydroplane type (controlling submarine attitude or depth by hydroplanes B63G 8/18)	3/26 • • Frames
1/20 • • • having more than one planing surface (B63B 1/22 takes precedence)	3/28 • • • of transverse type; Stringers
1/22 • • • with adjustable planing surfaces	3/30 • • • • Bilge knees; Beam knees
1/24 • • of hydrofoil type	3/32 • • • Web frames; Web beams
1/26 • • • having more than one hydrofoil (B63B 1/28 takes precedence)	3/34 • • • of longitudinal type; Bulkhead connections
1/28 • • • with movable hydrofoils	3/36 • • • Combined frame systems
1/30 • • • • retracting or folding	3/38 • • Keels (movable keels B63B 41/00)
1/32 • Other means for varying the inherent hydrodynamic characteristics of hulls	3/40 • • Stern posts; Stern frames
1/34 • • by reducing surface friction	3/42 • • Shaft brackets
1/36 • • • using mechanical means	3/44 • • Bilge keels (stabilising aspect B63B 39/06)
1/38 • • • using air bubbles or air layers	3/46 • • Stems
1/40 • • by diminishing wave resistance	3/48 • • Decks (planking B63B 5/06)
<b>3/00 Constructions of hulls</b> (non-metallic hulls B63B 5/00; designing, building, maintaining, or repairing methods B63B 9/00)	3/50 • • • of vaulted type
3/02 • Hulls assembled from prefabricated sub-units	3/52 • • • Pillars; Deck girders
3/04 • • with permanently-connected sub-units	3/54 • • • Hatch openings
3/06 • • • the sub-units being substantially identical	3/56 • • Bulkheads; Bulkhead reinforcements (arrangements of watertight doors B63B 43/24)
3/08 • • with detachably-connected sub-units	3/58 • • • with flat plating
3/09 • Hulls constructed of non-magnetic metal	3/60 • • • with curved or corrugated plating
	3/62 • • Double bottoms; Tank tops
	3/64 • • • Keelsons
	3/66 • • Gratings
	3/68 • • Panellings; Linings, e.g. for insulating purposes
	3/70 • • Reinforcements for carrying localised loads, e.g. propulsion plant, guns

<b>5/00</b>	<b>Hulls characterised by their construction of non-metallic material</b>	19/06	• • readily detachable
5/02	• made predominantly of wood	19/08	• Ports or like openings in vessels' sides
5/04	• • Carcasses	19/10	• • Coal ports
5/06	• • Decks; Shells	19/12	• Hatches; Hatchways (hatch coamings B63B 3/54)
5/08	• • • with single-layer planking	19/14	• • Hatch covers (opening devices in general E05F)
5/10	• • • with multiple-layer planking	19/16	• • • with detachable boards
5/12	• made predominantly of wood with metal reinforcement, i.e. composite construction	19/18	• • • slidable
5/14	• made predominantly of concrete, e.g. reinforced	19/19	• • • foldable [3]
5/16	• • monolithic	19/197	• • • • actuated by fluid pressure [3]
5/18	• • built-up from elements	19/203	• • • • actuated by cables or the like [3]
5/20	• • • in combination with elements of other materials	19/21	• • • of roll-up type [3]
5/22	• • with reinforcing members external to shell	19/22	• • Hatch beams
5/24	• made predominantly of plastics	19/24	• • Hatch fastenings, e.g. cleats
		19/26	• • Gaskets; Draining means
		19/28	• • Other safety devices
<b>7/00</b>	<b>Collapsible, foldable, inflatable, or like vessels</b> (foldable pontoons B63B 35/36)	<b>21/00</b>	<b>Tying-up; Shifting, towing, or pushing equipment; Anchoring</b> (dynamic anchoring B63H 25/00; equipment for shipping on coasts, in harbours or on other fixed marine structures, e.g. for landing purposes, E02B) [4]
7/02	• comprising only rigid parts	21/02	• Magnetic mooring equipment
7/04	• • sectionalised	21/04	• Fastening or guiding equipment for chains, ropes, hawsers, or the like
7/06	• having parts of non-rigid material	21/06	• • Bollards
7/08	• • inflatable (connection of valves to inflatable elastic bodies B60C 29/00)	21/08	• • Clamping devices (in general F16B)
<b>9/00</b>	<b>Methods of designing, building, maintaining, converting, refitting, repairing, or determining properties of, vessels, not otherwise provided for</b> (shuttering for building concrete vessels E04G) [2]	21/10	• • Fairleads
9/02	• using towing tanks or model basins for designing	21/12	• • Rat guards
9/04	• Rebuilding ships, e.g. increasing tonnage	21/14	• • Hawse-holes; Hawse-pipes; Hawse-hole closures
9/06	• Methods of building hulls [2]	21/16	• using winches (winches <u>per se</u> B66D)
9/08	• Determining vessel properties with respect to stability or balance [2]	21/18	• Stoppers for anchor chains
<b>11/00</b>	<b>Interior subdivision of hulls</b> (bulkhead space construction B63B 3/56)	21/20	• Adaptations of chains, ropes, hawsers, or the like, or of parts thereof (chains, ropes or hawsers in general, <u>see</u> the relevant subclasses, e.g. F16G)
11/02	• Arrangement of bulkheads, e.g. defining cargo spaces	21/22	• Handling or lashing anchors
11/04	• Constructional features of bunkers or ballast tanks, e.g. with elastic walls (cleaning of tanks B63B 57/00)	21/24	• Anchors
11/06	• Propeller-shaft tunnels	21/26	• • securing to bed
<b>13/00</b>	<b>Conduits for emptying or ballasting; Self-bailing equipment; Scuppers</b> (draining means for hatches B63B 19/26; centrifugal bilge-water separators B04; pipes in general F16L)	21/27	• • • by suction [2]
13/02	• Ports for passing water through vessels' sides	21/28	• • • driven-in by explosive charge
<b>15/00</b>	<b>Superstructures; Arrangements or adaptations of masts</b> (loading or unloading equipment B63B 27/00; sails, running rigging B63H; masts or staying in general E04H)	21/29	• • • by weight, e.g. flukeless weight anchors [2]
15/02	• Staying of masts or of other superstructures	21/30	• • rigid when in use [3]
<b>17/00</b>	<b>Vessels parts, details, or accessories, not otherwise provided for</b>	21/32	• • • with one fluke
17/02	• Awnings	21/34	• • • with two or more flukes
17/04	• Stanchions; Guard-rails	21/36	• • • • foldable
17/06	• Refuse discharge, e.g. for ash (removal of domestic or like refuse B65F)	21/38	• • pivoting when in use [3]
<b>19/00</b>	<b>Arrangements or adaptations of ports, doors, windows, port-holes, or other openings or covers</b> (scuppers B63B 13/00; arrangements of watertight doors in bulkheads B63B 43/24)	21/40	• • • with one fluke
19/02	• Clear-view screens	21/42	• • • • of ploughshare type
19/04	• Air-catching equipment related to windows or port-holes (ventilation B63J 2/00)	21/44	• • • with two or more flukes
		21/46	• • with variable, e.g. sliding, connection to chain [2]
		21/48	• • Sea-anchors; Drogues
		21/50	• Anchoring arrangements for special vessels, e.g. for floating drilling platforms or dredgers
		21/54	• Boat-hooks or the like
		21/56	• Towing or pushing equipment (tugs B63B 35/66)
		21/58	• • Adaptations of hooks for towing; Towing-hook mountings (hooks in general F16B)
		21/60	• • • Quick releases
		21/62	• • characterised by moving of more than one vessel (rigid interconnections between pontoons B63B 35/38)
		21/64	• • Equipment for towing or pushing vessels by vehicles or beings moving forward on ground-based paths along water-way (boat-hooks or the like B63B 21/54; shore- or ground-based equipment <u>per se</u> , e.g. vehicles, rails, <u>see</u> the relevant classes) [2]



- 21/66 • • Equipment specially adapted for towing underwater objects or vessels, e.g. fairings for tow-cables (salvaging underwater vessels or objects B63C 7/00; towed underwater vessels B63G 8/42) [3]
- 22/00 **Buoys** (means for indicating the location of underwater objects B63C 7/26; life-buoys, e.g. rings, B63C 9/08) [4]
  - 22/02 • specially adapted for mooring a vessel [4]
  - 22/04 • Anchoring arrangements [4]
  - 22/06 • • with means to cause the buoy to surface in response to a transmitted signal [4]
  - 22/08 • • having means to release or urge to the surface a buoy on submergence thereof, e.g. to mark location of a sunken object [4]
  - 22/10 • • • Water soluble or water weakened means, i.e. buoy released by buoy-to-object securing means being destroyed on contact with water [4]
  - 22/12 • • • the surfacing of the buoy being assisted by a gas released or generated on submergence of the buoy [4]
  - 22/14 • • • Buoy-to-object securing means responsive to hydrostatic pressure [4]
  - 22/16 • specially adapted for marking a navigational route (signalling or lighting devices B63B 45/00) [4]
  - 22/18 • having means to control attitude or position, e.g. reaction surfaces or tether [4]
  - 22/20 • • Ballast means [4]
  - 22/22 • inflatable, including gas generating means (B63B 22/12 takes precedence; connection of valves to inflatable elastic bodies B60C 29/00) [4]
  - 22/24 • container type, i.e. having provision for the storage of material [4]
  - 22/26 • • having means to selectively release contents, e.g. swivel couplings (arrangements between ships and off-shore structures for loading or unloading, using pipe-lines B63B 27/34; pipe joints or couplings, in general F16L) [4]
  - 22/28 • • submerged when not in use [4]
- 23/00 **Equipment for handling lifeboats or the like**
  - 23/02 • Davits, i.e. devices having arms for lowering boats by cables or the like
  - 23/04 • • with arms pivoting on substantially-horizontal axes, e.g. gravity type
    - 23/06 • • • with actual pivots
    - 23/08 • • • • the arms being articulated
    - 23/10 • • • • with positive drive of the arms
    - 23/12 • • • with simulated pivots
    - 23/14 • • • • using linkages
    - 23/16 • • • • using guide tracks
  - 23/18 • • with arms pivoting on substantially-vertical axes
  - 23/20 • • • Davits with single arms (cranes in general B66C)
    - 23/22 • • • • Slings or the like therefor
    - 23/24 • • • • Slewing equipment therefor
  - 23/26 • • with rectilinear translation of boat before lowering
  - 23/28 • Devices for projecting or releasing boats for free fall
  - 23/30 • Devices for guiding boats to water surface
  - 23/32 • • Rigid guides, e.g. having arms pivoted near waterline
  - 23/34 • • Guiding means for lowering by cables, e.g. for listing ships
    - 23/36 • • • Skid fenders
    - 23/38 • Transport of boats to davits or the like
- 23/40 • Use of lowering or hoisting gear
  - 23/42 • • with braking equipment
  - 23/44 • • • on the ship
  - 23/46 • • • in the boat
  - 23/48 • • using winches for boat handling (winches per se B66D)
    - 23/50 • • • with tensioning gear
    - 23/52 • • • with control of winches from boat
  - 23/54 • • with trimming equipment
    - 23/56 • • • controlled from boat
  - 23/58 • • with tackle-engaging or release gear
  - 23/60 • • Additional connections between boat and davit
  - 23/62 • Fastening or storing of boats on deck
  - 23/64 • • Lashings; Covers
  - 23/66 • • Blocks; Chocks
    - 23/68 • • • for stacking boats
  - 23/70 • Condition-responsive handling equipment, e.g. automatic release of boat from lowering tackle upon contact with water [4]
- 25/00 **Load-accommodating arrangements, e.g. stowing, trimming; Vessels characterised thereby** (constructive aspects of cargo-spaces B63B 11/00; hatches, hatchways B63B 19/12; trimming otherwise than by cargo division. e.g. by use of ballast, B63B 43/06, B63B 43/08)
  - 25/02 • for bulk goods
  - 25/04 • • solid
    - 25/06 • • • for cereals
  - 25/08 • • fluid
    - 25/10 • • • open to ambient air
    - 25/12 • • • closed
      - 25/14 • • • • pressurised
      - 25/16 • • • • heat-insulated (insulating panellings B63B 3/68; heating or cooling B63J)
  - 25/18 • Detachable decks
    - 25/20 • • for motor vehicles or the like
  - 25/22 • for palletised articles
  - 25/24 • Means for preventing unwanted cargo movement, e.g. dunnage
    - 25/26 • for frozen goods
    - 25/28 • for deck loads
- 27/00 **Arrangement of ship-based loading or unloading equipment for cargo or passengers** (self-discharging barges or lighters B63B 35/30; shore-based equipment B65G 67/60; elevators, escalators or moving walkways per se B66B; floating cranes B66C 23/52; loading or unloading devices per se, see the relevant subclasses, e.g. B65G, B66C, B67D) [3]
 

**Note(s)**

Groups B63B 27/30-B63B 27/36 take precedence over groups B63B 27/04-B63B 27/28.

  - 27/04 • of derricks (derricks per se B66C 23/60) [3]
  - 27/08 • of winches (winches per se B66D) [3]
  - 27/10 • of cranes (cranes per se B66C) [3]
  - 27/12 • • of gantry type [3]
  - 27/14 • of ramps, gangways or outboard ladders (inboard ladders B63B 29/20; loading ramps per se B65G 69/28; ladders per se E06C) [3]
  - 27/16 • of lifts or hoists [3]
  - 27/18 • of cableways, e.g. with breeches-buoys (cableways per se B65G) [3]

- 27/22 • of conveyers, e.g. of endless-belt or screw-type (arrangement of devices with throwing action B63B 27/26; arrangement of chutes B63B 27/28; conveyers per se B65G) [3, 6]
- 27/24 • of pipe-lines (pipe-lines per se F17D) [3]
- 27/25 • • for fluidised bulk material [3]
- 27/26 • of devices with throwing action (mechanical throwing machines for articles or solid materials per se B65G 31/00) [3]
- 27/28 • of chutes (chutes per se B65G 11/00) [3]
- 27/30 • for transfer at sea between ships or between ships and off-shore structures [3]
- 27/32 • • using cableways [3]
- 27/34 • • using pipe-lines [3]
- 27/36 • for floating cargo (devices for facilitating retrieval of floating objects per se B66C 13/02) [3]
- 29/00 Accommodation for crew or passengers not otherwise provided for**
- 29/02 • Cabins or other living spaces; Construction or arrangement thereof
- 29/04 • • Furniture peculiar to vessels (floatable furniture B63C 9/30)
- 29/06 • • • Fastening to floors
- 29/08 • • • Storm guards on tables, e.g. fiddles
- 29/10 • • • Berths; Mounting ladders therefor
- 29/12 • • • Self-levelling mountings
- 29/14 • • Closet or like flushing arrangements; Washing or bathing facilities peculiar to ships
- 29/16 • Soil-water discharges
- 29/18 • Arrangements or adaptations of swimming pools
- 29/20 • Arrangements or adaptations of ladders (mounting ladders for berths B63B 29/10)
- 29/22 • Galleys [2]
- 35/00 Vessels or like floating structures adapted for special purposes** (vessels characterised by load-accommodating arrangements B63B 25/00; fire-fighting vessels A62C 29/00; submarines, mine-layers, or mine-sweepers B63G; large containers for use in or under water B65D 88/78) [5]
- 35/03 • Pipe-laying vessels (laying pipes under water F16L 1/12) [5]
- 35/04 • Cable-laying vessels [5]
- 35/06 • • for moving cable-ends from ship to shore [5]
- 35/08 • Ice-breakers [5]
- 35/10 • • having forced pitching or rolling equipment [5]
- 35/12 • • having ice-cutters [5]
- 35/14 • Fishing vessels (fishing A01K 69/00-A01K 97/00) [5]
- 35/16 • • Trawlers [5]
- 35/18 • • • adapted to dragging nets aboard [5]
- 35/20 • • • adapted to hoisting nets aboard [5]
- 35/22 • • Whale catchers; Whale factory vessels [5]
- 35/24 • • Fish holds [5]
- 35/26 • • • for live fish [5]
- 35/28 • Barges or lighters [5]
- 35/30 • • self-discharging [5]
- 35/32 • for collecting pollution from open water [5]
- Note(s)**  
If the apparatus for collecting pollution from open water is of interest apart from ship construction aspects, it is also classified in group E02B 15/00.
- 35/34 • Pontoon (floating bridges E01D 15/14) [5]
- 35/36 • • foldable [5]
- 35/38 • • Rigidly-interconnected pontoons [5]
- 35/40 • for transporting marine vessels [5]
- 35/42 • • with adjustable draught [5]
- 35/44 • Floating buildings, stores, drilling platforms, or workshops, e.g. carrying water-oil separating devices [5]
- 35/50 • Vessels or floating structures for aircraft (aircraft carriers B63G 11/00; flying-boat hulls, other flotation means for aircraft B64) [5]
- 35/52 • • Nets, slipways or the like, for recovering aircraft from the water [5]
- 35/53 • • Floating runways [3, 5]
- 35/54 • Ferries (propulsion of chain ferries B63H) [5]
- 35/56 • Lightships (marking of navigational route B63B 51/00) [5]
- 35/58 • Rafts, i.e. free floating waterborne vessels, of shallow draft, with little or no freeboard, and having a platform or floor for supporting a user (lifeboats, life-rafts or the like B63C 9/02) [4, 5]
- 35/607 • • having a platform or floor below the level of the buoyancy means, e.g. suspended basket type [4, 5]
- 35/613 • • with tubular shaped flotation members [4, 5]
- 35/62 • • formed from logs or the like [4, 5]
- 35/66 • Tugs (towing or pushing equipment B63B 21/56) [5]
- 35/68 • • for towing [5]
- 35/70 • • for pushing [5]
- 35/71 • Canoes, kayaks or the like (collapsible, foldable, inflatable or like vessels B63B 7/00) [4, 5]
- 35/73 • Other vessels or like floating structures for pleasure or sport [5]
- 35/74 • • Body supporting buoyant devices with seat [4, 5]
- 35/76 • • • Ring-shaped buoyant member [4, 5]
- 35/78 • • • U-shaped buoyant member [4, 5]
- 35/79 • • Surf-boards, e.g. sailboards [5]
- 35/81 • • Water skis; Water sledges [5]
- 35/83 • • Water shoes; Bog shoes [5]
- 35/85 • • Accessories not otherwise provided for, e.g. sticks for water skiing [5]
- 38/00 Vessels or like floating structures not otherwise provided for** (vessels characterised by load-accommodating arrangements B63B 25/00; fire-extinguishing vessels A62C 29/00; submarines, mine-layers or mine-sweepers B63G; large containers for use in or under water B65D 88/78) [5]
- 39/00 Equipment to decrease pitch, roll, or like unwanted vessel movements; Apparatus for indicating vessel attitude**
- 39/02 • to decrease vessel movements by displacement of masses [2]
- 39/03 • • by transferring liquids [2]
- 39/04 • to decrease vessel movements by using gyroscopes directly
- 39/06 • to decrease vessel movements by using foils acting on ambient water (constructional aspects of bilge keels B63B 3/44)
- 39/08 • to decrease vessel movements by using auxiliary jets or propellers (using auxiliary jets or propellers for steering or dynamic anchoring B63H 25/00)
- 39/10 • to decrease vessel movements by damping the waves, e.g. by pouring oil on water [2]
- 39/12 • for indicating draught or load
- 39/14 • for indicating inclination or duration of roll

- 41/00 Drop keels, e.g. centre boards, side boards** (keels integral with hull B63B 3/38; stabilising foils B63B 39/06)
- 43/00 Improving safety of vessels, e.g. damage control, not otherwise provided for** (fire-fighting in ships A62C 3/10)
- 43/02 • reducing risk of capsizing or sinking (by means of watertight doors in bulkheads B63B 43/24)
  - 43/04 • • by improving stability
  - 43/06 • • • using ballast tanks (conduits for emptying or ballasting B63B 13/00)
  - 43/08 • • • by transfer of solid ballast
  - 43/10 • • • by improving buoyancy
  - 43/12 • • • using inboard air containers
  - 43/14 • • • using outboard floating members
  - 43/16 • • • Temporary equipment for stopping leaks, e.g. collision mats
  - 43/18 • preventing collision; reducing collision damage
  - 43/20 • • Feelers
  - 43/24 • Arrangements of watertight doors in bulkheads
  - 43/26 • • of sliding type
  - 43/28 • • • with mechanical drive
  - 43/30 • • • with fluid drive
  - 43/32 • • of non-sliding type
- 45/00 Arrangement or adaptation of signalling or lighting devices** (arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q; life-buoys, -belts, -jackets, -suits or the like, characterised by signalling means B63C 9/20; lighting devices or systems therefor F21L, F21S) [4]
- 45/02 • the devices being intended to illuminate the way ahead or other areas of environments
- 45/04** • the devices being intended to indicate the vessel or parts thereof
- 45/06** • the devices being intended to illuminate vessels' decks or interior
- 45/08** • the devices being acoustic
- 49/00 Arrangements of nautical instruments or navigational aids** (nautical measuring instruments G01C; radio navigation, analogous arrangements using other waves G01S)
- 51/00 Marking of navigational route other than with buoys** (buoys specially adapted for marking a navigational route B63B 22/16) [4]
- 51/02 • with anchored lightships; by use of lighthouses [4]
  - 51/04 • with free-floating flares
- 57/00 Tank cleaning specially adapted for vessels** (tank cleaning in general B08B 9/08)
- 57/02 • by washing
  - 57/04 • by ventilating
- 59/00 Hull protection peculiar to vessels; Cleaning devices peculiar to vessels** (cleaning in general B08B; cleaning of vehicles in general, e.g. windscreen wipers, B60S; inhibiting corrosion of metals by anodic or cathodic protection C23F 13/00)
- 59/02 • Fenders integral with waterborne vessels or specially adapted therefor; Rubbing-strakes (fenders on coasts, in harbours or on other fixed marine structures E02B 3/26)
  - 59/04 • Preventing hull fouling (anti-fouling paints C09D 5/16) [3]
  - 59/06 • Cleaning devices for hulls [3]
  - 59/08 • • of underwater surfaces while afloat (B63B 59/10 takes precedence) [3]
  - 59/10 • • using trolleys or the like driven along the surface [3]
- B63C LAUNCHING, HAULING-OUT, OR DRY-DOCKING OF VESSELS; LIFE-SAVING IN WATER; EQUIPMENT FOR DWELLING OR WORKING UNDER WATER; MEANS FOR SALVAGING OR SEARCHING FOR UNDERWATER OBJECTS** (floating nets, floating slipways, or the like for recovering aircraft from the water B63B 35/52)

### Subclass index

#### LANDING, LAUNCHING

Dry-docking; storing on land; launching or hauling-out.....1/00, 15/00, 3/00

Transporting overland.....13/00

Slipway and dry-dock equipment.....5/00

SALVAGE, SEARCHING UNDER WATER; LIFE-SAVING.....7/00, 11/00, 9/00

WORKING UNDER WATER.....11/00

- 1/00 Dry-docking of vessels or flying-boats** (storing of vessels on land otherwise than by dry-docking B63C 15/00; mooring of vessels B63B 21/00; hydraulic-engineering aspects E02B)
- 1/02 • Floating dry-docks (ship transporters with adjustable draught B63B 35/42)
  - 1/04 • • self-docking
  - 1/06 • • Arrangements of pumping or filling equipment for raising or lowering docks
  - 1/08 • Dry docks (locks E02C 1/00) [2]
  - 1/10 • Centring devices
  - 1/12 • Docks adapted for special vessels, e.g. submarines

- 3/00 Launching or hauling-out, e.g. by landborne slipways; Slipways** (ship-borne guides for handling lifeboats or the like B63B 23/30; cranes, winches, or the like B66; ship-lifting for adapting to different water levels E02C)
- 3/02 • by longitudinal movement of vessel
  - 3/04 • by sideways movement of vessel
  - 3/06 • by vertical movement of vessel, e.g. by crane
  - 3/08 • Tracks on slipways
  - 3/10 • using releasing devices
  - 3/12 • using cradles (vehicles in general for transporting boats or the like B60P)
  - 3/14 • using braking means

**5/00 Equipment usable both on slipways and in dry docks**

- 5/02 • Stagings; Scaffolding; Shores or struts
- 5/04 • • Bilge or keel blocks

**7/00 Salvaging of disabled, stranded, or sunken vessels; Salvaging of vessel parts or furnishings, e.g. of safes; Salvaging of other underwater objects** (means for searching for underwater objects B63C 11/48)

- 7/02 • in which the lifting is done by hauling
- 7/04 • • using pontoons or the like
- 7/06 • in which lifting action is generated in, or adjacent to, vessels or objects
- 7/08 • • using rigid floats
- 7/10 • • using inflatable floats external to vessels or objects
- 7/12 • • by bringing air or floating bodies or material into vessels or objects
- 7/14 • using freezing for closing holes or for strengthening the vessel or the like
- 7/16 • Apparatus engaging vessels or objects
- 7/18 • • using nets
- 7/20 • • using grabs
- 7/22 • • using electromagnets or suction devices
- 7/24 • Apparatus for passing chains or the like under vessels or objects
- 7/26 • Means for indicating the location of underwater objects, e.g. sunken vessels (means for searching for underwater objects B63C 11/48; buoys in general B63B 22/00)
- 7/28 • Refloating stranded vessels
- 7/30 • Floatable safes (safes in general E05G)

**9/00 Life-saving in water** (life-saving in general A62B; arrangement or adaptation of signalling or lighting devices for ships, other waterborne vessels or for equipment for shipping B63B 45/00; rescue equipment specially adapted for submarine personnel B63G 8/40)

- 9/01 • Air-sea rescue devices, i.e. equipment carried by, and capable of being dropped from, an aircraft (inflatable vessels B63B 7/00; inflatable buoys B63B 22/22) [5]
- 9/02 • Lifeboats, life-rafts or the like, specially adapted for life-saving (B63C 9/01 takes precedence; floatable furniture B63C 9/30; boats in general B63B; inflatable vessels B63B 7/00; equipment for handling lifeboats or the like B63B 23/00; rafts B63B 35/58) [4, 5]
- 9/03 • • enclosed [5]
- 9/04 • • Life-rafts
- 9/05 • Shark screens, e.g. buoyant means combined with means to surround or otherwise enclose the user (B63C 9/06 takes precedence) [5]
- 9/06 • Floatable closed containers with accommodation for one or more persons inside (B63C 9/01 takes precedence) [5]
- 9/08 • Life-buoys, e.g. rings; Life-belts, jackets, suits, or the like (B63C 9/01 takes precedence; equipment for swimming A63B, e.g. swimming aids A63B 31/00) [5]
- 9/087 • • Body suits, i.e. substantially covering the user's body (diving suits B63C 11/04, B63C 11/10) [5]
- 9/093 • • • using solid buoyant material [5]
- 9/105 • • • having gas-filled compartments (connection of valves to inflatable elastic bodies B60C 29/00) [5]
- 9/11 • • covering the torso, e.g. harnesses [5]
- 9/115 • • • using solid buoyant material [5]

- 9/125 • • • having gas-filled compartments (connection of valves to inflatable elastic bodies B60C 29/00) [5]
- 9/13 • • attachable to a body member, e.g. arm, neck, head or waist [5]
- 9/135 • • • using solid buoyant material [5]
- 9/15 • • • having gas-filled compartments (connection of valves to inflatable elastic bodies B60C 29/00) [5]
- 9/18 • • Inflatable equipment characterised by the gas-generating device [5]
- 9/19 • • • Arrangements for puncturing gas-generating cartridges [5]
- 9/20 • • characterised by signalling means, e.g. lights (arrangement or adaptation of signalling or lighting devices for ships or other waterborne vessels B63B 45/00)
- 9/22 • Devices for holding or launching life-buoys, inflatable life-rafts, or other floatable life-saving equipment (equipment for handling life-boats or the like B63B 23/00)
- 9/23 • • Containers for inflatable life-saving equipment [5]
- 9/26 • Cast or life lines; Attachments thereto; Containers therefor (adaptations of aerial cableways to shipboard use B63B 27/18; guns for line-throwing F41F; line-carrying missiles F42B 12/68)
- 9/28 • Adaptations of vessel parts or furnishings to life-saving purposes
- 9/30 • • Floatable furniture
- 9/32 • Equipment adapted to use on ice

**11/00 Equipment for dwelling or working under water; Means for searching for underwater objects** (composition of chemical substances for use in breathing apparatus A62D 9/00; swimming aids or equipment A63B 31/00-A63B 35/00; submarines B63G 8/00)

- 11/02 • Divers' equipment
- 11/04 • • Resilient suits
- 11/06 • • • with rigid helmet
- 11/08 • • • Control of air pressure within suit, e.g. for controlling buoyancy
- 11/10 • • Rigid suits
- 11/12 • • Diving masks (swimming helmets, swimming goggles A63B 33/00)
- 11/14 • • • with forced air supply
- 11/16 • • • with air supply by suction from diver, e.g. schnorkels
- 11/18 • • Air supply (for diving masks B63C 11/14, B63C 11/16; respiratory apparatus in general A62B)
- 11/20 • • • from water surface
- 11/22 • • • carried by diver
- 11/24 • • • • in closed circulation
- 11/26 • • Communication means (electric communication in general H04)
- 11/28 • • Heating, e.g. of divers' suits, of breathing air
- 11/30 • • Ballast
- 11/32 • • Decompression arrangements; Exercise equipment
- 11/34 • Diving chambers with mechanical link, e.g. cable, to a base (manipulators B25J; diving chambers without mechanical link to a base B63G 8/00; caissons adapted to laying foundations E02D 23/00-E02D 27/00)
- 11/36 • • of closed type
- 11/38 • • • with entrance above water surface
- 11/40 • • • adapted to specific work

- 11/42 • • • with independent propulsion or directional control
- 11/44 • • of open type, e.g. diving-bells
- 11/46 • Divers' sleds or like craft, i.e. craft on which man in diving-suit rides
- 11/48 • Means for searching for underwater objects (means for indicating the location of sunken objects B63C 7/26; locating by use of the reflection or reradiation of radio or other waves G01S)
- 11/49 • • Floating structures with underwater viewing devices, e.g. with windows [5]

- 11/50 • • using grapnels
- 11/52 • Tools specially adapted for working underwater, not otherwise provided for [3]

**13/00 Equipment forming part of, or attachable to, vessels, facilitating transport over land** (harnesses attachable to vessels for personal carrying A45F; amphibious craft, land vehicles convertible for use on water B60F; land vehicles for carrying boats B60P)

**15/00 Storing of vessels on land otherwise than by dry-docking**

**B63G OFFENSIVE OR DEFENSIVE ARRANGEMENTS ON VESSELS; MINE-LAYING; MINE-SWEEPING; SUBMARINES; AIRCRAFT CARRIERS** (means of attack or defence in general, e.g. turrets, F41H)

### Subclass index

#### OFFENSIVE OR DEFENSIVE INSTALLATIONS OR ARRANGEMENTS

Guns, missile launchers.....	1/00
Launching torpedoes; defence against torpedoes.....	5/00, 9/00
Defence or attack against sub- marines, by depth charges or otherwise.....	6/00, 9/00
Mines: laying; sweeping; other defence.....	6/00, 7/00, 9/00
Other defensive or offensive arrangements.....	13/00
Ammunition handling or storing.....	3/00
SUBMARINES; AIRCRAFT CARRIERS.....	8/00, 11/00

- 1/00 Arrangements of guns or missile launchers; Vessels characterised thereby** (submarines B63G 8/00; guns, missile launchers F41)
- 3/00 Arrangements of ammunition stores or handlers** (specially for submarines B63G 8/00; feeding ammunition missiles or projectiles to guns in general F41A 9/00); **Vessels characterised thereby** (general cargo aspects B63B)
  - 3/02 • for torpedoes
  - 3/04 • for missiles
  - 3/06 • for mines or depth charges
- 5/00 Vessels characterised by adaptation to torpedo-launching** (submarines B63G 8/00; torpedo-launching per se F41F 3/00)
- 6/00 Laying of mines or depth charges; Vessels characterised thereby** (arrangements on submarines for mine-laying B63G 8/33) [2]
- 7/00 Mine-sweeping; Vessels characterised thereby**
  - 7/02 • Mine-sweeping means; Means for destroying mines
  - 7/04 • • by means of cables
  - 7/06 • • of electromagnetic type
  - 7/08 • • of acoustic type
- 8/00 Underwater vessels, e.g. submarines** (submarine hulls B63B 3/13; diving chambers with mechanical link, e.g. cable, to a base B63C 11/34; divers' sleds B63C 11/46; torpedoes F42B 19/00)
  - 8/04 • Superstructure
  - 8/06 • • Conning-towers
  - 8/08 • Propulsion (nuclear propulsion B63H 21/18; submerged exhausting apparatus F01N 13/12; propulsion power plants or units per se, see the relevant classes)
  - 8/10 • • using steam plant
  - 8/12 • • using internal-combustion engines

- 8/14 • Control of attitude or depth (of torpedoes F42B 19/00)
- 8/16 • • by direct use of propellers or jets
- 8/18 • • by hydroplanes
- 8/20 • • Steering equipment (B63G 8/16, B63G 8/18 take precedence; steering of vessels in general B63H 25/00) [2]
- 8/22 • • Adjustment of buoyancy by water ballasting; Emptying equipment for ballast tanks (stabilising vessels using ballast tanks B63B 43/06)
- 8/24 • • Automatic depth adjustment; Safety equipment for increasing buoyancy, e.g. detachable ballast, floating bodies
- 8/26 • • Trimming equipment
- 8/28 • Arrangement of offensive or defensive equipment
- 8/30 • • of artillery or missile-launching means
- 8/32 • • of torpedo-launching means (torpedo-launching means per se F41F 3/00); of torpedo stores or handlers [2]
- 8/33 • • of mine-laying means (mine-laying vessels other than submarines B63G 6/00) [2]
- 8/34 • • Camouflage (for other vessels B63G 13/02; in general F41H 3/00)
- 8/36 • Adaptations of ventilation, cooling, heating, or air-conditioning (reconditioning air in sealed chambers A62B 11/00; for vessels in general B63J 2/00; air-conditioning in general F24F)
- 8/38 • Arrangement of visual or electronic watch equipment, e.g. of periscopes, of radar
- 8/39 • Arrangements of sonic watch equipment, e.g. low-frequency, sonar
- 8/40 • Rescue equipment for personnel (life-saving in water, not specially adapted for submarine personnel B63C)
- 8/41 • • Capsules, chambers, water-tight boats, or the like, detachable from the submarine [2]
- 8/42 • Towed underwater vessels [2]

## B63G

### 9/00 Other offensive or defensive arrangements on vessels against submarines, torpedoes, or mines

- 9/02 • Means for protecting vessels against torpedo attack (armoured hulls B63B 3/10)
- 9/04 • • Nets or the like (net barriers for harbour defence F41H 11/00)
- 9/06 • for degaussing vessels (demagnetising in general H01F 13/00)

**11/00 Aircraft carriers, i.e. warships equipped with a flight deck on which airplanes can be launched and landed and with a hangar deck for servicing airplanes** (other vessels or floating structures for aircraft B63B 35/50; aircraft-carrier-deck installations B64F 1/00)

### 13/00 Other offensive or defensive arrangements on vessels; Vessels characterised thereby

- 13/02 • Camouflage (for submarines B63G 8/34; in general F41H 3/00) [2]

**B63H MARINE PROPULSION OR STEERING** (propulsion of air-cushion vehicles B60V 1/14; peculiar to submarines, other than nuclear propulsion, B63G; peculiar to torpedoes F42B 19/00)

## Subclass index

### PROPULSIVE ELEMENTS; ARRANGEMENTS THEREOF

- Acting directly on water: elements; arrangements.....1/00, 3/00, 5/00
- Arrangements of means acting directly on air.....7/00
- Acted on by wind propulsive devices.....9/00

### PARTICULAR MEANS

- by reaction; by muscle power; by anchored cable; wind motors driving water-engaging devices.....11/00, 16/00, 15/00, 13/00
- Other.....19/00

### OUTBOARD PROPULSION UNITS.....20/00

### PROPULSION POWER PLANT.....21/00

### TRANSMISSION FROM POWER PLANT TO PROPULSIVE ELEMENTS.....23/00

### STEERING, DYNAMIC ANCHORING.....25/00

### 1/00 Propulsive elements directly acting on water (jet propulsion B63H 11/00; attachment of propellers on shafts B63H 23/34)

- 1/02 • of rotary type (endless-track type B63H 1/34)
- 1/04 • • with rotation axis substantially at right angles to propulsive direction, e.g. paddle wheels
- 1/06 • • • with adjustable vanes or blades
- 1/08 • • • • with cyclic adjustment
- 1/10 • • • • • with blades extending axially from a disc-shaped rotary body
- 1/12 • • with rotation axis substantially in propulsive direction
- 1/14 • • • Propellers (pitch changing B63H 3/00)
- 1/15 • • • • having vibration damping means (anti-vibration mounting of propulsion plant B63H 21/30; means for damping vibration in general F16F) [4]
- 1/16 • • • • having a shrouding ring attached to blades
- 1/18 • • • • with means for diminishing cavitation, e.g. supercavitation
- 1/20 • • • • Hubs; Blade connections
- 1/22 • • • • • the blades being foldable
- 1/24 • • • • • • automatically foldable or unfoldable
- 1/26 • • • • Blades
- 1/28 • • • • Other means for improving propeller efficiency (water-guiding elements formed by shape of hull B63H 5/00)
- 1/30 • of non-rotary type
- 1/32 • • Flaps, pistons, or the like, reciprocating in propulsive direction
- 1/34 • • of endless-track type
- 1/36 • • Swinging flaps, e.g. fishtail type [4]
- 1/37 • • Moving-wave propellers, i.e. wherein the propelling means comprise a flexible undulating structure [4]

- 1/38 • characterised solely by flotation properties, e.g. drums

### 3/00 Propeller-blade pitch changing

- 3/02 • actuated by control element coaxial with propeller shaft, e.g. the control element being rotary
- 3/04 • • the control element being reciprocable
- 3/06 • characterised by use of non-mechanical actuating means, e.g. electrical
- 3/08 • • fluid
- 3/10 • characterised by having pitch control conjoint with propulsion-plant control
- 3/12 • the pitch being adjustable only when propeller is stationary

### 5/00 Arrangements on vessels of propulsion elements directly acting on water

- 5/02 • of paddle wheels, e.g. of stern wheels
- 5/03 • • movably mounted with respect to the hull, e.g. having means to reposition paddle wheel assembly, or to retract paddle or to change paddle attitude [4]
- 5/04 • • with stationary water-guiding elements
- 5/07 • of propellers (forming part of outboard propulsion units B63H 20/00) [6]
- 5/08 • • of more than one propeller
- 5/10 • • • of coaxial type, e.g. of counter-rotative type
- 5/125 • • • movably mounted with respect to hull, e.g. adjustable in direction (movably mounted for steering purposes only B63H 25/42) [6]
- 5/14 • • characterised by being mounted in non-rotating ducts or rings, e.g. adjustable for steering purposes (shrouding ring attached to blades B63H 1/16; jet propulsion B63H 11/00)
- 5/15 • • • Nozzles, e.g. Kort-type [4]

- 5/16 • • characterised by being mounted in recesses; with stationary water-guiding elements; Means to prevent fouling of the propeller, e.g. guards, cages or screens (anti-fouling paints C09D 5/16)
- 5/18 • • of emergency propellers, e.g. arranged at the side of the vessel
- 5/20 • • • movable from a working position to a non-working position [4]
- 7/00 **Arrangements of propulsive devices directly acting on air** (jet propulsion B63H 11/00)
- 7/02 • using propellers (air-screws of aircraft type B64C)
- 9/00 **Propulsive devices directly acted on by wind; Arrangements thereof** (air-driven propellers driving underwater propulsive elements B63H 13/00)
- 9/02 • using Magnus effect
- 9/04 • using sails or like wind-catching surfaces (sailing sledges or ice boats B62B 15/00)
- 9/06 • • Construction or types of sails; Arrangements thereof on vessels
- 9/08 • • Connections of sails to masts, spars, or the like
- 9/10 • • • Spars; Running rigging, e.g. reefing equipment (staying of masts B63B 15/02)
- 11/00 **Effecting propulsion by jets, i.e. reaction principle** (steering by jet action B63H 25/46; power plant per se, see the relevant classes)
- 11/01 • having means to prevent foreign material from clogging fluid passageway [4]
- 11/02 • the propulsive medium being ambient water
- 11/04 • • by means of pumps
- 11/06 • • • of reciprocating type
- 11/08 • • • of rotary type
- 11/09 • • • by means of pressure pulses applied to a column of liquid, e.g. by ignition of an air/gas or vapour mixture [4]
- 11/10 • • having means for deflecting jet or influencing cross-section thereof
- 11/103 • • • having means to increase efficiency of propulsive fluid, e.g. discharge pipe provided with means to improve the fluid flow [4]
- 11/107 • • • Direction control of propulsive fluid [4]
- 11/11 • • • • with bucket or clamshell-type reversing means [4]
- 11/113 • • • • Pivoted outlet [4]
- 11/117 • • • • Pivoted vane [4]
- 11/12 • the propulsive medium being steam or other gas
- 11/14 • • the gas being produced by combustion
- 11/16 • • the gas being produced by other chemical processes
- 13/00 **Effecting propulsion by wind motors driving water-engaging propulsive elements**
- 15/00 **Effecting propulsion by use of vessel-mounted driving mechanisms co-operating with anchored chains or the like**
- 16/00 **Effecting propulsion by muscle power** (swimming frameworks with swimmer-operated driving mechanisms A63B 35/00; land-based training equipment for rowing or sculling A63B 69/06)
- 16/02 • Movable thwarts; Foot-rests
- 16/04 • Oars; Sculls; Paddles; Poles
- 16/06 • Rowlocks; Mountings therefor
- 16/067 • • Rowlocks mounted on a structure extending beyond the gunwale of the vessel [4]
- 16/073 • • having oar shaft restraining means [4]
- 16/08 • Other apparatus for converting muscle power into propulsive effort (general features of propulsion elements, see the relevant groups)
- 16/10 • • for bow-facing rowing
- 16/16 • • using reciprocating pull cable, i.e. a strand-like member movable alternately backward and forward [4]
- 16/18 • • using sliding handle or pedal, i.e. the motive force being transmitted to a propelling means by means of a lever operated by the hand or foot of the occupant [4]
- 16/20 • • using rotary cranking arm [4]
- 19/00 **Effecting propulsion of vessels, not otherwise provided for**
- 19/02 • by using energy derived from movement of ambient water, e.g. from rolling or pitching of vessels
- 19/04 • • propelled by water current
- 19/06 • by discharging gas into ambient water (with jet action B63H 11/12; for reducing surface friction B63B 1/38)
- 19/08 • by direct engagement with water-bed or ground
- 20/00 **Outboard propulsion units, i.e. propulsion units having a substantially vertical power leg mounted outboard of a hull and terminating in a propulsion element, e.g. "outboard motors", Z-drives** (power plants per se, see the relevant classes); **Arrangements thereof on vessels [6]**
- 20/02 • Mounting of propulsion units (B63H 20/08 takes precedence) [6]
- 20/04 • • in a well [6]
- 20/06 • • on an intermediate support [6]
- 20/08 • Means enabling movement of the position of the propulsion element, e.g. for trim, tilt, or steering (transmissions allowing movement of the propulsion element B63H 20/14); Control of trim or tilt (initiating means for steering B63H 25/02) [6]
- 20/10 • • Means enabling trim or tilt, or lifting of the propulsion element when an obstruction is hit; Control of trim or tilt [6]
- 20/12 • • Means enabling steering [6]
- 20/14 • Transmission between propulsion power unit and propulsion element [6]
- 20/16 • • allowing movement of the propulsion element in a horizontal plane only, e.g. for steering [6]
- 20/18 • • allowing movement of the propulsion element about a longitudinal axis, e.g. the through transom shaft (B63H 20/22 takes precedence) [6]
- 20/20 • • with provision for reverse drive [6]
- 20/22 • • allowing movement of the propulsion element about at least a horizontal axis without disconnection of the drive, e.g. using universal joints [6]
- 20/24 • Exhaust gas outlets [6]
- 20/26 • • passing through the propeller or its hub [6]
- 20/28 • Cooling-water intakes [6]
- 20/30 • • for flushing [6]
- 20/32 • Housings [6]
- 20/34 • • comprising stabilising fins [6]
- 20/36 • Transporting or testing stands; Protection of power legs [6]

**21/00 Use of propulsion power plant or units on vessels** (use of outboard propulsion units B63H 20/00; hull reinforcements for carrying propulsion power plant or units B63B 3/70; propulsion power plant or units per se, see the relevant classes) [6]

**Note(s)**

This group covers:

- arrangements of propulsion power plant or units on vessels;
  - to some extent, adaptations of such plant or units to facilitate such arrangements.
- 21/02 • the vessels being steam-driven (B63H 21/18 takes precedence)
- 21/04 • • relating to positive-displacement steam engines
- 21/06 • • relating to steam turbines
- 21/08 • • relating to steam boilers
- 21/10 • • relating to condensers or engine-cooling fluid heat-exchangers
- 21/12 • the vessels being motor-driven (B63H 21/175, B63H 21/18 take precedence) [4]
- 21/14 • • relating to internal-combustion engines
- 21/16 • • relating to gas turbines
- 21/165 • • by hydraulic fluid motor, i.e. wherein a liquid under pressure is utilised to rotate the propelling means [4]
- 21/17 • • by electric motor (electrically-propelled vehicles B60L) [4]
- 21/175 • the vessel being powered by land vehicle supported by vessel [4]
- 21/18 • the vessels being powered by nuclear energy
- 21/20 • the vessels being powered by combinations of different types of propulsion units
- 21/21 • Control means for engine or transmission, specially adapted for use on marine vessels [4]
- 21/22 • the propulsion power units being controlled from exterior of engine room, e.g. from navigation bridge; Arrangements of order telegraphs (order telegraphs per se G08B 9/00)
- 21/30 • Mounting of propulsion plant or unit, e.g. for anti-vibration purposes (hull reinforcements therefor B63B 3/70; vibration-dampers, suppression of vibration in systems F16F; engine beds F16M)
- 21/32 • Arrangements of propulsion power-unit exhaust uptakes; Funnels peculiar to vessels (engine exhausts in general F01N; flue devices for furnaces in general F23J)
- 21/34 • • having exhaust-gas deflecting means
- 21/36 • Covers or casing arranged to protect plant or unit from marine environment (hull construction B63B 3/00) [4]
- 21/38 • Apparatus or methods specially adapted for use on marine vessels, for handling power plant or unit liquids, e.g. lubricants, coolants, fuels or the like (lubricating or cooling engines in general F01-F04) [4]

**23/00 Transmitting power from propulsion power plant to propulsive elements** (changing pitch of propellers B63H 3/00; adaptation of transmission to allow adjustment in direction of propellers B63H 5/125; transmission between wind motors and propulsive elements B63H 13/00, in outboard propulsion units B63H 20/14; adaptation of transmission to allow adjustment of location of propellers B63H 20/08; for vehicles in general B60K; driving auxiliary machinery B63J; transmission elements per se F16)

- 23/02 • with mechanical gearing

- 23/04 • • the main transmitting element, e.g. shaft, being substantially vertical
- 23/06 • • for transmitting drive from a single propulsion power unit
- 23/08 • • • with provision for reversing drive
- 23/10 • • for transmitting drive from more than one propulsion power unit (for synchronisation of propulsive elements B63H 23/28)
- 23/12 • • • allowing combined use of the propulsion power units
- 23/14 • • • • with unidirectional drive or where reversal is immaterial
- 23/16 • • • • characterised by provision of reverse drive
- 23/18 • • • for alternative use of the propulsion power units
- 23/20 • • • • with separate forward and astern propulsion power units, e.g. turbines
- 23/22 • with non-mechanical gearing
- 23/24 • • electric
- 23/26 • • fluid
- 23/28 • with synchronisation of propulsive elements
- 23/30 • characterised by use of clutches
- 23/32 • Other parts
- 23/34 • • Propeller shafts; Paddle-wheel shafts; Attachment of propellers on shafts (shafts in general F16C; attachment of a member on a shaft in general F16D 1/06)
- 23/35 • • • Shaft braking or locking, i.e. means to slow or stop the rotation of the propeller shaft or to prevent the shaft from initial rotation [4]
- 23/36 • • Shaft tubes (propeller-shaft tunnels B63B 11/06; shaft-tube seals F16J)

**25/00 Steering; Slowing-down otherwise than by use of propulsive elements** (using adjustably-mounted propeller ducts or rings for steering B63H 5/14; using movably-installed outboard propulsion units B63H 20/00); **Dynamic anchoring, i.e. positioning vessels by means of main or auxiliary propulsive elements** (anchoring, other than dynamic, B63B 21/00; equipment to decrease pitch, roll, or like unwanted vessel movements by auxiliary jets or propellers B63B 39/08)

- 25/02 • Initiating means for steering
- 25/04 • • automatic, e.g. reacting to compass
- 25/06 • Steering by rudders (by rudders carrying propellers B63H 25/42)
- 25/08 • • Steering gear
- 25/10 • • • with mechanical transmission
- 25/12 • • • with fluid transmission
- 25/14 • • • power assisted; power driven, i.e. using steering engine
- 25/16 • • • • with alternative muscle or power- operated steering
- 25/18 • • • • Transmitting of movement of initiating means to steering engine
- 25/20 • • • • • by mechanical means
- 25/22 • • • • • by fluid means
- 25/24 • • • • • by electrical means
- 25/26 • • • • • Steering engines
- 25/28 • • • • • of fluid type
- 25/30 • • • • • • hydraulic
- 25/32 • • • • • • steam
- 25/34 • • • • • Transmitting of movement of engine to rudder, e.g. using quadrants, brakes
- 25/36 • • Rudder-position indicators
- 25/38 • • Rudders (stern posts B63B 3/40)



- 25/40 • • • using Magnus effect
- 25/42 • Steering or dynamic anchoring by propulsive elements (by jets B63H 25/46); Steering or dynamic anchoring by propellers used therefor only; Steering or dynamic anchoring by rudders carrying propellers [2]

- 25/44 • Steering or slowing-down by extensible flaps or the like
- 25/46 • Steering or dynamic anchoring by jets [2]
- 25/48 • Steering or slowing-down by deflection of propeller slip-stream otherwise than by rudder
- 25/50 • Slowing-down means not otherwise provided for
- 25/52 • Parts for steering not otherwise provided for

## B63J AUXILIARIES ON VESSELS

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "auxiliaries" means only apparatus specially arranged for rendering vessels, in general, habitable or operative, in so far as such apparatus is not specifically provided for in another subclass of class B63.

**1/00 Arrangements of installations for producing fresh water, e.g. by evaporation and condensation of sea water**

**2/00 Arrangements of ventilation, heating, cooling, or air-conditioning** (for vehicles in general B60H; ventilating for cleaning tanks B63B 57/04; for underwater vessels, e.g. submarines, B63G 8/36)

2/02 • Ventilation; Air-conditioning

2/04 • • of living spaces

2/06 • • of engine rooms

2/08 • • of holds (heating or cooling of liquid-freight-carrying tanks B63J 2/14; arrangements for stowing frozen goods in vessels B63B 25/26)

2/10 • • Ventilating-shafts; Air-scoops (for port-holes B63B 19/04)

2/12 • Heating; Cooling

2/14 • • of liquid-freight-carrying tanks

**3/00 Driving of auxiliaries** (transmission elements per se F16)

3/02 • from propulsion power plant

3/04 • from power plant other than propulsion power plant

**4/00 Arrangements of installations for treating waste-water or sewage** (soil-water discharges B63B 29/16) [3]

**99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

## B64 AIRCRAFT; AVIATION; COSMONAUTICS

### B64B LIGHTER-THAN-AIR AIRCRAFT (ground installations for aircraft in general B64F)

**1/00 Lighter-than-air aircraft**

1/02 • Non-rigid airships (B64B 1/58 takes precedence; balloons B64B 1/40)

1/04 • • the profile being maintained by ties or cords connecting opposite surfaces

1/06 • Rigid airships; Semi-rigid airships (B64B 1/58 takes precedence)

1/08 • • Framework construction

1/10 • • Tail unit construction (B64B 1/12 takes precedence)

1/12 • • Movable control surfaces

1/14 • • Outer covering

1/16 • • • rigid

1/18 • • • Attachment to structure

1/20 • • provided with wings or stabilising surfaces

1/22 • • Arrangement of cabins or gondolas

1/24 • • Arrangement of propulsion plant (B64B 1/34 takes precedence)

1/26 • • • housed in ducts

1/28 • • • housed in nacelles

1/30 • • • Arrangement of propellers

1/32 • • • • surrounding hull

1/34 • • • • of lifting propellers

1/36 • • Arrangement of jet reaction apparatus for propulsion or directional control

1/38 • • Controlling position of centre of gravity

1/40 • Balloons (B64B 1/58 takes precedence; toy balloons A63H 27/10)

1/42 • • Construction or attachment of stabilising surfaces

1/44 • • adapted to maintain predetermined altitude

1/46 • • associated with apparatus to cause bursting

1/48 • • • to enable load to be dropped by parachute

1/50 • • Captive balloons

1/52 • • • attaching trailing entanglements

1/54 • • • connecting two or more balloons in superimposed relationship

1/56 • • • stabilised by rotary motion

1/58 • Arrangements or construction of gas-bags; Filling arrangements (connection of valves to inflatable elastic bodies B60C 29/00)

1/60 • • Gas-bags surrounded by separate containers of inert gas

1/62 • • Controlling gas pressure, heating, cooling, or discharging gas

1/64 • • Gas-valve operating mechanisms

1/66 • Mooring attachments (mooring masts B64F 1/14)

1/68 • Water flotation gear

1/70 • Ballasting arrangements

**Note(s)**

As far as possible, classification is made according to constructional features; classification according to particular kinds of aircraft is normally regarded as being of secondary importance, except in cases where this is considered to be the characteristic feature.

**Subclass index**

## STRUCTURES, FAIRINGS

Features common to different elements.....	1/00
Fuselages; wings; stabilising surfaces.....	1/00, 3/00, 5/00
Other structural elements.....	7/00

## PROPELLERS, FLIGHT CONTROL

Propellers.....	11/00
Adjustable control surfaces or members; control systems.....	9/00, 13/00
Control by jet reaction.....	15/00
Stabilisation and controls not otherwise provided for.....	17/00, 19/00

## MODIFYING LIFT BY ACTION ON AIR-FLOW.....13/00, 21/00, 23/00

## ALIGHTING GEAR.....25/00

## AIRCRAFT KINDS AND THEIR COMPONENTS NOT OTHERWISE PROVIDED FOR

Supersonic.....	30/00
Seaplanes.....	35/00
Aircraft intended to be sustained without power plant; powered hand-glider-type aircraft; microlight aircraft.....	31/00
Convertible aircraft.....	37/00
Vertical-take-off or landing aircraft.....	29/00
Rotorcraft; ornithopters.....	27/00, 33/00
Others.....	39/00

**Aircraft structures or fairings**

**1/00 Fuselages; Constructional features common to fuselages, wings, stabilising surfaces, or the like**  
(aerodynamical features common to fuselages, wings, stabilising surfaces, or the like B64C 23/00; flight-deck installations B64D)

- 1/06 • Frames; Stringers; Longerons
- 1/08 • • Geodetic or other open-frame structures
- 1/10 • • Bulkheads
- 1/12 • • Construction or attachment of skin panels
- 1/14 • Windows; Doors; Hatch covers or access panels; Surrounding frame structures; Canopies; Windscreens (fairings movable in conjunction with undercarriage elements B64C 25/16; bomb doors B64D 1/06)
- 1/16 • specially adapted for mounting power plant
- 1/18 • Floors
- 1/20 • • specially adapted for freight
- 1/22 • Other structures integral with fuselages to facilitate loading
- 1/24 • Steps mounted on, and retractable within, fuselages (readily removable B64D 9/00)
- 1/26 • Attaching the wing or tail units or stabilising surfaces
- 1/28 • Parts of fuselage relatively movable to improve pilots view
- 1/30 • Parts of fuselage relatively movable to reduce overall dimensions of aircraft
- 1/32 • Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats B64D 25/10)
- 1/34 • comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)

- 1/36 • adapted to receive aerals or radomes (aerals or radomes *per se* H01Q)

- 1/38 • Constructions adapted to reduce effects of aerodynamic or other external heating

- 1/40 • Sound or heat insulation

**3/00 Wings (stabilising surfaces B64C 5/00; ornithopter wings B64C 33/02)**

- 3/10 • Shape of wings
- 3/14 • • Aerofoil profile
- 3/16 • • Frontal aspect
- 3/18 • Spars; Ribs; Stringers (attaching wing unit to fuselage B64C 1/26)
- 3/20 • Integral or sandwich constructions (layered products or sandwich constructions in general B32B)
- 3/22 • Geodetic or other open-frame structures
- 3/24 • Moulded or cast structures
- 3/26 • Construction, shape, or attachment of separate skins, e.g. panels
- 3/28 • Leading or trailing edges attached to primary structures, e.g. forming fixed slots
- 3/30 • comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)
- 3/32 • specially adapted for mounting power plant
- 3/34 • Integrally-constructed tanks, e.g. for fuel (other aircraft fuel tanks or fuel systems B64D)
- 3/36 • Structures adapted to reduce effects of aerodynamic or other external heating
- 3/38 • Adjustment of complete wings or parts thereof
- 3/40 • • Varying angle of sweep
- 3/42 • • Adjusting about chordwise axes
- 3/44 • • Varying camber

3/46	• • •	by inflatable elements (connection of valves to inflatable elastic bodies B60C 29/00)	11/08	• • •	for non-adjustable blades
3/48	• • •	by relatively-movable parts of wing structures	11/10	• • • •	rigid
3/50	• • •	by leading or trailing edge flaps (ailerons B64C 9/00)	11/12	• • • •	flexible
3/52	• •	Warping	11/14	• •	Spinners
3/54	• •	Varying in area (flaps extendable to increase camber B64C 3/44)	11/16	•	Blades
3/56	• •	Folding or collapsing to reduce overall dimensions of aircraft	11/18	• •	Aerodynamic features
3/58	•	provided with fences or spoilers (adjustable for control purposes B64C 9/00)	11/20	• •	Constructional features
<b>5/00</b>		<b>Stabilising surfaces</b> (attaching stabilising surfaces to fuselage B64C 1/26)	11/22	• • •	Solid blades
5/02	•	Tailplanes (fins B64C 5/06)	11/24	• • •	Hollow blades
5/04	•	Noseplanes	11/26	• • •	Fabricated blades
5/06	•	Fins (specially for wings B64C 5/08)	11/28	• • •	Collapsible or foldable blades
5/08	•	mounted on, or supported by, wings	11/30	•	Blade pitch-changing mechanisms
5/10	•	adjustable	11/32	• •	mechanical
5/12	• •	for retraction against or within fuselage or nacelle	11/34	• • •	automatic
5/14	• •	Varying angle of sweep	11/36	• • •	non-automatic
5/16	• •	about spanwise axes	11/38	• •	fluid, e.g. hydraulic
5/18	• •	in area	11/40	• • •	automatic
<b>7/00</b>		<b>Structures or fairings not otherwise provided for</b>	11/42	• • •	non-automatic
7/02	•	Nacelles	11/44	• •	electric
			11/46	•	Arrangements of, or constructional features peculiar to, multiple propellers
			11/48	• •	Units of two or more coaxial propellers
			11/50	• •	Phase synchronisation between multiple propellers
<b>9/00</b>		<b>Adjustable control surfaces or members, e.g. rudders</b> (trimming stabilising surfaces B64C 5/10; systems for actuating flying-control surfaces B64C 13/00)	<b>13/00</b>		<b>Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers</b>
9/02	•	Mounting or supporting thereof	13/02	•	Initiating means
9/04	•	with compound dependent movements	13/04	• •	actuated personally
9/06	•	with two or more independent movements	13/06	• • •	adjustable to suit individual persons
9/08	•	bodily displaceable (varying camber of wings B64C 3/44)	13/08	• • •	Trimming zero positions
9/10	•	one surface adjusted by movement of another, e.g. servo tabs (B64C 9/04 takes precedence; adjusting surfaces of different type or function B64C 9/12)	13/10	• • •	comprising warning devices
9/12	•	surfaces of different type or function being simultaneously adjusted	13/12	• • •	Dual control apparatus
9/14	•	forming slots (boundary-layer control B64C 21/00)	13/14	• • •	lockable (locking in position to suit individual persons B64C 13/06)
9/16	• •	at the rear of the wing	13/16	• •	actuated automatically, e.g. responsive to gust detectors
9/18	• • •	by single flaps	13/18	• • •	using automatic pilot (automatic pilots <u>per se</u> G05D 1/00)
9/20	• • •	by multiple flaps	13/20	• • •	using radiated signals
9/22	• •	at the front of the wing	13/22	• • •	readily revertible to personal control
9/24	• • •	by single flap	13/24	•	Transmitting means
9/26	• • •	by multiple flaps	13/26	• •	without power amplification or where power amplification is irrelevant
9/28	• •	by flaps at both the front and rear of the wing operating in unison	13/28	• • •	mechanical
9/30	•	Balancing hinged surfaces, e.g. dynamically	13/30	• • • •	using cable, chain, or rod mechanisms
9/32	•	Air braking surfaces (braking by parachutes B64D 17/80)	13/32	• • • •	using cam mechanisms
9/34	•	collapsing or retracting against or within other surfaces or other members	13/34	• • • •	using toothed gearing
9/36	• •	the members being fuselages or nacelles	13/36	• • •	fluid
9/38	•	Jet flaps	13/38	• •	with power amplification
<b>11/00</b>		<b>Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft</b> (rotors specially adapted for rotorcraft B64C 27/32)	13/40	• • •	using fluid pressure
11/02	•	Hub construction	13/42	• • • •	having duplication or stand-by provisions
11/04	• •	Blade mountings	13/44	• • • •	overriding of personal controls; with automatic return to inoperative position
11/06	• • •	for variable-pitch blades	13/46	• • • •	with artificial feel
			13/48	• • • •	characterised by the fluid being gaseous
			13/50	• • •	using electrical energy
			<b>15/00</b>		<b>Attitude, flight direction, or altitude control by jet reaction</b> (details of jet-engine plants, e.g. of nozzles or jet pipes, F02K) [3]
			15/02	•	the jets being propulsion jets
			15/12	• •	the power plant being tiltable
			15/14	•	the jets being other than main propulsion jets (jet flaps B64C 9/38)

**17/00 Aircraft stabilisation not otherwise provided for**

- 17/02 • by gravity or inertia-actuated apparatus
- 17/04 • • by pendular bodies
- 17/06 • • by gyroscopic apparatus (automatic-pilot control B64C 13/18)
- 17/08 • by ballast supply or discharge (for lighter-than-air aircraft B64B)
- 17/10 • Transferring fuel to adjust trim

**19/00 Aircraft control not otherwise provided for**

- 19/02 • Conjoint controls

**Influencing air-flow over aircraft surfaces, not otherwise provided for****21/00 Influencing air-flow over aircraft surfaces by affecting boundary-layer flow** (boundary-layer control in general F15D)

- 21/02 • by use of slot, ducts, porous areas, or the like
- 21/04 • • for blowing (B64C 21/08 takes precedence)
- 21/06 • • for sucking (B64C 21/08 takes precedence)
- 21/08 • • adjustable
- 21/10 • using other surface properties, e.g. roughness

**23/00 Influencing air-flow over aircraft surfaces, not otherwise provided for**

- 23/02 • by means of rotating members of cylindrical or similar form
- 23/04 • by generating shock waves
- 23/06 • by generating vortices
- 23/08 • using Magnus effect

**25/00 Alighting gear** (air-cushion alighting gear B60V 3/08)

- 25/02 • Undercarriages
- 25/04 • • Arrangement or disposition on aircraft
- 25/06 • • fixed
- 25/08 • • non-fixed, e.g. jettisonable
- 25/10 • • • retractable, foldable, or the like
- 25/12 • • • • sideways
- 25/14 • • • • fore-and-aft
- 25/16 • • • • Fairings movable in conjunction with undercarriage elements
- 25/18 • • • • Operating mechanisms
- 25/20 • • • • • mechanical
- 25/22 • • • • • fluid
- 25/24 • • • • • electric
- 25/26 • • • • • Control or locking systems therefor
- 25/28 • • • • • with indicating or warning devices
- 25/30 • • • • • emergency actuated
- 25/32 • characterised by elements which contact the ground or similar surface (arrestor hooks B64C 25/68)
- 25/34 • • wheeled type, e.g. multi-wheeled bogies
- 25/36 • • • Arrangements or adaptations of wheels, tyres, or axles in general (construction of wheels or axles B60B; construction of tyres in general B60C)
- 25/38 • • endless-track type
- 25/40 • • the elements being rotated before touch-down
- 25/42 • • Arrangement or adaptation of brakes (the ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear, B60T 8/32) [4]

- 25/44 • • • Actuating mechanisms
- 25/46 • • • • Brake regulators for preventing skidding or aircraft somersaulting
- 25/48 • • • • differentially operated for steering purposes
- 25/50 • • Steerable undercarriages; Shimmy-damping (steering devices applicable to land vehicles B62D)
- 25/52 • • Skis or runners
- 25/54 • • Floats
- 25/56 • • • inflatable (connection of valves to inflatable elastic bodies B60C 29/00)
- 25/58 • • Arrangements or adaptations of shock-absorbers or springs (shimmy-dampers B64C 25/50; vehicle suspension arrangements in general B60G; shock-absorbers per se F16F)
- 25/60 • • • Oleo legs
- 25/62 • • • Spring shock-absorbers; Springs
- 25/64 • • • • using rubber or like elements
- 25/66 • • Convertible alighting gear; Combinations of different kinds of ground or like engaging elements
- 25/68 • Arrestor hooks (arresting gear, e.g. on aircraft carriers, B64F)

**Aircraft kinds or components not otherwise provided for****27/00 Rotorcraft; Rotors peculiar thereto** (alighting gear B64C 25/00)

- 27/02 • Gyroplanes
- 27/04 • Helicopters
- 27/06 • • with single rotor
- 27/08 • • with two or more rotors
- 27/10 • • • arranged coaxially
- 27/12 • • Rotor drives
- 27/14 • • • Direct drive between power plant and rotor hub
- 27/16 • • • Drive of rotors by means, e.g. propellers, mounted on rotor blades
- 27/18 • • • • the means being jet-reaction apparatus
- 27/20 • Rotorcraft characterised by having shrouded rotors, e.g. flying platforms
- 27/22 • Compound rotorcraft, i.e. aircraft using in flight the features of both aeroplane and rotorcraft
- 27/24 • • with rotor blades fixed in flight to act as lifting surfaces
- 27/26 • • characterised by provision of fixed wings
- 27/28 • • with forward-propulsion propellers pivotable to act as lifting rotors
- 27/30 • • with provision for reducing drag of inoperative rotor
- 27/32 • Rotors (features common to rotors and propellers B64C 11/00)
- 27/33 • • having flexing arms [3]
- 27/35 • • having elastomeric joints [3]
- 27/37 • • having articulated joints (B64C 27/33, B64C 27/35 take precedence) [3]
- 27/39 • • • with individually articulated blades, i.e. with flapping or drag hinges [3]
- 27/41 • • • with flapping hinge or universal joint, common to the blades [3]
- 27/43 • • • • see-saw type, i.e. two-bladed rotor [3]
- 27/45 • • • with a feathering hinge only [3]
- 27/46 • • Blades
- 27/467 • • • Aerodynamic features [6]
- 27/473 • • • Constructional features [6]
- 27/48 • • • • Root attachment to rotor head

27/50	• • • • Blades foldable to facilitate stowage of aircraft	29/02	• having its flight directional axis vertical when grounded
27/51	• Damping of blade movements [3]	29/04	• • characterised by jet-reaction propulsion
27/52	• Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C 27/43)	<b>30/00</b>	<b>Supersonic type aircraft [3]</b>
27/54	• Mechanisms for controlling blade adjustment or movement relative to rotor head, e.g. lag-lead movement	<b>31/00</b>	<b>Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft</b>
27/56	• • characterised by the control initiating means, e.g. manually actuated (B64C 27/58 takes precedence)	31/02	• Gliders, e.g. sailplanes (hang-gliders B64C 31/028) [6]
27/57	• • • automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust [3]	31/024	• • with auxiliary power plant [6]
27/58	• • Transmitting means, e.g. interrelated with initiating means or means acting on blades (initiating means B64C 27/56; means acting on blades B64C 27/72)	31/028	• Hang-glider-type aircraft; Microlight-type aircraft [6]
27/59	• • • mechanical [3]	31/032	• • having delta shaped wing [6]
27/605	• • • • including swash plate, spider or cam mechanisms [3]	31/036	• • having parachute-type wing (parachutes B64D 17/00) [6]
27/615	• • • • including flaps mounted on blades [3]	31/04	• Man-powered aircraft (ornithopters B64C 33/00)
27/625	• • • • including rotating masses or servo rotors [3]	31/06	• Kites (hang-gliders B64C 31/028; toy aspects A63H 27/08; towed targets F41J)
27/635	• • • • specially for controlling lag-lead movements of blades [3]	<b>33/00</b>	<b>Ornithopters</b>
27/64	• • • using fluid pressure, e.g. having fluid power amplification [3]	33/02	• Wings; Actuating mechanisms therefor
27/68	• • • using electrical energy, e.g. having electrical power amplification [3]	<b>35/00</b>	<b>Flying-boats; Seaplanes</b> (alighting gear B64C 25/00)
27/72	• • Means acting on blades	35/02	• Flying-boat hulls [3]
27/78	• • in association with pitch adjustment of blades of anti-torque rotor	<b>37/00</b>	<b>Convertible aircraft</b> (vehicles capable of travelling in or on different media B60F)
27/80	• • for differential adjustment of blade pitch between two or more lifting rotors	37/02	• Flying units formed by separate aircraft (towing, air-refuelling, or aircraft-carrying aircraft B64D)
27/82	• characterised by the provision of an auxiliary rotor or fluid-jet device for counter-balancing lifting-rotor torque or changing direction of rotorcraft	<b>39/00</b>	<b>Aircraft not otherwise provided for</b>
<b>29/00</b>	<b>Aircraft capable of landing or taking-off vertically</b> (attitude, flight direction, or altitude control by jet reaction B64C 15/00; rotorcraft B64C 27/00; air-cushion vehicles B60V; details of jet-engine plants, e.g. of nozzles or jet pipes, F02K)	39/02	• characterised by special use
		39/04	• having multiple fuselages or tail booms [3]
		39/06	• having disc- or ring-shaped wings [3]
		39/08	• having multiple wings [3]
		39/10	• All-wing aircraft [3]
		39/12	• Canard-type aircraft [3]
		<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2010.01]</b>

## **B64D EQUIPMENT FOR FITTING IN OR TO AIRCRAFT; FLYING SUITS; PARACHUTES; ARRANGEMENTS OR MOUNTING OF POWER PLANTS OR PROPULSION TRANSMISSIONS**

### **Subclass index**

#### **FLIGHT ARRANGEMENTS ON AIRCRAFT**

Of power plant and auxiliaries.....	27/00, 29/00, 33/00, 41/00
Of power-plant controls and transmissions.....	31/00, 35/00
For fuel supply.....	37/00, 39/00
Of flying instruments.....	43/00

#### **USE OF AIRCRAFT**

For military purposes.....	1/00, 7/00
For persons or freight.....	9/00-13/00

#### **SAFETY OR EMERGENCY ARRANGEMENTS OR EQUIPMENTS**

For the aircraft	
against icing; against lightning.....	15/00, 45/02
for landing.....	17/80, 45/00
For jettisoning or other means concerning fuel.....	37/26, 37/32
For persons or material	
by holding or ejecting means.....	25/00
by parachutes; parachuting.....	17/00-21/00, 23/00
Other safety, emergency, or protection means.....	10/00, 25/00, 45/00

## EQUIPMENT FOR OPERATIONS PERFORMED DURING FLIGHT

Releasing or receiving articles, fluent materials, or another aircraft.....	1/00, 5/00
Towing, fuel replenishing.....	3/00, 39/00
OTHER ARRANGEMENTS OR EQUIPMENT.....	47/00

**1/00 Dropping, ejecting, releasing, or receiving articles, liquids, or the like, in flight** (with respect to weapon sights, F41G takes precedence; parachutes B64D 17/00; ejectable seats B64D 25/10; ejectable capsules B64D 25/12; refuelling during flight B64D 39/00; launching apparatus for projecting projectiles or missiles F41F 1/00, F41F 7/00; rocket or torpedo launchers F41F 3/00)

- 1/02 • Dropping, ejecting, or releasing articles (jettisonable fuel reservoirs B64D 37/12)
- 1/04 • • the articles being explosive, e.g. bombs (arming or setting bomb fuzes F42C)
- 1/06 • • • Bomb releasing; Bomb doors
- 1/08 • • the articles being load-carrying devices
- 1/10 • • • Stowage arrangements for the devices in aircraft
- 1/12 • • • Releasing
- 1/14 • • • Absorbing landing shocks
- 1/16 • Dropping or releasing powdered, liquid or gaseous matter, e.g. for fire-fighting (jettisoning fuel B64D 37/26) [5]
- 1/18 • • by spraying, e.g. insecticides (spraying apparatus in general B05B)
- 1/20 • • for sky-writing
- 1/22 • Taking-up articles from earth's surface

**3/00 Aircraft adaptations to facilitate towing or being towed** (B64D 39/00 takes precedence; ground installations for launching or towing aircraft B64F; towing ropes per se D07B)

- 3/02 • for towing targets (towed targets per se F41J)

**5/00 Aircraft transported by aircraft, e.g. for release or reberthing during flight** (flying units formed by separate aircraft B64C 37/02)

**7/00 Arrangement of military equipment, e.g. armaments, armament accessories, or military shielding, in aircraft; Adaptations of armament mountings for aircraft** (dropping bombs or the like B64D 1/00; armaments or mountings therefor per se F41)

- 7/02 • the armaments being firearms
- 7/04 • • fixedly mounted
- 7/06 • • movably mounted
- 7/08 • Arrangement of rocket launchers (rocket launchers per se, e.g. rocket pods, F41F 3/06)

**9/00 Equipment for handling freight; Equipment for facilitating passenger embarkation or the like** (emergency equipment B64D 17/00, B64D 19/00, B64D 25/00; structures integral with fuselage to facilitate loading, fuselage floors specially adapted for freight, steps mounted on, and retractable within, aircraft B64C; ground installations B64F)

**10/00 Flying suits** (helmets in general A42B 3/00; breathing helmets A62B 18/00) [3]

**11/00 Passenger or crew accommodation; Flight-deck installations not otherwise provided for**

- 11/02 • Toilet fittings (of general application A47K)
- 11/04 • Galleys

- 11/06 • Arrangements or adaptations of seats (seat constructions for emergency purposes B64D 25/04)

**13/00 Arrangements or adaptations of air-treatment apparatus for aircraft crew or passengers, or freight space** (treatment rooms with artificial climate for medical purposes A61G 10/02; respiratory apparatus in general A62B; for vehicles in general B60H)

- 13/02 • the air being pressurised
- 13/04 • • Automatic control of pressure
- 13/06 • the air being conditioned (pressurising B64D 13/02)
- 13/08 • • the air being heated or cooled

**15/00 De-icing or preventing icing on exterior surfaces of aircraft** (motor vehicles specially adapted for carrying de-icing equipment B60P)

- 15/02 • by ducted hot gas or liquid
- 15/04 • • Hot gas application
- 15/06 • • Liquid application (in general B05)
- 15/08 • • • exuded from surface
- 15/10 • • • sprayed over surface
- 15/12 • by electric heating (H05B 3/84 takes precedence; electric heating elements in general H05B) [5]
- 15/14 • • controlled cyclically along length of surface
- 15/16 • by mechanical means, e.g. pulsating mats or shoes attached to, or built into, surface
- 15/18 • • the surface being an aerofoil, rotor, or propeller
- 15/20 • Means for detecting icing or initiating de-icing
- 15/22 • • Automatic initiation by icing detector

**17/00 Parachutes** (non-canopied parachutes B64D 19/00)

- 17/02 • Canopy arrangement or construction
- 17/04 • • formed with two or more canopies arranged about a common axis
- 17/06 • • formed with two or more canopies arranged in a cluster
- 17/08 • • Secondary or shock-absorbing canopies attached to load line
- 17/10 • • Ribbon construction or the like
- 17/12 • • constructed to provide variable or non-uniform porosity over area of canopy
- 17/14 • • with skirt or air-deflecting panels
- 17/16 • • • secured to hem of main canopy
- 17/18 • • Vent arrangement or construction
- 17/20 • • • variable in area
- 17/22 • Load suspension
- 17/24 • • Rigging lines
- 17/26 • • • attached to hem of canopy
- 17/28 • • • attached to apex of canopy
- 17/30 • • Harnesses [4]
- 17/32 • • • Construction of quick-release box
- 17/34 • • adapted to control direction or rate of descent
- 17/36 • • incorporating friction devices or frangible connections to reduce shock loading of canopy
- 17/38 • • Releasable fastening devices between parachute and load or pack
- 17/40 • Packs
- 17/42 • • rigid
- 17/44 • • • forming part of load

- 17/46 • • Closing means
- 17/48 • • with separate pack for extractor of auxiliary parachute
- 17/50 • • formed with separate compartments for main canopy, rigging lines, or auxiliary parachute
- 17/52 • • Opening, e.g. manual
- 17/54 • • • automatic
- 17/56 • • • • responsive to barometric pressure
- 17/58 • • • • responsive to time-delay mechanism
- 17/60 • • • • by static line
- 17/62 • Deployment
- 17/64 • • by extractor parachute
- 17/66 • • • attached to hem of main canopy
- 17/68 • • • attached to apex of main canopy
- 17/70 • • by springs
- 17/72 • • by explosive or inflatable means (connection of valves to inflatable elastic bodies B60C 29/00)
- 17/74 • • Sequential deployment of a plurality of canopies
- 17/76 • • facilitated by method of folding or packing
- 17/78 • • in association with other load-retarding apparatus
- 17/80 • • in association with aircraft, e.g. for braking thereof
  
- 19/00 Non-canopied parachutes**
- 19/02 • Rotary-wing parachutes
  
- 21/00 Testing of parachutes**
  
- 23/00 Training of parachutists**
  
- 25/00 Emergency apparatus or devices, not otherwise provided for** (parachutes B64D 17/00, B64D 19/00; jettisoning of fuel tanks or fuel B64D 37/00; safety belts or body harnesses in general A62B 35/00; safety belts or body harnesses for land vehicles B60R 22/00; severable or jettisonable parts of fuselage facilitating emergency escape B64C) [4]
- 25/02 • Supports or holding means for living bodies (for ejector seats B64D 25/115) [5]
- 25/04 • • Seat modifications
- 25/06 • • Harnessing [4]
- 25/08 • Ejecting or escaping means (escape apertures B64C)
- 25/10 • • Ejector seats
- 25/102 • • • Propelling means, e.g. by a combination of catapult and rocket means (B64D 25/11, B64D 25/112 take precedence) [5]
- 25/105 • • • • by catapult means only [5]
- 25/108 • • • • by rocket means only [5]
- 25/11 • • • Controlling attitude or direction of ejector seat or associated mechanism prior to ejection [5]
- 25/112 • • • Controlling attitude or direction of ejector seat after ejection [5]
- 25/115 • • • Occupant restraining, positioning or protecting devices [5]
- 25/118 • • • Separation of occupant from seat after ejection [5]
- 25/12 • • Ejectable capsules
- 25/14 • • Inflatable escape chutes (connection of valves to inflatable elastic bodies B60C 29/00)
- 25/16 • • Dinghy stowage
- 25/18 • • Flotation gear (aircraft alighting gear B64C)
- 25/20 • • Releasing of crash-position indicators
  
- 27/00 Arrangement or mounting of power plant in aircraft; Aircraft characterised thereby** (attitude, flight-direction, or altitude control of aircraft by jet reaction B64C)
- 27/02 • Aircraft characterised by the type or position of power plant (fuselages or wings adapted for mounting power plant B64C)
- 27/04 • • of piston type
- 27/06 • • • within, or attached to, wing
- 27/08 • • • within, or attached to, fuselage
- 27/10 • • of gas-turbine type (B64D 27/16 takes precedence)
- 27/12 • • • within, or attached to, wing
- 27/14 • • • within, or attached to, fuselage
- 27/16 • • of jet type
- 27/18 • • • within, or attached to, wing
- 27/20 • • • within, or attached to, fuselage
- 27/22 • • using atomic energy
- 27/24 • • using steam, electricity, or spring force (B64D 27/16 takes precedence)
- 27/26 • Aircraft characterised by construction of power-plant mounting
  
- 29/00 Power-plant nacelles, fairings, or cowlings** (nacelles not otherwise provided for B64C)
- 29/02 • associated with wings (wings adapted for mounting power plant B64C)
- 29/04 • associated with fuselages
- 29/06 • Attaching of nacelles, fairings, or cowlings
- 29/08 • Inspection panels for power plants
  
- 31/00 Power plant control; Arrangement thereof** (flying controls, conjoint control of power plant and propeller B64C)
- 31/02 • Initiating means
- 31/04 • • actuated personally
- 31/06 • • actuated automatically
- 31/08 • • • for keeping cruising speed constant
- 31/10 • • • for preventing asymmetric thrust upon failure of one power plant
- 31/12 • • • for equalising or synchronising power plants
- 31/14 • Transmitting means between initiating means and power plants
  
- 33/00 Arrangement in aircraft of power plant parts or auxiliaries not otherwise provided for**
- 33/02 • of combustion air intakes (air intakes for gas-turbine plants or jet-propulsion plants per se F02C 7/04; air intakes for combustion engines in general F02M 35/00)
- 33/04 • of exhaust outlets or jet pipes (exhaust outlets for combustion engines in general F01N; jet pipes or nozzles for jet-propulsion plants per se F02K; plants characterised by the form or arrangement of the jet pipe or nozzle F02K) [3]
- 33/08 • of power plant cooling systems (cooling of internal-combustion engines per se F01P; cooling of gas-turbine plants or jet-propulsion plants per se F02C, F02K)
- 33/10 • • Radiator arrangement
- 33/12 • • • of retractable type
  
- 35/00 Transmitting power from power plant to propellers or rotors; Arrangements of transmissions** (propellers or rotors per se, helicopter transmissions B64C)
- 35/02 • characterised by the type of power plant
- 35/04 • characterised by the transmission driving a plurality of propellers or rotors
- 35/06 • • the propellers or rotors being counter-rotating
- 35/08 • characterised by the transmission being driven by a plurality of power plants

## B64D

- 37/00 Arrangements in connection with fuel supply for power plant** (refuelling during flight B64D 39/00)
- 37/02 • Tanks (tanks constructed integrally with aircraft wings B64C; tanks in general B65D)
- 37/04 • • Arrangement thereof in or on aircraft
- 37/06 • • Constructional adaptations thereof
- 37/08 • • • Internal partitioning
- 37/10 • • • to facilitate fuel pressurisation
- 37/12 • • • jettisonable
- 37/14 • • Filling or emptying (transferring fuels to adjust aircraft trim B64C)
- 37/16 • • • Filling systems (ground installations for fuelling aircraft B64F)
- 37/18 • • • • Conditioning fuel during filling
- 37/20 • • • Emptying systems
- 37/22 • • • • facilitating emptying in any position of tank
- 37/24 • • • • using gas pressure
- 37/26 • • • • Jettisoning of fuel
- 37/28 • • • • Control thereof
- 37/30 • Fuel systems for specific fuels
- 37/32 • Safety measures not otherwise provided for, e.g. preventing explosive conditions (extinguishing or preventing fires in aircraft A62C)
- 37/34 • Conditioning fuel, e.g. heating (during filling B64D 37/18)
- 39/00 Refuelling during flight** (filling or emptying fuel tanks B64D 37/14)
- 39/02 • Means for paying-in or out hose

- 39/04 • Adaptations of hose construction (pipes in general F16L)
- 39/06 • Connecting hose to aircraft; Disconnecting hose therefrom
- 41/00 Power installations for auxiliary purposes**
- 43/00 Arrangements or adaptations of instruments** (arrangements of cameras B64D 47/08; aeronautical measuring instruments *per se* G01C)
- 43/02 • for indicating aircraft speed or stalling conditions
- 45/00 Aircraft indicators or protectors not otherwise provided for** (camouflage F41H 3/00)
- 45/02 • Lightning protectors (lightning arrestors H01C 7/12, H01C 8/04, H01G 9/18, H01T; circuit arrangements therefor H02H); Static dischargers (in general H05F 3/00)
- 45/04 • Landing aids; Safety measures to prevent collision with earth's surface
- 45/06 • • mechanical
- 45/08 • • optical
- 47/00 Equipment not otherwise provided for**
- 47/02 • Arrangements or adaptations of signal or lighting devices
- 47/04 • • the lighting devices being primarily intended to illuminate the way ahead
- 47/06 • • for indicating aircraft presence
- 47/08 • Arrangements of cameras

## B64F GROUND OR AIRCRAFT-CARRIER-DECK INSTALLATIONS

### Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "installations" embraces equipment, including mobile equipment, peculiar to use in connection with aircraft and not fitted thereto;
- "ground installations" embraces waterborne installations.

- 1/00 Ground or aircraft-carrier-deck installations** (specially adapted for captive aircraft B64F 3/00; aircraft-carriers B63; fog-dispersal installations E01H; wind tunnels G01M; grounded flight trainers G09B)
- 1/02 • Arresting gear; Liquid barriers
- 1/04 • Launching or towing gear (railway aspects B61; aircraft towing aircraft B64D 3/00; ammunition launching gear F41F)
- 1/06 • • using catapults
- 1/08 • • using winches
- 1/10 • • using self-propelled vehicles
- 1/12 • Anchoring
- 1/14 • • Towers or masts for mooring airships or balloons (mooring attachments of lighter-than-air aircraft B64B 1/66; building aspects E04H 6/00, E04H 12/00)
- 1/16 • • Pickets or ground anchors; Wheel chocks
- 1/18 • Visual or acoustic landing aids (optical or acoustic signalling in general G08)
- 1/20 • • Arrangement of optical beacons
- 1/22 • installed for handling aircraft
- 1/24 • • Adaptations of turntables
- 1/26 • for reducing engine or jet noise; Protecting airports from jet erosion
- 1/28 • Liquid-handling installations specially adapted for fuelling stationary aircraft (liquid handling in general B67)
- 1/30 • for embarking or disembarking passengers
- 1/305 • • Bridges extending between terminal building and aircraft, e.g. telescopic, vertically adjustable [3]
- 1/31 • • Passenger vehicles specially adapted to co-operate, e.g. dock, with aircraft or terminal buildings [3]
- 1/315 • • Mobile stairs (movable stairways in general E04F 11/04) [3]
- 1/32 • for handling freight
- 1/34 • for starting propulsion plant
- 1/36 • Other airport installations (construction of, or surfacing for, airfields E01C)
- 3/00 Ground installations specially adapted for captive aircraft** (railway aspects B61)
- 3/02 • with means for supplying electricity to aircraft during flight
- 5/00 Designing, manufacturing, assembling, cleaning, maintaining, or repairing aircraft, not otherwise provided for**



**B64G COSMONAUTICS; VEHICLES OR EQUIPMENT THEREFOR** (apparatus for, or methods of, winning materials from extraterrestrial sources E21C 51/00)

### Note(s)

1. This subclass covers only vehicles, equipment or the like, which are specially adapted for cosmonautics.
2. This subclass does not cover vehicles and equipment applicable to both cosmonautics and aeronautics, which are covered by the appropriate aeronautical subclasses of class B64.
3. In this subclass, the following term is used with the meaning indicated:
  - "cosmonautics" includes all transport outside the earth's atmosphere, and thus includes artificial earth satellites, and interplanetary and interstellar travel.

#### 1/00 Cosmonautic vehicles [3]

- 1/10 • Artificial satellites; Systems of such satellites; Interplanetary vehicles (space shuttles B64G 1/14; radio transmission systems using satellites H04B 7/185)
- 1/12 • • manned [3]
- 1/14 • Space shuttles [3]
- 1/16 • Extraterrestrial cars (land vehicle aspects B60-B62) [3]
- 1/22 • Parts of, or equipment specially adapted for fitting in or to, cosmonautic vehicles [3]
- 1/24 • • Guiding or controlling apparatus, e.g. for attitude control (jet-propulsion plants F02K; navigation or navigational instruments, see the relevant subclasses, e.g. G01C; automatic pilots G05D 1/00) [3]
- 1/26 • • • using jets [3]
- 1/28 • • • using inertia or gyro effect [3]
- 1/32 • • • using earth's magnetic field [3]
- 1/34 • • • using gravity gradient [3]
- 1/36 • • • using sensors, e.g. sun-sensors, horizon sensors [3]
- 1/38 • • • damping of oscillations, e.g. nutation dampers [3]
- 1/40 • • Arrangements or adaptations of propulsion systems (B64G 1/26 takes precedence; propulsion plants per se, see the relevant subclasses, e.g. F02K, F03H) [3]
- 1/42 • • Arrangements or adaptations of power supply systems (power supply systems per se, see the relevant subclasses) [3]
- 1/44 • • • using radiation, e.g. deployable solar arrays (solar cells per se H01L 31/00) [3]
- 1/46 • • Arrangements or adaptations of devices for control of environment or living conditions (space suits B64G 6/00) [3]
- 1/48 • • • for treatment of the atmosphere (B64G 1/50 takes precedence; air conditioning in general F24F) [3]

- 1/50 • • • for temperature control (temperature control in general G05D 23/00) [3]
- 1/52 • • Protection, safety or emergency devices; Survival aids (life-saving in general A62) [3]
- 1/54 • • • Protection against radiation (against radiation in general G21F) [3]
- 1/56 • • • Protection against meteorites (meteorite detectors B64G 1/68) [3]
- 1/58 • • • Thermal protection, e.g. heat shields (thermal insulation in general F16L 59/00; chemical aspects, see the relevant classes) [3]
- 1/60 • • Crew or passenger accommodations [3]
- 1/62 • • Systems for re-entry into the earth's atmosphere; Retarding or landing devices [3]
- 1/64 • • Systems for coupling or separating cosmonautic vehicles or parts thereof, e.g. docking arrangements [3]
- 1/66 • • Arrangements or adaptations of apparatus or instruments, not otherwise provided for (instruments per se, see the relevant classes, e.g. aerials for use in satellites H01Q 1/28) [3]
- 1/68 • • • of meteorite detectors [3]

**3/00 Observing or tracking cosmonautic vehicles** (radio or other waves systems for navigation or tracking G01S)

**4/00 Tools specially adapted for use in space [3]**

**5/00 Ground equipment for vehicles, e.g. starting towers, fuelling arrangements** (B64G 3/00 takes precedence)

**6/00 Space suits [3]**

**7/00 Simulating cosmonautic conditions, e.g. for conditioning crews** (simulators for teaching or training purposes G09B 9/00)

**99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

**B65 CONVEYING; PACKING; STORING; HANDLING THIN OR FILAMENTARY MATERIAL**

**B65B MACHINES, APPARATUS OR DEVICES FOR, OR METHODS OF, PACKAGING ARTICLES OR MATERIALS; UNPACKING** (bundling and pressing devices for cigars A24C 1/44; paper-bag holders as shop or office accessories A47F 13/08; apparatus for coating, e.g. by dipping, B05C; devices for tensioning and securing binders adapted to be supported by the article or articles to be bound B25B; nailing or stapling devices B25C, B27F; inserting documents in envelopes and closing the latter B43M 3/00, B43M 5/00; labelling B65C; wrappers, containers or other packaging elements, e.g. binders, closures, protective caps, B65D; transport or storage devices B65G; devices for handling sheets or webs of interest apart from their application in packaging machines B65H; applying closure members to bottles, jars or similar containers B67B; hand- or power-operated devices not attached to, or not incorporated in, containers or container closures for opening closed containers B67B 7/00; packaging of matches C06F; wrapping sugar during manufacture C13B 45/02; packaging of ammunition or explosive charges F42B 39/00; making containers or receptacles, see the appropriate subclasses)

**Note(s)**

1. This subclass does not cover:
  - operations of the types mentioned in Note (2) (a) to (f), employed in the manufacture of articles other than packages, which are covered by other appropriate subclasses, e.g. making confectionery products by casting in moulds formed by wrappers A23G, filling ammunition, e.g. cartridges, F42B 33/02;
  - methods of packaging, which are wholly characterised by the form of the package produced, or the form of the container or packaging-element used, which are covered by B65D.
2. In this subclass, the following terms are used with the meanings indicated:
  - "packaging" includes mainly the following operations:
    - a. filling portable containers or receptacles with materials or small articles to form packages;
    - b. inserting articles or groups of articles into containers or receptacles;
    - c. closing filled containers or receptacles otherwise than by metal-, glass-, or wood-working operations;
    - d. enclosing, or partially enclosing, articles or quantities of material, in sheets, strips, blanks, webs, or tubes of thin flexible material, e.g. wrapping;
    - e. bundling articles, e.g. holding articles together in groups by applying string or wire;
    - f. attaching articles to cards, sheets, or webs.
  - "package" means the end product of a packaging operation, e.g. a filled and closed container, an article enclosed in a wrapper, a group of articles held together by string or wire, a crate of bottles.
  - "materials" includes matter, or masses of articles, which are to be packaged, as distinct from separate or individual articles.

**Subclass index****METHODS AND APPARATUS FOR PACKAGING**

## Of general application

in individual receptacles: for materials; for objects; closing after filling.....1/00, 3/00, 5/00, 7/00  
 enclosing successively in webs; wrapping; by attachment to carriers.....9/00, 11/00, 15/00  
 for objects: bundling; joining.....13/00, 17/02  
 other processes and apparatus.....17/00

## For particular objects or materials; under particular conditions

for fragile rod-shaped or tubular objects; for bottles; for other articles presenting special problems....19/00, 21/00, 23/00, 25/00  
 bundling particular articles.....27/00  
 using removable coatings.....33/00  
 for particular materials: fibrous; other.....27/00, 29/00  
 under particular atmospheric or gaseous conditions.....31/00

**DETAILS OF APPARATUS AND AUXILIARY DEVICES OR OPERATIONS, NOT OTHERWISE****PROVIDED FOR**

## Relating to contents

supply arrangements; introducing into containers or wrappers; preservation, purification.....35/00, 37/00, 39/00, 55/00  
 other devices or methods.....63/00

## Relating to containers

supplying container-forming material; forming containers; forming pockets; holding wrappers  
 during wrapping.....41/00, 43/00, 47/00, 45/00  
 bending wrappers round contents; shrinking; closing; preserving, purifying.....49/00, 53/00, 51/00, 55/00  
 other devices or methods.....61/00

## Relating to apparatus: control, safety; adaptation to different requirements; other details.....57/00, 59/00, 65/00

**PACKAGING BY HAND**.....67/00

**UNPACKING NOT OTHERWISE PROVIDED FOR**.....69/00

**Machines, apparatus, or methods of general application for packaging articles or materials**

- 1/00 Packaging fluent solid material, e.g. powders, granular or loose fibrous material, loose masses of small articles, in individual containers or receptacles, e.g. bags, sacks, boxes, cartons, cans, jars** (under special atmospheric or gaseous conditions B65B 31/00)
- 1/02 • Machines characterised by the incorporation of means for making the containers or receptacles (from flat, folded, or tubular webs of flexible sheet material B65B 9/00; making containers or receptacles of interest apart from this application, see the appropriate subclasses)
- 1/04 • Methods of, or means for, filling the material into the containers or receptacles
- 1/06 • • by gravity flow
- 1/08 • • by vibratory feeders
- 1/10 • • by rotary feeders
- 1/12 • • • of screw type
- 1/14 • • • of centrifugal type
- 1/16 • • by pneumatic means, e.g. by suction
- 1/18 • • for filling valve-bags
- 1/20 • Reducing volume of filled material
- 1/22 • • by vibration
- 1/24 • • by mechanical compression
- 1/26 • • by pneumatic means, e.g. suction
- 1/28 • Controlling escape of air or dust from containers or receptacles during filling (cleaning of, or removing dust from, containers, wrappers, or packages B65B 55/24)
- 1/30 • Devices or methods for controlling or determining the quantity or quality of the material fed or filled
- 1/32 • • by weighing (check-weighing of filled containers or receptacles B65B 1/46; weighing in general G01G)
- 1/34 • • • Adjusting weight by trickle feed
- 1/36 • • by volumetric devices or methods (checking volume of filled material B65B 1/48; volumetric measurement in general G01F)
- 1/38 • • • by pistons co-operating with measuring chambers
- 1/40 • • by timing of filling operations
- 1/42 • • • and arresting flow by cut-off means
- 1/44 • • Checking density of material to be filled
- 1/46 • • Check-weighing of filled containers or receptacles (check-weighing in general G01G)
- 1/48 • • Checking volume of filled material
- 3/00 Packaging plastic material, semiliquids, liquids, or mixed solids and liquids, in individual containers or receptacles, e.g. bags, sacks, boxes, cartons, cans, jars** (packaging under special atmospheric or gaseous conditions, adding propellants to aerosol containers B65B 31/00; filling bottles or other containers with liquids or semi-liquids by bottling machines B67C; filling of gas bottles at high pressure for storing gases F17C)
- 3/02 • Machines characterised by the incorporation of means for making the containers or receptacles (making containers or receptacles of interest apart from this application, see the appropriate subclasses)
- 3/04 • Methods of, or means for, filling the material into the containers or receptacles
- 3/06 • • by gravity flow
- 3/08 • • by screw-type feeders

- 3/10 • • by application of pressure to material (by screw-type feeders B65B 3/08)
- 3/12 • • • mechanically, e.g. by pistons or pumps
- 3/14 • • • pneumatically
- 3/16 • • for filling collapsible tubes (for filling valve bags B65B 3/17)
- 3/17 • • for filling valve bags
- 3/18 • Controlling escape of air from containers or receptacles during filling
- 3/22 • Defoaming liquids in connection with filling
- 3/24 • Topping-up containers or receptacles to ensure complete filling
- 3/26 • Methods or devices for controlling the quantity of the material fed or filled
- 3/28 • • by weighing (in general G01G)
- 3/30 • • by volumetric measurement (in general G01F)
- 3/32 • • • by pistons co-operating with measuring chambers
- 3/34 • • by timing of filling operations
- 3/36 • • • and arresting flow by cut-off means
- 5/00 Packaging individual articles in containers or receptacles, e.g. bags, sacks, boxes, cartons, cans, jars**
- 5/02 • Machines characterised by incorporation of means for making the containers or receptacles (from flat, folded, or tubular webs of flexible sheet material B65B 9/00; making containers or receptacles of interest apart from this application, see the appropriate subclasses)
- 5/04 • Packaging single articles
- 5/06 • Packaging groups of articles, the groups being treated as single articles
- 5/08 • Packaging groups of articles, the articles being individually gripped or guided for transfer to the containers or receptacles
- 5/10 • Filling containers or receptacles progressively or in stages by introducing successive articles, or layers of articles
- 5/12 • • Introducing successive articles, e.g. confectionery products, of different shape or size in predetermined positions
- 7/00 Closing containers or receptacles after filling** (combinations of container-closing apparatus with apparatus for filling containers B65B 1/00, B65B 3/00, B65B 5/00; under special atmospheric or gaseous conditions B65B 31/00; devices for, or methods of, sealing or securing package folds or closures, e.g. twisted bag necks, B65B 51/00; shrinking wrappers, containers, container covers or container cover securing members during or after packaging B65B 53/00)
- 7/01 • Machines characterised by incorporation of means for making the closures before applying (making closures, of interest apart from this application, see the relevant subclass) [6]
- 7/02 • Closing containers or receptacles deformed by, or taking-up shape of, contents, e.g. bags, sacks
- 7/04 • • by tucking-in mouth portion to form two flaps and subsequently folding-down
- 7/06 • • by collapsing mouth portion, e.g. to form a single flap
- 7/08 • • • and folding
- 7/10 • • • and rolling-in
- 7/12 • • • and twisting
- 7/14 • Closing collapsible or resilient tubes, e.g. for tooth-paste, for lighter fuel

- 7/16 • Closing semi-rigid or rigid containers or receptacles not deformed by, or not taking-up shape of, contents, e.g. boxes, cartons (closing cans by metal-working operations B21D 51/26)
- 7/18 • • by collapsing mouth portion and subsequently folding-down or securing flaps
- 7/20 • • by folding-down preformed flaps
- 7/22 • • • and inserting flap portions between contents and wall
- 7/24 • • • and interengaging tongue-and-slot closures
- 7/26 • • by closing hinged lids
- 7/28 • • by applying separate preformed closures, e.g. lids, covers
- 9/00 Enclosing successive articles, or quantities of material, e.g. liquids or semiliquids, in flat, folded, or tubular webs of flexible sheet material; Subdividing filled flexible tubes to form packages**
- 9/02 • Enclosing articles, or quantities of material, between opposed webs
- 9/04 • • one or both webs being formed with pockets for the reception of the articles, or of the quantities of material
- 9/06 • Enclosing articles, or quantities of material, in a longitudinally-folded web, or in a web folded into a tube about the articles or quantities of material placed upon it
- 9/08 • • in a web folded and sealed transversely to form pockets which are subsequently filled and then closed by sealing
- 9/10 • Enclosing articles, or quantities of material, in preformed tubular webs, or in webs formed into tubes around filling nozzles, e.g. extruded tubular webs (sausage making A22C 11/00)
- 9/12 • • Subdividing filled tubes to form two or more packages by sealing or securing involving displacement of contents
- 9/13 • • the preformed tubular webs being supplied in a flattened state [3]
- 9/14 • • • Devices for distending the tubular webs [3]
- 9/15 • • the preformed tubular webs being stored on filling nozzles [3]
- 9/18 • • • Devices for storing tubular webs [3]
- 9/20 • • the webs being formed into tubes in situ around the filling nozzles [3]
- 9/22 • • • Forming shoulders; Tube formers [3]
- 9/24 • • the tubes being formed in situ by extrusion [3]
- 11/00 Wrapping, e.g. partially or wholly enclosing, articles, or quantities of material, in strips, sheets, or blanks, of flexible material** (bundling articles by applying narrow strips or bands of flexible material B65B 13/00; devices for folding or bending wrappers around contents B65B 49/00; devices for gathering or twisting wrappers B65B 51/00)
- 11/02 • Wrapping articles, or quantities of material, without changing their position during the wrapping operation, e.g. in moulds with hinged folders (by doubling a wrapper and securing its opposed free margins to enclose contents B65B 11/48; by disposing contents between two sheets and securing their opposed free margins B65B 11/50; covering or wrapping cores by winding webs, tapes, or filamentary material B65H 81/00)
- 11/04 • • the articles being rotated
- 11/06 • Wrapping articles, or quantities of material, by conveying wrapper and contents in defined paths
- 11/08 • • in a single straight path
- 11/10 • • • to fold the wrappers in tubular form about contents
- 11/12 • • • • and then to form closing folds of similar form at opposite ends of the tube
- 11/14 • • • • the ends of the tube being subsequently twisted
- 11/16 • • • to fold the wrappers in channel form about contents and then to close the ends of the channel by folding and finally the mouth of the channel by folding or twisting
- 11/18 • • in two or more straight paths
- 11/20 • • • to fold the wrappers in tubular form about contents
- 11/22 • • • • and then to form closing folds of similar form at opposite ends of the tube
- 11/24 • • • • the ends of the tube being subsequently twisted
- 11/26 • • • to fold the wrappers in channel form about contents and then to close the ends of the channel by folding and finally the mouth of the channel by folding or twisting
- 11/28 • • in a curved path, e.g. on rotary tables or turrets
- 11/30 • • • to fold the wrappers in tubular form about contents
- 11/32 • • • • and then to form closing folds of similar form at opposite ends of the tube
- 11/34 • • • • the ends of the tube being subsequently twisted
- 11/36 • • • to fold the wrappers in channel form about contents and then to close the ends of the channel by folding and finally the mouth of the channel by folding or twisting
- 11/38 • • in a combination of straight and curved paths
- 11/40 • • • to fold the wrappers in tubular form about contents
- 11/42 • • • • and then to form closing folds of similar form at opposite ends of the tube
- 11/44 • • • • the ends of the tube being subsequently twisted
- 11/46 • • • to fold the wrappers in channel form about contents and then to close the ends of the channel by folding and finally the mouth of the channel by folding or twisting
- 11/48 • Enclosing articles, or quantities of material, by folding a wrapper, e.g. a pocketed wrapper, and securing its opposed free margins to enclose contents
- 11/50 • Enclosing articles, or quantities of material, by disposing contents between two sheets, e.g. pocketed sheets, and securing their opposed free margins (apparatus or devices for forming pockets in or from sheets, blanks or webs B65B 47/00)
- 11/52 • • one sheet being rendered plastic, e.g. by heating, and forced by fluid pressure, e.g. vacuum, into engagement with the other sheet and contents, e.g. skin-packaging
- 11/54 • Wrapping by causing the wrapper to embrace one end and all sides of the contents, and closing the wrapper onto the opposite end by forming regular or irregular pleats
- 11/56 • Rolling articles with wrappers along a supporting surface (for bottles B65B 21/26)
- 11/58 • Applying two or more wrappers, e.g. in succession
- 13/00 Bundling articles** (specially adapted for harvesting A01D 37/00, A01D 39/00, A01D 59/00, A01F 1/00; bundling particular articles presenting special problems using string, wire, or narrow tape or band B65B 27/00)

- 13/02 • Applying and securing binding material around articles or groups of articles, e.g. using strings, wires, strips, bands, or tapes (tying devices in baling presses A01F 15/14, B30B 9/30; applying reinforcing means to non-metal sleepers E01B 31/28) [3]
- 13/04 • • with means for guiding the binding material around the articles prior to severing from supply
- 13/06 • • • Stationary ducts or channels
- 13/08 • • • Single guide or carrier for the free end of material movable part-way around articles from one side only
- 13/10 • • • Carriers travelling completely around the articles while holding the free end of material
- 13/12 • • • • attached to rotating rings
- 13/14 • • • Pairs of carriers or guides movable around opposite sides of the articles
- 13/16 • • with means for severing the binding material from supply and then applying it around the articles
- 13/18 • Details of, or auxiliary devices used in, bundling machines
- 13/20 • • Means for compressing or compacting bundles prior to bundling
- 13/22 • • Means for controlling tension of binding means
- 13/24 • • Securing ends of binding material
- 13/26 • • • by knotting
- 13/28 • • • by twisting
- 13/30 • • • by deforming the overlapping ends of the strip or band
- 13/32 • • • by welding, soldering, or heat-sealing; by applying adhesive
- 13/34 • • • by applying separate securing members, e.g. deformable clips
- 15/00 Attaching articles to cards, sheets, strings, webs, or other carriers**
- 15/02 • Attaching small articles, e.g. buttons, to cards (cards for buttons, collar-studs, or sleeve-links A44B 7/00)
- 15/04 • Attaching a series of articles, e.g. small electrical components, to a continuous web
- 17/00 Other machines, apparatus, or methods for packaging articles or materials**
- 17/02 • Joining articles, e.g. cans, directly to each other for convenience of storage, transport, or handling
- Machines, apparatus, or methods adapted for packaging articles or materials presenting special problems, or for special packaging operations; Unpacking bottles or eggs**
- 19/00 Packaging rod-shaped or tubular articles susceptible to damage by abrasion or pressure, e.g. cigarettes, cigars, macaroni, spaghetti, drinking straws, welding electrodes** (final treatment of cigars or cigarettes after manufacture A24C 1/38, A24C 5/60)
- 19/02 • Packaging cigarettes
- 19/04 • • Arranging, feeding, or orientating the cigarettes
- 19/06 • • • Turning individual cigarettes to present printed marks in desired position
- 19/08 • • • Positioning oval cigarettes in overlapped arrangement
- 19/10 • • • Arranging cigarettes in layers each comprising a predetermined number
- 19/12 • • Inserting the cigarettes, or wrapped groups thereof, into preformed containers
- 19/14 • • • into pocket boxes, e.g. boxes of rectangular form closed at one end by a flap adapted to be inserted into a slot in the body
- 19/16 • • • • into boxes with two pockets
- 19/18 • • • into drawer-and-shell type boxes or cartons
- 19/20 • • • into boxes with hinged lids
- 19/22 • • Wrapping the cigarettes; Packaging the cigarettes in containers formed by folding wrapping material around formers
- 19/24 • • • using hollow mandrels through which groups of cigarettes are fed
- 19/26 • Machines specially adapted for packaging cigars
- 19/28 • Control devices for cigarette or cigar packaging machines (of general application in packaging machines B65B 57/00)
- 19/30 • • responsive to presence of faulty articles, e.g. incorrectly-filled cigarettes
- 19/32 • • responsive to incorrect grouping of articles or to incorrect filling of packages
- 19/34 • Packaging other rod-shaped articles, e.g. sausages, macaroni, spaghetti, drinking straws, welding electrodes
- 21/00 Packaging or unpacking of bottles** (bundling bottles B65B 27/04)
- 21/02 • into or from preformed containers, e.g. crates
- 21/04 • • Arranging, assembling, feeding, or orientating the bottles prior to introduction into, or after removal from, containers
- 21/06 • • • Forming groups of bottles
- 21/08 • • Introducing or removing single bottles, or groups of bottles, e.g. for progressive filling or emptying of containers
- 21/10 • • • using gravity flow
- 21/12 • • • using grippers engaging bottles, e.g. bottle necks (grippers in general B25J) [3]
- 21/14 • • Introducing or removing groups of bottles, for filling or emptying containers in one operation
- 21/16 • • • using gravity flow
- 21/18 • • • using grippers engaging bottles, e.g. bottle necks (grippers in general B25J) [3]
- 21/20 • • • • with means for varying spacing of bottles
- 21/22 • • • by inverting and raising or lowering the container relative to bottles
- 21/24 • Enclosing bottles in wrappers
- 21/26 • • Applying wrappers to individual bottles by operations involving rotation or rolling of the bottles (to articles in general B65B 11/56)
- 23/00 Packaging fragile or shock-sensitive articles other than bottles; Unpacking eggs** (embedding articles in shock-absorbing media B65B 55/20)
- 23/02 • Packaging or unpacking eggs
- 23/04 • • Erecting egg trays or cartons from collapsed blanks
- 23/06 • • Arranging, feeding, or orientating the eggs to be packed; Removing eggs from trays or cartons
- 23/08 • • • using grippers (testing, sorting, or cleaning eggs A01K 43/00; egg grippers for cooking purposes A47J 29/06)
- 23/10 • Packaging biscuits
- 23/12 • • Arranging, feeding, or orientating the biscuits to be packaged (in connection with baking A21C 15/00)
- 23/14 • • • Forming groups of biscuits
- 23/16 • • Inserting the biscuits, or wrapped groups thereof, into preformed containers
- 23/18 • • Wrapping individual biscuits, or groups of biscuits
- 23/20 • Packaging plate glass, tiles, or shingles

- 23/22 • Packaging glass ampoules, lamp bulbs, radio valves or tubes, or the like
- 25/00 Packaging other articles presenting special problems (bundling B65B 27/00)**
- 25/02 • Packaging agricultural or horticultural products
- 25/04 • • Packaging fruit or vegetables (bag or sack-filling devices associated with digging harvesters A01D 33/10)
- 25/06 • Packaging slices or specially-shaped pieces of meat, cheese, or other plastic or tacky products
- 25/08 • • between layers or strips of sheet or web material, e.g. in webs folded to zig-zag form
- 25/10 • • Forming sector-shaped packages of cheese or like plastic products
- 25/12 • • • and enclosing in circular containers
- 25/14 • Packaging paper or like sheets, envelopes, or newspapers, in flat, folded, or rolled form
- 25/16 • Packaging bread or like bakery products, e.g. unsliced loaves [2]
- 25/18 • • Wrapping sliced bread (cutting or slicing machines or devices specially adapted for baked articles other than bread A21C 15/04, for bread B26B, B26D)
- 25/20 • Packaging garments, e.g. socks, stockings, shirts
- 25/22 • Packaging articles of food, e.g. fish fillets, intended to be cooked in the package
- 25/24 • Packaging annular articles, e.g. tyres
- 27/00 Bundling particular articles presenting special problems using string, wire, or narrow tape or band; Baling fibrous material, e.g. peat, not otherwise provided for (bundling articles in general B65B 13/00)**
- 27/02 • Bundling bricks or other building blocks
- 27/04 • Bundling groups of cans or bottles
- 27/06 • Bundling coils of wire or like annular objects
- 27/08 • Bundling paper sheets, envelopes, bags or other thin flat articles; Bundling newspapers
- 27/10 • Bundling rods, sticks, or like elongated objects
- 27/12 • Baling or bundling compressible fibrous material, e.g. peat (baling presses for straw, hay, or the like A01F 15/00; baling presses in general B30B 9/30)
- 29/00 Packaging of materials presenting special problems**
- 29/02 • Packaging of substances, e.g. tea, which are intended to be infused in the package
- 29/04 • • Attaching, or forming and attaching, string handles or tags to tea bags
- 29/06 • Packaging of substances to which a further ingredient, e.g. water, is to be added in the package by the user for mixing prior to dispensing
- 29/08 • Packaging of edible materials intended to be cooked in the package (infusible substances B65B 29/02)
- 29/10 • Packaging two or more different substances isolated from one another in the package but capable of being mixed without opening the package, e.g. forming packages containing a resin and hardener isolated by a frangible partition
- 31/00 Packaging articles or materials under special atmospheric or gaseous conditions; Adding propellants to aerosol containers (auxiliary treatments during loading or unloading in a fluid medium other than air B65G 69/20)**
- 31/02 • Filling, closing, or filling and closing, containers in chambers maintained under vacuum or superatmospheric pressure or containing a special atmosphere, e.g. of inert gas

- 31/04 • Evacuating, pressurising, or gasifying filled containers or wrappers by means of nozzles through which air or other gas, e.g. an inert gas, is withdrawn or supplied (nozzles for introducing articles or materials into containers B65B 39/00)
- 31/06 • • the nozzle being arranged for insertion into, and withdrawal from, the mouth of a filled container and operating in conjunction with means for sealing the container mouth
- 31/08 • • the nozzle being adapted to pierce the container or wrapper
- 31/10 • Adding propellants in solid form to aerosol containers
- 33/00 Packaging articles by applying removable, e.g. strippable, coatings (B65B 11/52 takes precedence; applying liquids or other fluent materials to surfaces in general B05; wrapping cores by winding B65H 81/00) [3]**
- 33/02 • Packaging small articles, e.g. spare parts for machines or engines
- 33/04 • Packaging large articles, e.g. complete machines, aircraft
- 33/06 • • the coating being applied to a supporting layer or framework of sheets or strips of thin flexible material, e.g. cocoon packaging

**Details of, auxiliary devices applied to, or auxiliary measures taken in, machines, apparatus, or methods, not otherwise provided for**

- 35/00 Supplying, feeding, arranging, or orientating articles to be packaged (cigarettes B65B 19/04; bottles B65B 21/04; eggs B65B 23/06; biscuits B65B 23/12; if not restricted to packaging machines B07C, B65G, B65H)**
- 35/02 • Supply magazines
- 35/04 • • with buffer storage devices
- 35/06 • Separating single articles from loose masses of articles
- 35/08 • • using pocketed conveyers
- 35/10 • Feeding, e.g. conveying, single articles (orientating B65B 35/56)
- 35/12 • • by gravity
- 35/14 • • by agitators or vibrators
- 35/16 • • by grippers
- 35/18 • • • by suction-operated grippers
- 35/20 • • by reciprocating or oscillatory pushers
- 35/22 • • by roller-ways
- 35/24 • • by endless belts or chains
- 35/26 • • by rotary conveyers
- 35/28 • • by pneumatic conveyers
- 35/30 • Arranging and feeding articles in groups (orientating B65B 35/56)
- 35/32 • • by gravity
- 35/34 • • by agitators or vibrators
- 35/36 • • by grippers
- 35/38 • • • by suction-operated grippers
- 35/40 • • by reciprocating or oscillatory pushers
- 35/42 • • by roller-ways
- 35/44 • • by endless belts or chains
- 35/46 • • by rotary conveyers
- 35/48 • • by pneumatic conveyers
- 35/50 • • Stacking one article, or group of articles, upon another before packaging
- 35/52 • • • building-up the stack from the bottom

- 35/54 • • Feeding articles along multiple paths to a single packaging position
- 35/56 • Orientating, i.e. changing the attitude of, articles, e.g. of non-uniform cross-section
- 35/58 • • Turning articles by positively-acting means, e.g. to present labelled portions in uppermost position
- 37/00 Supplying or feeding fluent-solid, plastic, or liquid material, or loose masses of small articles, to be packaged** (methods of, or means for, filling individual containers with such materials or articles B65B 1/04, B65B 3/04)
- 37/02 • by gravity flow
- 37/04 • by vibratory feeders
- 37/06 • by pistons or pumps
- 37/08 • by rotary feeders
- 37/10 • • of screw type
- 37/12 • • of centrifugal type
- 37/14 • by pneumatic feeders
- 37/16 • Separating measured quantities from supply (in container-filling machines B65B 1/30, B65B 3/26)
- 37/18 • • by weighing (in general G01G)
- 37/20 • • by volume measurement (in general G01F)
- 39/00 Nozzles, funnels, or guides for introducing articles or materials into containers or wrappers** (nozzles in general B05B; funnels in general B67C 11/00)
- 39/02 • Expansible or contractible nozzles, funnels, or guides
- 39/04 • having air-escape, or air-withdrawal, passages
- 39/06 • adapted to support containers or wrappers
- 39/08 • • by means of clamps
- 39/10 • • • operating automatically
- 39/12 • movable towards, or away from, container or wrapper during filling or depositing
- 39/14 • movable with a moving container or wrapper during filling or depositing
- 41/00 Supplying or feeding container-forming sheets or wrapping material** (in general B65H)
- 41/02 • Feeding sheets or wrapper blanks
- 41/04 • • by grippers
- 41/06 • • • by suction-operated grippers
- 41/08 • • by reciprocating or oscillating pushers
- 41/10 • • by rollers
- 41/12 • Feeding webs from rolls
- 41/14 • • by grippers
- 41/16 • • by rollers
- 41/18 • Registering sheets, blanks, or webs
- 43/00 Forming, feeding, opening, or setting-up containers or receptacles in association with packaging** (forming pockets in sheets, blanks, or webs, by pressing the material into forming dies or moving it through folding dies B65B 47/00)
- 43/02 • Forming flat bags from individual sheets or blanks
- 43/04 • Forming flat bags from webs
- 43/06 • • from more than one web
- 43/08 • Forming three-dimensional containers from sheet material
- 43/10 • • by folding the material
- 43/12 • Feeding flexible bags or carton blanks in flat or collapsed state; Feeding flat bags connected to form a series or chain
- 43/14 • • Feeding individual bags or carton blanks from piles or magazines
- 43/16 • • • by grippers
- 43/18 • • • • by suction-operated grippers
- 43/20 • • • by reciprocating or oscillating pushers
- 43/22 • • • by rollers
- 43/24 • Breaking creases to facilitate setting-up cartons
- 43/26 • Opening or distending bags; Opening, erecting, or setting-up boxes, cartons, or carton blanks
- 43/28 • • by grippers co-operating with fixed supports
- 43/30 • • by grippers engaging opposed walls, e.g. suction-operated
- 43/32 • • by external pressure diagonally applied
- 43/34 • • by internal pressure
- 43/36 • • • applied pneumatically
- 43/38 • Opening hinged lids
- 43/39 • • Opening-out closure flaps clear of bag, box, or carton mouth
- 43/40 • Removing separate lids
- 43/41 • Opening drawer-and-shell cartons
- 43/42 • Feeding or positioning bags, boxes, or cartons in the distended, opened, or set-up state; Feeding preformed rigid containers, e.g. tins, capsules, glass tubes, glasses, to the packaging position; Locating containers or receptacles at the filling position (by means of filling nozzles B65B 39/00); Supporting containers or receptacles during the filling operation (by filling nozzles B65B 39/00)
- 43/44 • • from supply magazines (B65B 43/46-B65B 43/52 take precedence) [3]
- 43/46 • • using grippers
- 43/48 • • using reciprocating or oscillating pushers
- 43/50 • • using rotary tables or turrets
- 43/52 • • using roller-ways or endless conveyers
- 43/54 • • Means for supporting containers or receptacles during the filling operation
- 43/56 • • • movable stepwise to position container or receptacle for the reception of successive increments of contents
- 43/58 • • • • vertically movable
- 43/59 • • • vertically movable (B65B 43/58 takes precedence) [3]
- 43/60 • • • rotatable
- 43/62 • • • • about an axis located at the filling position, e.g. the axis of the container or receptacle
- 45/00 Apparatus or devices for supporting or holding wrappers during wrapping operation** (filling nozzles, funnels, guides B65B 39/00)
- 47/00 Apparatus or devices for forming pockets or receptacles in or from sheets, blanks, or webs, comprising essentially a die into which the material is pressed or a folding die through which the material is moved**
- 47/02 • with means for heating the material prior to forming
- 47/04 • by application of mechanical pressure
- 47/06 • • using folding dies
- 47/08 • by application of fluid pressure
- 47/10 • • by vacuum
- 49/00 Devices for folding or bending wrappers around contents**
- 49/02 • Fixed or resiliently-mounted folders, e.g. non-driven rollers
- 49/04 • • Ploughs or plates with inclined slots or opposed inclined edges
- 49/06 • Resilient folders, e.g. brushes, diaphragms
- 49/08 • Reciprocating or oscillating folders
- 49/10 • Folders movable in closed non-circular paths

- 49/12 • Rotary folders
- 49/14 • Folders forming part of, or attached to, conveyers for partially-wrapped articles
- 49/16 • Pneumatic means, e.g. air jets
- 51/00 Devices for, or methods of, sealing or securing package folds or closures, e.g. twisted bag necks**
- 51/02 • Applying adhesives or sealing liquids (activating adhesives by applying heat or pressure B65B 51/10)
- 51/04 • Applying separate sealing or securing members, e.g. clips (applying separate lids or covers B65B 7/28)
- 51/05 • • Stapling
- 51/06 • • Applying adhesive tape (adhesive tape dispensers B65H 35/07)
- 51/07 • • Sewing or stitching
- 51/08 • • Applying binding material, e.g. to twisted bag necks
- 51/09 • by deformation of the closure **[6]**
- 51/10 • Applying or generating heat or pressure or combinations thereof (B65B 51/09 takes precedence) **[6]**
- 51/12 • • by resilient means, e.g. brushes
- 51/14 • • by reciprocating or oscillating members
- 51/16 • • by rotary members
- 51/18 • • by endless bands or chains
- 51/20 • • by fluid pressure acting directly on folds or on opposed surfaces, e.g. using hot-air jets (shrinking wrappers by heating B65B 53/02)
- 51/22 • • by friction or ultrasonic or high-frequency electrical means
- 51/24 • • to produce bead seals (combined with severing by heated wires or rods B65B 61/10)
- 51/26 • • Devices specially adapted for producing transverse or longitudinal seams in webs or tubes
- 51/28 • • • Rollers for producing longitudinal and transverse seams simultaneously
- 51/30 • • • Devices, e.g. jaws, for applying pressure and heat successively, e.g. for subdividing filled tubes (for subdividing filled tubes involving displacement of contents B65B 9/12)
- 51/32 • Cooling, or cooling and pressing, package closures after heat-sealing
- 53/00 Shrinking wrappers, containers, container covers or container cover securing members during or after packaging**
- 53/02 • by heat
- 53/04 • • supplied by liquids
- 53/06 • • supplied by gases, e.g. hot-air jets
- 55/00 Preserving, protecting, or purifying packages or package contents in association with packaging** (by packaging under special atmospheric or gaseous conditions B65B 31/00; devices for placing protecting sheets, plugs, or wads over contents B65B 61/22; if not restricted to packaging A23L, A61L)
- 55/02 • Sterilising, e.g. of complete packages
- 55/04 • • Sterilising wrappers or receptacles prior to, or during, packaging
- 55/06 • • • by heat
- 55/08 • • • by irradiation
- 55/10 • • • by liquids or gases (B65B 55/06 takes precedence)
- 55/12 • • Sterilising contents prior to, or during, packaging
- 55/14 • • • by heat
- 55/16 • • • by irradiation
- 55/18 • • • by liquids or gases (B65B 55/14 takes precedence)
- 55/19 • • • by adding materials intended to remove free oxygen or to develop inhibitor gases, e.g. vapour-phase inhibitors
- 55/20 • Embedding contents in shock-absorbing media, e.g. plastic foam, granular material
- 55/22 • Immersing contents in protective liquids
- 55/24 • Cleaning of, or removing dust from, containers, wrappers, or packaging
- 57/00 Automatic control, checking, warning, or safety devices** (registering wrapping or container-forming material fed from rolls B65B 41/18; accident-prevention measures applicable for general use F16P; photoelectric cells H01J, H01L; such devices in general, see the relevant classes)
- 57/02 • responsive to absence, presence, abnormal feed, or misplacement of binding or wrapping material, containers, or packages
- 57/04 • • and operating to control, or to stop, the feed of such material, containers, or packages
- 57/06 • • and operating to control, or to stop, the feed of articles or material to be packaged
- 57/08 • • and operating to stop, or to control the speed of, the machine as a whole
- 57/10 • responsive to absence, presence, abnormal feed, or misplacement of articles or materials to be packaged
- 57/12 • • and operating to control, or stop, the feed of wrapping materials, containers, or packages
- 57/14 • • and operating to control, or stop, the feed of articles or material to be packaged
- 57/16 • • and operating to stop, or to control the speed of, the machine as a whole
- 57/18 • causing operation of audible or visible alarm signals
- 57/20 • Applications of counting devices for controlling the feed of articles (other applications B65B 65/08)
- 59/00 Arrangements to enable machines to handle articles of different sizes, to produce packages of different sizes, to vary the contents of packages, or to give access for cleaning or maintenance purposes**
- 59/02 • Arrangements to enable adjustments to be made while the machine is running (weight or volumetric adjustment of material to be packaged B65B 1/30, B65B 3/26)
- 59/04 • Machines constructed with readily-detachable units or assemblies, e.g. to facilitate maintenance
- 61/00 Auxiliary devices, not otherwise provided for, for operating on sheets, blanks, webs, binding material, containers or packages**
- 61/02 • for perforating, scoring, or applying code or date marks on material prior to packaging
- 61/04 • for severing webs, or for separating joined packages
- 61/06 • • by cutting
- 61/08 • • • using rotary cutters
- 61/10 • • • using heated wires or cutters
- 61/12 • • by tearing along perforations or lines of weakness
- 61/14 • for incorporating, or forming and incorporating, handles or suspension means in packages (attaching, or forming and attaching, string handles or tags to tea-bags B65B 29/04)
- 61/16 • • Forming suspension apertures in packages
- 61/18 • for applying or incorporating package-opening or unpacking elements, e.g. tear-strips



- 61/20 • for adding cards, coupons, or other inserts to package contents (adding unpacking elements B65B 61/18; labelling B65C)
- 61/22 • • for placing protecting sheets, plugs, or wads over contents, e.g. cotton-wool in bottles of pills
- 61/24 • for shaping or reshaping completed packages
- 61/26 • for marking or coding completed packages
- 61/28 • for discharging completed packages from machines
- 63/00 Auxiliary devices, not otherwise provided for, for operating on articles or materials to be packaged**
- 63/02 • for compressing or compacting articles or materials prior to wrapping or insertion in containers or receptacles (tableting or compressing of powders B30B 11/00)
- 63/04 • for folding or winding articles, e.g. gloves, stockings (folding or winding webs or filamentary material in general B65H 45/00, B65H 54/00; folding textile articles in connection with laundering preparatory to packaging D06F 89/00)
- 63/06 • • Forming elongated hanks, e.g. of shoe laces
- 63/08 • for heating or cooling articles or materials to facilitate packaging
- 65/00 Details peculiar to packaging machines and not otherwise provided for; Arrangements of such details**
- 65/02 • Driving gear
- 65/04 • Mechanisms for converting a continuous rotary motion to intermittent rotary motion, e.g. Geneva drives
- 65/06 • coated or treated with anti-friction or anti-sticking materials, e.g. polytetrafluoroethylene
- 65/08 • Devices for counting or registering the number of articles handled, or the number of packages produced by the machine
- 67/00 Apparatus or devices facilitating manual packaging operations; Sack holders**
- 67/02 • Packaging of articles or materials in containers
- 67/04 • • Devices facilitating insertion of single articles, or groups or articles, into bags
- 67/06 • • Manually-operable devices for closing bag necks, by applying and securing lengths of string, wire, or tape
- 67/08 • Wrapping of articles
- 67/10 • • Wrapping-tables
- 67/12 • Sack holders, i.e. stands or frames with means for supporting sacks in the open condition to facilitate filling with articles or materials
- 69/00 Unpacking of articles or materials, not otherwise provided for**

**B65C LABELLING OR TAGGING MACHINES, APPARATUS, OR PROCESSES** (nailing or stapling in general B25C, B27F; processes for applying decalcomanias B44C 1/16; applying labels for packaging purposes B65B; labels, name-plates G09F)

#### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "labels" covers also decalcomanias, stamps or the like.

- 1/00 Labelling flat essentially-rigid surfaces** (labelling of fabrics B65C 5/00)
- 1/02 • Affixing labels to one flat surface of articles, e.g. of packages, of flat bands
- 1/04 • Affixing labels, e.g. wrap-around labels, to two or more flat surfaces of a polyhedral article
- 3/00 Labelling other than flat surfaces** (of fabrics B65C 5/00)
- 3/02 • Affixing labels to elongated objects, e.g. wires, cables, bars, tubes
- 3/04 • • Applying bands or labels to cigars or cigarettes
- 3/06 • Affixing labels to short rigid containers
- 3/08 • • to container bodies
- 3/10 • • • the container being positioned for labelling with its centre-line horizontal
- 3/12 • • • • by rolling the labels onto cylindrical containers, e.g. bottles
- 3/14 • • • the container being positioned for labelling with its centre-line vertical
- 3/16 • • • • by rolling the labels onto cylindrical containers, e.g. bottles
- 3/18 • • to container necks
- 3/20 • • to bottle closures (applying closures or capsules to bottles B67B)
- 3/22 • • • Affixing metal foil coverings
- 3/24 • • • Affixing labels indicating original state of bottle snap or screw closure
- 3/26 • Affixing labels to non-rigid containers, e.g. bottles made of polyethylene, boxes to be inflated by internal air pressure prior to labelling
- 5/00 Labelling fabrics or comparable materials or articles with deformable surface, e.g. paper, fabric rolls, stockings, shoes** (affixing labels to non-rigid containers B65C 3/26; by sewing D05B)
- 5/02 • using adhesives
- 5/04 • • Thermo-activatable adhesives
- 5/06 • using staples
- 7/00 Affixing tags** (in combination with filling of tea bags B65B 29/04)
- 9/00 Details of labelling machines or apparatus**
- 9/02 • Devices for moving articles, e.g. containers, past labelling station
- 9/04 • • having means for rotating the articles
- 9/06 • Devices for presenting articles in predetermined attitude or position at labelling station
- 9/08 • Label feeding
- 9/10 • • Label magazines
- 9/12 • • Removing separate labels from stacks (for printing B41F)
- 9/14 • • • by vacuum
- 9/16 • • • by wetting devices
- 9/18 • • Label feeding from strips, e.g. from rolls
- 9/20 • Gluing the labels or articles
- 9/22 • • by wetting, e.g. by applying liquid glue or a liquid to a dry glue coating
- 9/24 • • by heat
- 9/25 • • • by thermo-activating the glue [2]
- 9/26 • Devices for applying labels

## B65C

9/28	• • Air-blast devices	11/00	<b>Manually-controlled or manually-operable label dispensers, e.g. modified for the application of labels to articles</b> (special furniture, fittings, or accessories for shops, storehouses, bars, or the like A47F; for paper napkins, for toilet paper A47K; for playing cards A63F; movable-strip writing or reading apparatus B42D 19/00; adhesive tape dispensers B65H 35/07; dispensers for tickets G07B; coin-operated dispensers for stamps G07F)
9/30	• • Rollers		
9/32	• • • Co-operating rollers between which articles and labels are fed		
9/34	• • Flexible bands		
9/36	• • Wipers; Pressers		
9/38	• Label cooling or drying		
9/40	• Controls; Safety devices		
9/42	• • Label feed control	11/02	• having printing equipment
9/44	• • • by special means responsive to marks on labels or articles (feed control in wrapping B65B)	11/04	• having means for moistening the labels
9/46	• Applying date marks, code marks, or the like, to the label during labelling (manually-controlled or operable apparatus having printing equipment B65C 11/02; ticket printing and issuing G07B 1/00)	11/06	• having means for heating thermo-activatable labels

**B65D CONTAINERS FOR STORAGE OR TRANSPORT OF ARTICLES OR MATERIALS, e.g. BAGS, BARRELS, BOTTLES, BOXES, CANS, CARTONS, CRATES, DRUMS, JARS, TANKS, HOPPERS, FORWARDING CONTAINERS; ACCESSORIES, CLOSURES, OR FITTINGS THEREFOR; PACKAGING ELEMENTS; PACKAGES** (containers specially adapted for storing agricultural or horticultural products A01F 25/14; containers specially adapted for use in dairies A01J; purses, luggage, hand carried bags A45C; travelling or camp equipment, sacks or packs carried on the body A45F; household or table equipment A47G; mail or newspapers receptacles A47G 29/12; kitchen equipment A47J; packages or wrapping arrangements for used absorbent pads A61F 13/551; associated with vehicles, see the appropriate subclass of B60-B64; machines, apparatus, or devices for, or methods of, packaging articles or materials B65B; sack holders B65B 67/00; refuse receptacles B65F 1/00; handling sheets, webs or filamentary material B65H; load-engaging elements or devices attached to lifting or lowering gear of cranes or adapted for connection therewith for transmitting lifting forces B66C; liquid handling B67; storing gases F17; making containers, see subclasses dealing with the working of the material concerned)

### Note(s)

1. This subclass covers:
  - containers, packaging elements or packages with auxiliary means or provision for displaying articles or materials;
  - methods of packaging which are wholly characterised by the form of the package produced or the form of the container or packaging element used, as distinct from the operations performed or the apparatus employed, which are covered by subclass B65B.
2. This subclass, which is intended to be as comprehensive as possible, only excludes containers or packages of a nature clearly confined to a single other subclass, which are classified in that subclass.
3. In this subclass, groups B65D 5/00, B65D 27/00, B65D 30/00 or B65D 65/00 include constructional features of foldable or erectable container or wrapper blanks as well as the containers or wrappers formed by folding or erecting such blanks.
4. Containers, packaging elements or packages classified in group B65D 85/00, are also classified according to the constructional or functional features, if such features are of interest.
5. Large containers, as defined in Note (6) below, are classified in groups B65D 88/00 or B65D 90/00. Features that are of interest for containers in general may also be classified in other groups of subclass B65D when they are considered to represent information of interest for search.
6. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "rigid or semi-rigid containers" includes:
    - a. containers not deformed by, or not taking-up the shape of, their contents;
    - b. containers adapted to be temporarily deformed to expel their contents;
    - c. pallets;
    - d. trays;
  - "flexible containers" includes:
    - a. containers deformed by, or taking-up the shape of, their contents;
    - b. containers adapted to be permanently deformed to expel their contents;
  - "packaging elements" includes:
    - a. elements, other than containers, for covering, protecting, stiffening, or holding together articles or materials to be stored or transported;
    - b. packaging materials of special type or form not provided for in other subclasses;
  - "packages" includes:
    - a. combinations of containers or packaging elements with articles or materials to be stored or transported;
    - b. articles joined together for convenience of storage or transport;
  - "paper" includes materials, e.g. cardboard, plastic sheet materials, laminated materials, or metal foils, worked in a manner analogous to paper;
  - "large containers", in groups B65D 88/00 or B65D 90/00, means containers having about the size of containers used in container traffic, sometimes referred to as freight, forwarding or "ISO" (International Standardization Organization) containers, or larger containers.
7. Tamper-indicating means for containers or closures are classified in the group appropriate to the type of container or closure, e.g. B65D 5/43, B65D 5/54, B65D 17/00, B65D 27/30, B65D 27/34, B65D 33/34, B65D 41/32, B65D 47/36, B65D 49/12, B65D 51/20, B65D 55/06.

**Subclass index****GENERAL CONTAINERS**

Rigid or semi-rigid characterised by

their structure or material.....	1/00-13/00
their kind.....	19/00, 21/00
opening by cutting or tearing.....	17/00
their particular use.....	81/00-85/00
details not otherwise provided for.....	23/00, 25/00

Flexible characterised by

their kind.....	27/00-37/00
their particular use.....	81/00-85/00

LARGE CONTAINERS.....88/00, 90/00

**MOVABLE OR HINGED CLOSURES**

Kinds of closure.....	39/00, 41/00, 43/00, 50/00, 51/00
Clamping or using closures.....	45/00, 47/00, 49/00
Accessories.....	53/00, 55/00

**PACKAGING ELEMENTS**

Material.....	65/00, 67/00
For particular use.....	81/00, 85/00
Accessories	
internal.....	57/00, 59/00
external.....	61/00, 63/00
not otherwise provided for.....	67/00

**KINDS OF PACKAGES**

Bales; articles on carriers; with enclosing tube, sheet, or web; using preformed containers.....	71/00, 73/00, 75/00, 77/00
Assemblies of objects.....	69/00, 71/00
For particular use.....	81/00, 83/00, 85/00
Kinds or details not otherwise provided for.....	79/00

**General kinds of rigid or semi-rigid containers [3]**

<b>1/00</b>	<b>Rigid or semi-rigid containers having bodies formed in one piece, e.g. by casting metallic material, by moulding plastics, by blowing vitreous material, by throwing ceramic material, by moulding pulped fibrous material or by deep-drawing operations performed on sheet material</b> (by winding, bending, or folding paper B65D 3/00, B65D 5/00; specially constructed to be opened by cutting, piercing, or tearing of wall portions B65D 17/00; pallets B65D 19/00; details of bottles or of jars B65D 23/00; bundles of articles held together by packaging elements for convenience of storage or transport, e.g. portable segregating carriers for plural receptacles such as beer cans or pop bottles, B65D 71/00) [5]	1/24	• • with moulded compartments or partitions
		1/26	• • Thin-walled containers, e.g. formed by deep-drawing operations
		1/28	• • • formed of laminated material
		1/30	• • • Groups of containers joined together end-to-end or side-by-side
		1/32	• Containers adapted to be temporarily deformed by external pressure to expel contents (containers with disinfecting linings A61L 2/00; oil cans F16N 3/00)
		1/34	• Trays or like shallow containers
		1/36	• • with moulded compartments or partitions
		1/38	• Baskets or like containers of skeleton or apertured construction
		1/40	• Details of walls (other container details B65D 23/00, B65D 25/00)
1/02	• Bottles or similar containers with necks or like restricted apertures, designed for pouring contents (thermally insulated containers B65D 81/38, A47J 41/00)	1/42	• • Reinforcing or strengthening parts or members
		1/44	• • • Corrugations
1/04	• • Multi-cavity bottles	1/46	• • • Local reinforcements, e.g. adjacent closures
1/06	• • with closable apertures at bottom	1/48	• • • Reinforcements of dissimilar materials, e.g. metal frames in plastic walls
1/08	• • adapted to discharge drops (droppers B65D 47/18)		
1/09	• Ampoules (specially adapted for medical or pharmaceutical purposes A61J 1/06) [5]	<b>3/00</b>	<b>Rigid or semi-rigid containers having bodies or peripheral walls of curved or partially-curved cross-section made by winding or bending paper without folding along defined lines</b> (with end walls of different materials B65D 6/00, B65D 8/00)
1/10	• Jars, e.g. for preserving foodstuffs	3/02	• characterised by shape
1/12	• Cans, casks, barrels, or drums	3/04	• • essentially cylindrical
1/14	• • characterised by shape	3/06	• • essentially conical or frusto-conical
1/16	• • • of curved cross-section, e.g. cylindrical	3/08	• • having a cross-section of varying shape, e.g. circular merging into square or rectangular
1/18	• • • of polygonal cross-section		
1/20	• • characterised by location or arrangement of filling or discharge apertures	3/10	• characterised by form of integral or permanently-secured end closure
1/22	• Boxes or like containers with side walls of substantial depth for enclosing contents		

- 3/12 • • Flanged discs permanently secured, e.g. by adhesives, by heat-sealing
- 3/14 • • • Discs fitting within container end and secured by bending, rolling, or folding operations
- 3/16 • • Discs without flanges engaging a groove in the container body
- 3/18 • • • and secured by rolling in the end of the body
- 3/20 • • with end portion of body adapted to be closed, by flattening or folding operations, e.g. formed with crease lines or flaps
- 3/22 • with double walls; with walls incorporating air-chambers; with walls made of laminated material
- 3/24 • with several compartments
- 3/26 • Opening arrangements or devices incorporated in, or attached to, containers
- 3/28 • Other details of walls
- 3/30 • • Local reinforcements, e.g. metallic rims
- 5/00 **Rigid or semi-rigid containers of polygonal cross-section, e.g. boxes, cartons, trays, formed by folding or erecting one or more blanks made of paper** (pallets B65D 19/00; bundles of articles held together by packaging elements for convenience of storage or transport, e.g. portable segregating carriers for plural receptacles such as beer cans, pop bottles, B65D 71/00; forming foldable or erectable blanks B31B) [5]
- 5/02 • by folding or erecting a single blank to form a tubular body with or without subsequent folding operations, or the addition of separate elements, to close the ends of the body (B65D 5/36 takes precedence)
- 5/04 • • the tubular body having no end closures (shells of drawer-and-shell type containers B65D 5/38)
- 5/06 • • with end-closing or contents-supporting elements formed by folding inwardly a wall extending from, and continuously around, an end of the tubular body
- 5/08 • • with end closures formed by inward-folding of portions of body, e.g. flaps, interconnected by, or incorporating, gusset folds (by inward-folding of a wall extending continuously around an end of the body and incorporating gusset folds B65D 5/06)
- 5/10 • • with end closures formed by inward-folding of self-locking flaps hinged to tubular body
- 5/12 • • with end closures formed separately from tubular body
- 5/14 • • • with inset end closures
- 5/16 • • the tubular body being formed with an aperture or removable portion arranged to allow removal or insertion of contents through one or more sides (contents-dispensing means B65D 5/72)
- 5/18 • by folding a single blank to U-shape to form the base of the container and opposite sides of the body portion, the remaining sides being formed primarily by extensions of one or more of these opposite sides, e.g. flaps hinged thereto (B65D 5/36 takes precedence)
- 5/20 • by folding-up portions connected to a central panel from all sides to form a container body, e.g. of tray-like form (B65D 5/36 takes precedence)
- 5/22 • • held erect by extensions of one or more sides being doubled-over to enclose extensions of adjacent sides
- 5/24 • • with adjacent sides interconnected by gusset folds
- 5/26 • • with extensions of opposite sides mutually interlocking to lie against other sides
- 5/28 • • with extensions of sides permanently secured to adjacent sides, with sides permanently secured together by adhesive strips, or with sides held in place solely by rigidity of material
- 5/30 • • with tongue-and-slot or like connections between sides and extensions of other sides
- 5/32 • having bodies formed by folding and interconnecting two or more blanks (B65D 5/36 takes precedence)
- 5/34 • • one blank forming three sides of the body, and the other blank forming the remaining sides, a hinged lid, and the opposite end closure
- 5/35 • • • one blank forming three sides of a four-sided body, and the other blank forming the remaining side, a hinged lid, and the opposite end closure [2]
- 5/355 • specially adapted to be of variable capacity [6]
- 5/36 • specially constructed to allow collapsing and re-erecting without disengagement of side or bottom connections
- 5/38 • Drawer-and-shell type containers
- 5/40 • specially constructed to contain liquids
- 5/42 • Details of containers or of foldable or erectable container blanks
- 5/43 • • Containers characterised by means discouraging or indicating unauthorised opening of the container [6]
- 5/44 • • Integral, inserted or attached portions forming internal or external fittings [6]
- 5/46 • • • Handles
- 5/462 • • • • formed by folding a blank [6]
- 5/465 • • • • • not integral with the container [6]
- 5/468 • • • • Handholds in container body [6]
- 5/472 • • • • of metal, e.g. wire [6]
- 5/475 • • • • of plastics [6]
- 5/478 • • • • of cord [6]
- 5/48 • • • Partitions
- 5/4805 • • • • integral [6]
- 5/481 • • • • • forming compartments in at least two rows [6]
- 5/482 • • • • • Longitudinal partition provided with cut flaps which are folded perpendicular to the partition [6]
- 5/483 • • • • • formed by folding extensions hinged to the upper or lower edges of a tubular container body (B65D 5/482 takes precedence) [6]
- 5/484 • • • • • formed by folding extensions of side panels of a tray-like container body blank [6]
- 5/485 • • • • • combined with inserted partitions [6]
- 5/486 • • • • • formed by folding extensions hinged to a tubular container body along hinge lines parallel to its axis (B65D 5/481 takes precedence) [6]
- 5/487 • • • • • formed by folding extensions hinged to the upper or lower edges of a tubular container body (B65D 5/483 takes precedence) [6]
- 5/488 • • • • • formed by folding extensions of side panels of a tray-like container body blank (B65D 5/484 takes precedence) [6]
- 5/489 • • • • • formed by folding inwardly portions cut in the container body (B65D 5/481 takes precedence) [6]
- 5/49 • • • • inserted [6]
- 5/491 • • • • • forming compartments in at least two rows (B65D 5/485 takes precedence) [6]

- 5/492 • • • • • formed by folding a single blank (B65D 5/493, B65D 5/494 take precedence) [6]
- 5/493 • • • • • provided with an at least partial bottom [6]
- 5/494 • • • • • Longitudinal partition provided with cut flaps which are folded perpendicular to the partition [6]
- 5/495 • • • • • formed by crossed strips with inter-engaging slots [6]
- 5/496 • • • • • formed by folding strips into a tubular, U- or S- section (B65D 5/491 takes precedence) [6]
- 5/497 • • • • • Blank provided with cut flaps which are folded perpendicular to the blank (B65D 5/491 takes precedence) [6]
- 5/498 • • • • • Partitions with one or more flaps formed by folding, and fixed to, or maintained in position by, the sides of the container body (B65D 5/491, B65D 5/496, B65D 5/497 take precedence) [6]
- 5/499 • • • • • Partitions formed from non-folded strips engaged in slots or grooves in the sides of the container body (B65D 5/491 takes precedence) [6]
- 5/50 • • • Internal supporting or protecting elements for contents (elements formed by inward- folding of a wall extending from, and continuously around, an end of a tubular body B65D 5/06; partitions B65D 5/48)
- 5/52 • • • External stands or display elements for contents
- 5/54 • • Lines of weakness to facilitate opening of container or dividing it into separate parts by cutting or tearing (break-in flaps, or members adapted to be torn-off, to provide pouring openings B65D 5/70)
- 5/56 • • Linings or internal coatings
- 5/58 • • • Linings spaced appreciably from container wall
- 5/60 • • • Loose linings
- 5/62 • • External coverings or coatings
- 5/63 • • having two or more separate access openings (contents-dispensing means B65D 5/72) [6]
- 5/64 • • Lids
- 5/66 • • • Hinged lids (B65D 5/34 takes precedence)
- 5/68 • • • Telescope flanged lids
- 5/70 • • Break-in flaps, or members adapted to be torn-off, to provide pouring openings (B65D 5/74 takes precedence)
- 5/72 • • Contents-dispensing means
- 5/74 • • • Spouts
- 5/76 • • • for discharging metered quantities
- 6/00 Containers having bodies formed by interconnecting or uniting two or more rigid, or substantially rigid, components made wholly or mainly of metal, plastics, wood or substitutes therefor** (containers having a curved cross-section B65D 8/00; specially constructed to be opened by cutting, piercing, or tearing of wall portions B65D 17/00; pallets B65D 19/00) [3]
- 6/02 • characterised by shape [3]
- 6/04 • • Trays or like containers without lids [3]
- 6/06 • • of drawer-and-shell type [3]
- 6/08 • of skeleton or like apertured construction, e.g. made of interwoven or intermeshing flexible material [3]
- 6/10 • with walls comprising multiple panels in spaced face-to-face relationship, e.g. double walls [3]
- 6/12 • • with walls, e.g. bottoms, movable under influence of contents [3]
- 6/14 • with walls comprising laminated panels, e.g. plywood [3]
- 6/16 • collapsible [3]
- 6/18 • • with hinged components [3]
- 6/20 • • • bound by flexible wire, or strip-like, elements [3]
- 6/22 • • • and detachable components [3]
- 6/24 • • with detachable components (B65D 6/22 takes precedence) [3]
- 6/26 • • Devices for holding collapsible containers in erected state [3]
- 6/28 • with permanent connections between walls, e.g. corner connections [3]
- 6/30 • • formed by rolling or by rolling and pressing [3]
- 6/32 • • formed by soldering, welding, or otherwise uniting opposed surfaces [3]
- 6/34 • Reinforcing or strengthening parts or members [3]
- 6/36 • • Battens, bands, strips or fittings [3]
- 6/38 • • Deformations, e.g. corrugations [3]
- 6/40 • with walls formed with filling or emptying apertures [3]
- 8/00 Containers having a curved cross-section formed by interconnecting or uniting two or more rigid, or substantially rigid, components made wholly or mainly of metal, plastics, wood or substitutes therefor** (specially constructed to be opened by cutting, piercing, or tearing of wall portions B65D 17/00; pallets B65D 19/00) [3]
- 8/02 • Arrangements of filling or discharging apertures [3]
- 8/04 • characterised by wall construction or by connection between walls [3]
- 8/06 • • with multiple walls in spaced face-to-face relationship, e.g. double walls [3]
- 8/08 • • Reinforcing or strengthening parts or members [3]
- 8/10 • • • Battens, bands, strips or fittings [3]
- 8/12 • • Deformations, e.g. corrugations [3]
- 8/14 • • collapsible [3]
- 8/16 • • with walls comprising laminated panels, e.g. plywood [3]
- 8/18 • • with permanent connections between walls [3]
- 8/20 • • • formed by rolling or by rolling and pressing [3]
- 8/22 • • • formed by soldering, welding, or otherwise uniting opposed surfaces (B65D 8/20 takes precedence) [3]
- 13/00 Containers having bodies formed by interconnecting two or more rigid, or substantially rigid, components made wholly or mainly of the same material, other than metal, plastics, wood, or substitutes therefor** (pallets B65D 19/00) [4]
- 13/02 • of glass, pottery, or other ceramic material
- 17/00 Rigid or semi-rigid containers specially constructed to be opened by cutting or piercing, or by tearing of frangible member or portion** (opening arrangements or devices for containers made by winding, bending or folding paper B65D 3/00, B65D 5/00; frangible inner closure members associated with caps, lids or covers B65D 51/20; opening devices added or incorporated during filling or closing of containers B65D 77/30; separate devices for opening closed containers B67B 7/00)
- 17/28 • about line or point of weakness [3]
- 17/30 • • using cutting device [3]

- 17/32 • • having non-detachable member or portion [3]
- 17/34 • • Arrangement or construction of pull or lift tab (B65D 17/32 takes precedence) [3]
- 17/347 • • • characterised by the connection between the tab and a detachable member or portion of the container [6]
- 17/353 • • • • the connecting means being integral with the tab or with the detachable member or portion [6]
- 17/36 • • • adapted for engagement with opening tool, e.g. slotted key (attachments of opening tools, e.g. slotted keys, to containers B65D 17/52) [3]
- 17/38 • • • • with strip or tool guide [3]
- 17/40 • • characterised having the line of weakness extending circumferentially of the container mouth [3]
- 17/42 • with cutting, punching, or cutter accommodating means (about line or point of weakness B65D 17/28) [3]
- 17/44 • • puncturing tool serves as closure [3]
- 17/46 • • Wire, string or like, e.g. rip cord [3]
- 17/48 • • • located in the seam-adjointing parts of the container [3]
- 17/50 • Non-integral frangible members applied to, or inserted in, a preformed opening, e.g. tearable strips, plastic plugs (B65D 53/08 takes precedence) [3]
- 17/52 • Attachments of opening tools, e.g., slotted keys, to containers [3]

- 19/00 Pallets or like platforms, with or without side walls, for supporting loads to be lifted or lowered** (in devices for lifting or lowering bulky or heavy goods for loading or unloading purposes B66F 9/12)
- 19/02 • Rigid pallets with side walls, e.g. box pallets
  - 19/04 • • with bodies moulded or otherwise fabricated in one piece
  - 19/06 • • with bodies formed by uniting or interconnecting two or more components
  - 19/08 • • • made wholly or mainly of metal
  - 19/10 • • • • of skeleton construction, e.g. made of wire
  - 19/12 • • • • Collapsible pallets
  - 19/14 • • • made wholly or mainly of wood
  - 19/16 • • • • Collapsible pallets
  - 19/18 • • • made wholly or mainly of plastics material
  - 19/20 • • • made wholly or mainly of paper
  - 19/22 • Rigid pallets without side walls
  - 19/24 • • with bodies moulded or otherwise fabricated in one piece
  - 19/26 • • with bodies formed by uniting or interconnecting two or more components
  - 19/28 • • • made wholly or mainly of metal
  - 19/30 • • • • of skeleton construction, e.g. made of wire
  - 19/31 • • • made wholly or mainly of wood [4]
  - 19/32 • • • made wholly or mainly of plastics material
  - 19/34 • • • made wholly or mainly of paper
  - 19/36 • Pallets comprising a flexible load carrier extending between guide elements, e.g. guide tubes
  - 19/38 • Details or accessories
  - 19/40 • • Elements for spacing platforms from supporting surface
  - 19/42 • • • Arrangements or applications of rollers or wheels
  - 19/44 • • Elements or devices for locating articles on platforms

**21/00 Nestable, stackable or joinable containers; Containers of variable capacity**

- 21/02 • Containers specially shaped, or provided with fittings or attachments, to facilitate nesting, stacking, or joining together [5]
- 21/024 • • for stacking containers lying on their sides, or for joining containers side-by-side, by means which are lateral with respect to the normal orientation of the containers [6]
- 21/028 • • • with interconnecting means forming part of the containers, e.g. dovetails, snap connectors, hook elements [6]
- 21/032 • • for stacking containers one upon another in the upright or upside down position, e.g. with vertically projecting elements or recesses [6]
- 21/036 • • • having closure means specially adapted for facilitating stacking [6]
- 21/04 • • Open-ended containers shaped to be nested when empty and to be superposed when full
- 21/06 • • with movable parts adapted to be placed in alternative positions for nesting the containers when empty and for stacking them when full
- 21/08 • Containers of variable capacity (containers of polygonal cross-section adapted to be of variable capacity formed by folding or erecting blanks made of paper B65D 5/355)

**Details of rigid or semi-rigid containers not otherwise provided for [3]**

**23/00 Details of bottles or jars not otherwise provided for** (closure-securing elements B65D 45/00)

- 23/02 • Linings or internal coatings
- 23/04 • Means for mixing or for promoting flow of contents (hydrodynamic means for influencing the flow of liquids F15D)
- 23/06 • Integral drip catchers or drip-preventing means
- 23/08 • Coverings or external coatings (wrappers B65D 65/00)
- 23/10 • Handles
- 23/12 • Means for the attachment of smaller articles
- 23/14 • • of tags
- 23/16 • • of thermometers (feeding bottles with thermometers A61J 9/02)

**25/00 Details of other kinds or types of rigid or semi-rigid containers**

- 25/02 • Internal fittings (of containers made by folding or erecting blanks made of paper B65D 5/44)
- 25/04 • • Partitions
- 25/06 • • • adapted to be fitted in two or more alternative positions
- 25/08 • • • with provisions for removing or destroying, e.g. to facilitate mixing of contents
- 25/10 • • Devices to locate articles in containers
- 25/14 • Linings or internal coatings (of containers made by folding or erecting blanks made of paper B65D 5/56)
- 25/16 • • Loose, or loosely-attached, linings
- 25/18 • • spaced appreciably from container wall
- 25/20 • External fittings (of containers made by folding or erecting blanks made of paper B65D 5/44)
- 25/22 • • for facilitating lifting or suspending of containers
- 25/24 • • for spacing bases of containers from supporting surfaces, e.g. legs (for pallets B65D 19/40)
- 25/26 • • Devices for protecting contents against shock

- 25/28 • Handles (of containers made by folding or erecting blanks made of paper B65D 5/46; of bottles or jars B65D 23/10)
- 25/30 • • Hand holes
- 25/32 • • Bail handles, i.e. pivoted handles of generally semi-circular shape
- 25/34 • Coverings or external coatings (of containers made by folding or erecting blanks made of paper B65D 5/62; for bottles or jars B65D 23/08; wrappers B65D 65/00)
- 25/36 • • formed by applying sheet material
- 25/38 • Devices for discharging contents (incorporated in removable or non-permanently-secured closure members B65D 47/00; for discharging thin flat articles B65D 83/08)
- 25/40 • • Nozzles or spouts (in general B05B)
- 25/42 • • • Integral or attached nozzles or spouts
- 25/44 • • • • Telescopic or retractable nozzles or spouts
- 25/46 • • • • Hinged or pivoted nozzles or spouts
- 25/48 • • • Separable nozzles or spouts
- 25/50 • • • • arranged to be plugged in two alternate positions
- 25/52 • • Devices for discharging successive articles or portions of contents
- 25/54 • Inspection openings or windows
- 25/56 • • with means for indicating level of contents
- 30/08 • • with laminated or multiple walls in spaced face-to-face relationship, e.g. double walls (B65D 30/14, B65D 30/26 take precedence; with shock-absorbing properties B65D 81/03) [3]
- 30/10 • characterised by shape or construction [3]
- 30/12 • • Cross bottom bags [3]
- 30/14 • • • multi-layered [3]
- 30/16 • • with rigid end walls, e.g. free standing bags [3]
- 30/18 • • with block bottoms [3]
- 30/20 • • with folds, e.g. to facilitate collapsing [3]
- 30/22 • • with two or more compartments [3]
- 30/24 • • Bags having valves [3]
- 30/26 • • • multi-layered [3]
- 30/28 • • Triangular- or conical-shaped bags [3]

### 33/00 Details of, or accessories for, sacks or bags

- 33/01 • Ventilation or draining of bags [3]
- 33/02 • Local reinforcements or stiffening inserts, e.g. wires, strings, strips, frames
- 33/04 • Windows or other apertures, e.g. for viewing contents
- 33/06 • Handles
- 33/08 • • Hand holes
- 33/10 • • formed of similar material to that used for the bag
- 33/12 • • String handles
- 33/14 • Suspension means (handles B65D 33/06)
- 33/16 • End- or aperture-closing arrangements or devices (valves of valve bags B65D 30/24; removable stoppers or caps B65D 39/00, B65D 41/00; closures of filled bags B65D 77/10; closing filled bags in association with packaging B65B 7/00, B65B 51/00)
- 33/17 • • with brackets, rings or locks [4]
- 33/18 • • using adhesive applied to integral parts, e.g. to flaps (of envelopes B65D 27/14)
- 33/20 • • • using pressure-sensitive adhesive
- 33/22 • • • using heat-activatable adhesive
- 33/24 • • using self-locking integral or attached closure elements, e.g. flaps (B65D 33/25 takes precedence) [4]
- 33/25 • • Riveting; Dovetailing; Screwing; using press buttons or slide fasteners [4]
- 33/26 • • using staples or stitches
- 33/28 • • Strings or strip-like closures [4]
- 33/30 • • Deformable or resilient metal or like strips or bands
- 33/32 • • Metallic chain closures
- 33/34 • • with special means for indicating unauthorised opening
- 33/36 • Means for discharging contents
- 33/38 • • Spouts

### 35/00 Pliable tubular containers adapted to be permanently deformed to expel contents, e.g. collapsible tubes for toothpaste or other plastic or semi-liquid material; Holders therefor

- 35/02 • Body construction
- 35/04 • • made in one piece
- 35/06 • • • from metallic material
- 35/08 • • • from plastics material
- 35/10 • • made by uniting or interconnecting two or more components
- 35/12 • • Connections between body and closure-receiving bush
- 35/14 • with linings or inserts
- 35/16 • • for minimising or preventing corrosion of body
- 35/18 • • for keeping body in rolled state after partial expulsion of contents

### General kinds of flexible containers [3]

- 27/00 **Envelopes or like essentially-rectangular flexible containers for postal or other purposes having no structural provision for thickness of contents** (with shock-absorbing properties B65D 81/03; letter-cards B42D 15/00)
- 27/02 • with stiffening inserts
- 27/04 • with apertures or windows for viewing contents
- 27/06 • with provisions for repeated re-use
- 27/08 • with two or more compartments
- 27/10 • Chains of interconnected envelopes
- 27/12 • Closures (separate fasteners B42F 1/00)
- 27/14 • • using adhesive applied to integral parts, e.g. flaps
- 27/16 • • • using pressure-sensitive adhesive
- 27/18 • • • using heat-activatable adhesive
- 27/20 • • using self-locking integral or attached elements
- 27/22 • • • Tongue-and-slot or like closures; Tuck-in flaps
- 27/24 • • • String closures
- 27/26 • • • Deformable metallic elements
- 27/28 • • Applications of separate closing elements
- 27/30 • • with special means for indicating unauthorised opening
- 27/32 • Opening devices incorporated during envelope manufacture (incorporated during closing of envelope B43M 5/00; separate devices for opening envelopes B43M 7/00)
- 27/34 • • Lines of weakness
- 27/36 • • Finger openings, slots, or gripping tabs
- 27/38 • • Tearing-strings or -strips
- 30/00 **Sacks, bags or like containers [3]**
- 30/02 • characterised by the material used [3]
- 30/04 • • made of fabric [3]
- 30/06 • • • net-like [3]

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- 35/20 • • for retracting contents
- 35/22 • with two or more compartments
- 35/24 • with auxiliary devices (linings or inserts B65D 35/14)
- 35/26 • • for filling
- 35/28 • • for expelling contents
- 35/30 • • • Pistons
- 35/32 • • Winding keys
- 35/34 • • • connected to, or associated with, tube holders
- 35/36 • • for applying contents to surfaces (brushes combined or associated with tubular containers A46B 11/00)
- 35/38 • • • Nozzles
- 35/40 • • for metering discharge
- 35/42 • • for preventing loss of removable closure members
- 35/44 • Closures (closure members of interest apart from this application B65D 39/00-B65D 55/00; forming bottom closures after filling B65B 7/14)
- 35/46 • • with valves (bureau accessories for applying liquids, e.g. adhesive, B43M 11/00)
- 35/48 • • • Hand-operated valves
- 35/50 • • • opening when tubular containers is deformed
- 35/52 • • • Slits
- 35/54 • • • opening when closure is pressed against a surface to which contents are applied (nozzles B65D 35/38)
- 35/56 • Holders for collapsible tubes
- 37/00 Portable flexible containers not otherwise provided for**

**Closure members, other than those folded of paper and incorporated in or attached to the container, for opening of rigid or semi-rigid containers without destroying outer wall portions of the container itself, or of flexible containers presenting similar closing problems; Arrangements or devices for preventing refilling of containers; Parts of containers co-operating with closure members or characterised by the form of closure members [3]**

- 39/00 Closures arranged within necks or pouring openings or in discharge apertures, e.g. stoppers** (lids or covers B65D 43/00; with additional securing elements B65D 45/00)
- 39/02 • Disc closures (discs with flanges B65D 39/04)
- 39/04 • Cup-shaped plugs or like hollow flanged members
- 39/06 • Balls
- 39/08 • Threaded or like closure members secured by rotation; Bushes therefor
- 39/10 • • with bayonet cams
- 39/12 • expandable, e.g. inflatable
- 39/14 • extending through lateral openings in necks
- 39/16 • with handles or other special means facilitating manual actuation
- 39/18 • with anti-friction or wear-resistant coatings or coverings
- 41/00 Caps, e.g. crown caps, crown seals, i.e. members having parts arranged for engagement with the external periphery of a neck or wall defining a pouring opening or discharge aperture; Protective cap-like covers for closure members, e.g. decorative covers of metal foil or paper** (B65D 45/00 takes precedence; combinations of caps and protective cap-like covers B65D 51/18; making closures by working metal sheet B21D 51/44)
- 41/01 • specially adapted for accommodating plural sizes [6]

- 41/02 • Caps or cap-like covers without lines of weakness, tearing strips, tags, or like opening or removal devices
- 41/04 • • Threaded or like caps or cap-like covers secured by rotation
- 41/06 • • • with bayonet cams
- 41/08 • • • engaging a threaded ring clamped on the external periphery of the neck or wall
- 41/10 • • Caps or cap-like covers adapted to be secured in position by permanent deformation of the wall-engaging parts
- 41/12 • • • made of relatively-stiff metallic materials, e.g. crown caps
- 41/14 • • • made of metallic foil or like thin flexible material
- 41/16 • • Snap-on caps or cap-like covers
- 41/17 • • • push-on and twist-off [6]
- 41/18 • • • non-metallic, e.g. made of paper or plastics
- 41/20 • • Caps or cap-like covers with membranes, e.g. arranged to be pierced
- 41/22 • • Caps or cap-like covers with elastic parts adapted to be stretched over the container
- 41/24 • • Caps or cap-like covers made of shrinkable material or formed in situ by dipping, e.g. using gelatine or celluloid
- 41/26 • • Caps or cap-like covers serving as, or incorporating, drinking or measuring vessels
- 41/28 • • Caps combined with stoppers
- 41/30 • • • Deformable caps combined with resilient stoppers to permit re-use as temporary closures
- 41/32 • Caps or cap-like covers with lines of weakness, tearing-strips, tags, or like opening or removal devices, e.g. to facilitate formation of pouring openings
- 41/34 • • Threaded or like caps or cap-like covers
- 41/36 • • • with bayonet cams
- 41/38 • • • engaging a threaded ring clamped on the external periphery of the neck or wall
- 41/40 • • Caps or cap-like covers adapted to be secured in position by permanent deformation of the wall-engaging parts
- 41/42 • • • made of relatively-stiff metallic material, e.g. crown caps
- 41/44 • • • made of metallic foil or like thin flexible material
- 41/46 • • Snap-on caps or cap-like covers
- 41/47 • • • push-on and twist-off [6]
- 41/48 • • • non-metallic, e.g. made of paper, plastics
- 41/50 • • Caps or cap-like covers with membranes, e.g. arranged to be pierced
- 41/52 • • Caps or cap-like covers with elastic parts adapted to be stretched over the container
- 41/54 • • Caps or cap-like covers made of shrinkable material or formed in situ by dipping, e.g. using gelatine, celluloid
- 41/56 • • Caps or cap-like covers serving as, or incorporating, drinking or measuring vessels
- 41/58 • • Caps or cap-like covers combined with stoppers
- 41/60 • • • Deformable caps combined with resilient stoppers to permit re-use as temporary closures
- 41/62 • Secondary protective cap-like outer covers for closure members (arrangements of closures with protective outer cap-like covers or of two or more co-operating closures B65D 51/18)



- 43/00 Lids or covers for rigid or semi-rigid containers** (for cooking vessels A47J 36/06; covers for pressure vessels in general F16J 13/00)
- 43/02 • Removable lids or covers (with means for piercing, cutting, or tearing a frangible inner closure B65D 51/22)
- 43/03 • • nestable or stackable (nestable or stackable containers B65D 21/00) [3]
- 43/04 • • having a part, or parts, engaging within the mouth of the container and retained by friction or gravity
- 43/06 • • having a peripheral channel embracing the rim of the container
- 43/08 • • having a peripheral flange fitting over the rim of the container
- 43/10 • • • and retained by snapping over beads or projections
- 43/12 • • guided for removal by sliding
- 43/14 • Non-removable lids or covers
- 43/16 • • hinged for upward or downward movement (hinges of door or similar type E05D)
- 43/18 • • pivoted for movement in plane of container mouth
- 43/20 • • linearly slidable
- 43/22 • • Devices for holding in closed position, e.g. clips [4]
- 43/24 • • Devices for retaining in open position
- 43/26 • Mechanisms for opening or closing, e.g. pedal-operated
- 45/00 Clamping or other pressure-applying devices for securing or retaining closure members** (screw-threaded or bayonet connections between stoppers or caps and containers B65D 39/08, B65D 41/04, B65D 41/34; expansible stoppers B65D 39/12; for pressure vessels in general F16J 13/00)
- 45/02 • for applying axial pressure to engage closure with sealing surface
- 45/04 • • comprising U-shaped or bifurcated members coacting with containers, e.g. pivoted bails
- 45/06 • • • associated with toggle levers, e.g. swing stopper arrangements (forming levers or links by working wire B21F 45/04)
- 45/08 • • • incorporating springs
- 45/10 • • • incorporating tightening screws
- 45/12 • • • associated with locking levers engaging rack teeth for varying the applied pressure
- 45/14 • • • coacting with inclined grooves in container wall for varying the applied pressure
- 45/16 • • Clips, hooks, or clamps, e.g. C-shaped (U-shaped or bifurcated members B65D 45/04)
- 45/18 • • • of snap-over type
- 45/20 • • • pivoted
- 45/22 • • • resilient
- 45/24 • • • incorporating pressure-applying means, e.g. screws, toggles
- 45/26 • • • incorporating tensioning chains
- 45/28 • • Elongated members, e.g. leaf springs, located substantially at right angles to closure axis and acting between the face of the closure and abutments on container
- 45/30 • • Annular members, e.g. with snap-over action, screw-threaded
- 45/32 • for applying radial pressure, e.g. contractible bands encircling closure member
- 45/34 • • lever-operated
- 47/00 Closures with filling and discharging, or with discharging, devices** (dispensers for liquid soap A47K 5/12; desk equipment for applying liquid by contact with surfaces B43M 11/00)
- 47/02 • for initially filling and for preventing subsequent refilling
- 47/04 • Closures with discharging devices other than pumps
- 47/06 • • with pouring spouts or tubes; with discharge nozzles or passages (with slidable spouts B65D 47/26)
- 47/08 • • • having articulated or hinged closures
- 47/10 • • • having frangible closures
- 47/12 • • • having removable closures
- 47/14 • • • • and closure-retaining means
- 47/16 • • • with closures operating automatically when spout is immersed in discharged liquid
- 47/18 • • • for discharging drops; Droppers
- 47/20 • • comprising hand-operated members for controlling discharge (B65D 47/34 takes precedence)
- 47/22 • • • operating with pinching action on flexible tubes
- 47/24 • • • with poppet valves
- 47/26 • • • with slide valves, e.g. formed with slidable spouts
- 47/28 • • • • having linear movement
- 47/30 • • • with plug valves
- 47/32 • • with means for venting [3]
- 47/34 • Closures with discharge by pumping
- 47/36 • Closures with frangible parts adapted to be pierced, torn, or removed, to provide discharge openings (B65D 51/18 takes precedence; caps with pierceable membranes B65D 41/20, B65D 41/50)
- 47/38 • • with piercing means arranged to act subsequently as a valve to control the opening
- 47/40 • with drip catchers or drip-preventing means
- 47/42 • with pads or like contents-applying means (brushes combined or associated with containers A46B 11/00; swabs for applying media to the human body from an integral supply A61F 13/40)
- 47/44 • • combined with slits opening when container is deformed or when pad is pressed against surface to which contents are to be applied (pliable tubular containers with valves opening when closure is pressed against surface B65D 35/54)
- 49/00 Arrangements or devices for preventing refilling of containers** (integral, or permanently secured, closures for containers specially adapted to be opened by cutting, piercing, or tearing of wall portions B65D 17/00; for initial filling and for preventing subsequent refilling B65D 47/02)
- 49/02 • One-way valves
- 49/04 • • Weighted valves
- 49/06 • • • with additional loading weights
- 49/08 • • Spring-loaded valves
- 49/10 • • Arrangements of several valves
- 49/12 • by destroying, in the act of opening the container, an integral portion thereof
- 50/00 Closures with means for discouraging unauthorised opening or removal thereof, with or without indicating means, e.g. child-proof closures** (tamper-indicating closures without means for discouraging, see the relevant groups, e.g. B65D 41/32, B65D 51/20; means per se for discouraging or indicating unauthorised opening or removal of closure B65D 55/02) [5]

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- 50/02 • openable or removable by the combination of plural actions [5]
- 50/04 • • requiring the combination of simultaneous actions, e.g. depress and turn, lift and turn, maintain a part and turn another one (B65D 50/10 takes precedence; caps or covers secured by rotation with bayonet cams B65D 41/06, B65D 41/36) [5]
- 50/06 • • requiring the combination of different actions in succession (B65D 50/10 takes precedence) [5]
- 50/08 • • openable or removable by closure or container deformation [5]
- 50/10 • • disengageable only after alignment of closure parts with container [5]
- 50/12 • Disguised or hidden forms of closures, e.g. dummy closure in association with removable closure forming container base (bottles or similar containers with closable apertures at bottom B65D 1/06) [5]
- 50/14 • openable or removable only by means of special opening member (containers with cutting, punching, or cutter accommodating means B65D 17/42; key-actuated closure locks B65D 55/14) [5]

### 51/00 Closures not otherwise provided for (covers or similar closures as engineering elements for pressure vessels in general F16J 13/00)

- 51/02 • Loosely-engaging lids or covers for jars, cans, or like containers for liquids without means for effecting sealing of container (for cooking-vessels A47J 36/06)
- 51/04 • • hinged (B65D 51/10 takes precedence)
- 51/06 • • collapsible
- 51/08 • • with axial projections fitting within, or around, the walls defining the container openings, e.g. for milk churns
- 51/10 • • opening automatically when container is tilted for pouring
- 51/12 • • Flexible non-elastic covers
- 51/14 • Rigid discs or spherical members adapted to be held in sealing engagement with mouth of container, e.g. closure plates for preserving jars
- 51/16 • with means for venting air or gas
- 51/18 • Arrangements of closures with protective outer cap-like covers or of two or more co-operating closures (secondary protective cap-like outer covers for caps B65D 41/62)
- 51/20 • • Caps, lids, or covers co-operating with an inner closure arranged to be opened by piercing, cutting, or tearing
- 51/22 • • • having means for piercing, cutting, or tearing the inner closure
- 51/24 • combined with auxiliary devices for non-closing purposes
- 51/26 • • with means for keeping contents in position, e.g. resilient means
- 51/28 • • with auxiliary containers for additional articles or materials
- 51/30 • • • for desiccators
- 51/32 • • with brushes or rods for applying or stirring contents (droppers B65D 47/18)

### 53/00 Sealing or packing elements; Sealings formed by liquid or plastic material

- 53/02 • Collars or rings
- 53/04 • Discs
- 53/06 • Sealings formed by liquid or plastic material
- 53/08 • Flexible adhesive strips adapted to seal filling or discharging apertures
- 53/10 • characterised by special adaptation to acid-proof vessels

### 55/00 Accessories for container closures not otherwise provided for

- 55/02 • Locking devices; Means for discouraging or indicating unauthorised opening or removal of closure (protective covers for bottles B65D 23/08; protective cap-like outer covers for bottle or jar closures B65D 41/28; pressure-applying means B65D 45/00; closures with means for discouraging unauthorised opening or removal of closures B65D 50/00) [5]
- 55/04 • • Spring clips, e.g. of wire, of sheet metal
- 55/06 • • Deformable or tearable wires, strings, or strips (containers specially constructed to be opened by tear-strips, strings or the like B65D 17/00; caps or cap-like closures with tear-strips B65D 41/32); Use of seals (applying labels to bottles B65C 3/06, B65C 9/00)
- 55/08 • • • Annular elements encircling container necks
- 55/10 • • Locking pins
- 55/12 • • Devices or means with relatively-moving parts co-operating with abutments on bottle or jar (applications of locks B65D 55/14)
- 55/14 • • Applications of locks, e.g. of permutation or key-controlled locks
- 55/16 • Devices preventing loss of removable closure members

## Kinds or types of packaging elements

### 57/00 Internal frames or supports for flexible articles, e.g. stiffeners; Separators for articles packaged in stacks or groups, e.g. for preventing adhesion of sticky articles

### 59/00 Plugs, sleeves, caps, or like rigid or semi-rigid elements for protecting parts of articles or for bundling articles, e.g. protectors for screw-threads, corner protectors, end caps for tubes or for bundling rod-shaped articles

- 59/02 • Plugs
- 59/04 • Sleeves, e.g. postal tubes
- 59/06 • Caps
- 59/08 • • of polygonal cross-section

### 61/00 External frames or supports adapted to be assembled around, or applied to, articles (collapsible containers B65D 5/00, B65D 6/16, B65D 6/24, B65D 8/14)

- 61/02 • Tubular frames with resilient joints

### 63/00 Flexible elongated elements, e.g. straps, for bundling or supporting articles

- 63/02 • Metallic straps, tapes, or bands; Joints between ends thereof
- 63/04 • • Joints produced by deformation of ends of elements
- 63/06 • • Joints produced by application of separate securing members, e.g. by deformation thereof
- 63/08 • • • Joints using buckles, wedges, or like locking members attached to the ends of the elements
- 63/10 • Non-metallic straps, tapes, or bands; Filamentary elements, e.g. strings, threads, wires; Joints between ends thereof
- 63/12 • • Joints produced by deformation or tying of ends of elements
- 63/14 • • Joints produced by application of separate securing members
- 63/16 • • • Joints using buckles, wedges, or like locking members attached to the end of the element

- 63/18 • Elements provided with handles or other suspension means

**65/00 Wrappers or flexible covers; Packaging materials of special type or form** (wrappers or envelopes with shock-absorbing properties B65D 81/03)

**Note(s)**

Attention is drawn to the definition of "packaging elements" in Note (5) following the title of this subclass.

- 65/02 • Wrappers or flexible covers
- 65/04 • • non-rectangular
- 65/06 • • • formed with foldable flaps, e.g. interlocking flaps
- 65/08 • • • with fastening elements, e.g. slide fasteners
- 65/10 • • rectangular
- 65/12 • • • formed with crease lines to facilitate folding
- 65/14 • • with areas coated with adhesive
- 65/16 • • with provision for excluding or admitting light
- 65/18 • • • with some areas transparent and others opaque
- 65/20 • • • with provision for excluding light of a particular wavelength
- 65/22 • • Details
- 65/24 • • • Tabs or other projections for locating contents
- 65/26 • • • Opening devices
- 65/28 • • • • Perforations or lines of weakness
- 65/30 • • • • Slits, slots, or cuts
- 65/32 • • • • Tabs or like projections for gripping by the fingers
- 65/34 • • • • Attached tearing-strings or like flexible elements
- 65/36 • • • • Reinforcements to guide tearing
- 65/38 • Packaging materials of special type or form
- 65/40 • • Applications of laminates for particular packaging purposes
- 65/42 • • Applications of coated or impregnated materials
- 65/46 • • Applications of disintegrable, dissolvable or edible materials [3]
- 67/00 Kinds or types of packaging elements not otherwise provided for**
- 67/02 • Clips or clamps for holding articles together for convenience of storage or transport

**Kinds or types of packages**

**69/00 Articles joined together for convenience of storage or transport without the use of packaging elements** (joining articles for convenience of packaging B65B 17/02)

**71/00 Bundles of articles held together by packaging elements for convenience of storage or transport, e.g. portable segregating carrier for plural receptacles such as beer cans, pop bottles; Bales of material** (binding of hay or straw A01D, A01F 1/00; bundling or baling B65B, e.g. B65B 13/00, B65B 27/00)

- 71/02 • Arrangements of flexible binders
- 71/04 • • with protecting or supporting elements arranged between binder and articles or materials, e.g. for preventing chafing of binder
- 71/06 • comprising a plurality of articles completely or mainly held together by packaging elements, e.g. under tension [3]
- 71/08 • • Wrappers shrunk by heat [3]

- 71/10 • • • and provided with inserts [5]
- 71/12 • • the packaging elements being formed by folding a single blank [5]
- 71/14 • • • having the shape of a tube, without, or not being characterised by, end walls (sleeves B65D 59/04) [5]
- 71/16 • • • • with article-locating elements (B65D 71/24 takes precedence) [5]
- 71/18 • • • • • Tabs inwardly folded from upper or lower wall [5]
- 71/20 • • • • • Slits or openings along the foldline of the tubular body [5]
- 71/22 • • • • • Openings formed in the sidewall [5]
- 71/24 • • • • with partitions [5]
- 71/26 • • • • • extending from upper or lower wall [5]
- 71/28 • • • • characterised by the handle [5]
- 71/30 • • • • • unitary with the tubular packaging elements (B65D 71/32 takes precedence) [5]
- 71/32 • • • • • formed by finger-holes [5]
- 71/34 • • • • characterised by lines of weakness or the like [5]
- 71/36 • • • characterised by having end walls [5]
- 71/38 • • the packaging elements being formed by folding and interconnecting two or more blanks [5]
- 71/40 • comprising a plurality of articles held together only partially by packaging elements formed by folding a blank [5]
- 71/42 • • formed by folding a single blank into a single layer element [5]
- 71/44 • • • characterised by the handle [5]
- 71/46 • • formed by folding a single blank into a tubular element [5]
- 71/48 • • • characterised by the handle [5]
- 71/50 • comprising a plurality of articles held together only partially by packaging elements formed otherwise than by folding a blank [5]
- 71/52 • Tray-like packaging elements provided with handles for storage or transport of a plurality of articles (B65D 71/12, B65D 71/38, B65D 71/40, B65D 71/50 take precedence) [5]
- 71/54 • • without partitions (B65D 71/60, B65D 71/68 take precedence) [5]
- 71/56 • • with a single longitudinal partition (B65D 71/60, B65D 71/68 take precedence) [5]
- 71/58 • • formed by folding one blank and having vertical partitions (B65D 71/60 takes precedence) [5]
- 71/60 • • formed by folding one blank into a tubular element, having upper wall portions provided with openings, through which the articles extend [5]
- 71/62 • • • with parts of the walls bent against one another to form a longitudinal partition between two rows of articles (B65D 71/64, B65D 71/66 take precedence) [5]
- 71/64 • • • with walls enclosing the articles almost completely (B65D 71/66 takes precedence) [5]
- 71/66 • • • for holding only one row of articles [5]
- 71/68 • • formed by folding and interconnecting two or more blanks (B65D 71/72 takes precedence) [5]
- 71/70 • Trays provided with projections or recesses in order to assemble multiple articles, e.g. intermediate elements for stacking [5]
- 71/72 • • formed by folding one or more blanks, the articles being inserted in openings in a wall [5]

- 73/00 Packages comprising articles attached to cards, sheets, or webs** (cards for buttons, collar-studs, or sleeve-links A44B 7/00; attaching articles to cards, sheets, or webs B65B 15/00)
- 73/02 • Articles, e.g. small electrical components, attached to webs
- 75/00 Packages comprising articles or materials partially or wholly enclosed in strips, sheets, blanks, tubes, or webs of flexible sheet material, e.g. in folded wrappers** (B65D 71/00 takes precedence; wrapping B65B 11/00) [5]
- 75/02 • Articles partially enclosed in folded or wound strips or sheets, e.g. wrapped newspapers
- 75/04 • Articles or materials wholly enclosed in single sheets or wrapper blanks
- 75/06 • • in sheets or blanks initially folded to form tubes
- 75/08 • • • with the ends of the tube closed by folding
- 75/10 • • • with the ends of the tube closed by twisting
- 75/12 • • • with the ends of the tube closed by flattening and heat-sealing
- 75/14 • • in sheets or blanks folded-up around all sides of the contents from a portion on which the contents are placed
- 75/16 • • • the upstanding portion of the wrapper being closed by twisting
- 75/18 • • • the upstanding portion of the wrapper being closed by regular or irregular folds or pleats, e.g. bunch-wrapped packages
- 75/20 • • in sheets or blanks doubled around contents and having their opposed free margins united, e.g. by pressure-sensitive adhesive, crimping, heat-sealing, or welding
- 75/22 • • • the sheet or blank being recessed to accommodate contents
- 75/24 • • • • and formed with several recesses to accommodate a series of articles or quantities of material
- 75/26 • Articles or materials wholly enclosed in laminated sheets or wrapper blanks
- 75/28 • Articles or materials wholly enclosed in composite wrappers, i.e. wrappers formed by associating or interconnecting two or more sheets or blanks
- 75/30 • • Articles or materials enclosed between two opposed sheets or blanks having their margins united, e.g. by pressure-sensitive adhesive, crimping, heat-sealing, or welding
- 75/32 • • • one or both sheets or blanks being recessed to accommodate contents
- 75/34 • • • • and having several recesses to accommodate a series of articles or quantities of material
- 75/36 • • • • one sheet or blank being recessed and the other formed of relatively stiff flat sheet material, e.g. blister packages
- 75/38 • Articles or materials enclosed in two or more wrappers disposed one inside the other
- 75/40 • Packages formed by enclosing successive articles, or increments of material, in webs, e.g. folded or tubular webs, or by subdividing tubes filled with liquid, semi-liquid, or plastic materials
- 75/42 • • Chains of interconnected packages
- 75/44 • • Individual packages cut from webs or tubes
- 75/46 • • • containing articles
- 75/48 • • • containing liquids, semiliquids, or pastes, e.g. cushion-shaped packages
- 75/50 • • • • Tetrahedral packages
- 75/52 • Details
- 75/54 • • Cards, coupons, or other inserts or accessories (opening devices B65D 75/70)
- 75/56 • • • Handles or other suspension means
- 75/58 • • Opening or contents-removing devices added or incorporated during package manufacture
- 75/60 • • • Weakened closure seams
- 75/62 • • • Cuts or perforations, e.g. in closure seams
- 75/64 • • • Tabs formed by unsecured portion of wrapper
- 75/66 • • • Inserted or applied tearing-strings or like flexible elements
- 75/68 • • • • extending through wrapper closure or between wrapper layers
- 75/70 • • • Rigid cutting or tearing devices
- 77/00 Packages formed by enclosing articles or materials in preformed containers, e.g. boxes, cartons, sacks, bags**
- 77/02 • Wrapped articles enclosed in rigid or semi-rigid containers
- 77/04 • Articles or materials enclosed in two or more containers disposed one within another
- 77/06 • • Liquids or semiliquids enclosed in flexible containers disposed within rigid containers
- 77/08 • Materials, e.g. different materials, enclosed in separate compartments formed during filling of a single container
- 77/10 • Container closures formed after filling (closing filled containers in association with packaging B65B 7/00, B65B 51/00)
- 77/12 • • by collapsing and flattening the mouth portion of the container and securing without folding, e.g. by pressure-sensitive adhesive, heat-sealing, welding, applying a separate securing member
- 77/14 • • by flattening and subsequently folding or rolling the mouth portion
- 77/16 • • by collapsing and twisting mouth portion
- 77/18 • • • and securing by a deformable clip or binder
- 77/20 • • by applying separate lids or covers
- 77/22 • Details
- 77/24 • • Inserts or accessories added or incorporated during filling of containers (opening devices B65D 77/30)
- 77/26 • • • Elements or devices for locating or protecting articles
- 77/28 • • • Cards, coupons, or drinking straws
- 77/30 • • Opening or contents-removing devices added or incorporated during filling or closing of containers
- 77/32 • • • Tearing-strings or like flexible elements
- 77/34 • • • • enclosed in a mouth seal
- 77/36 • • • • disposed beneath a wrapper, label, or other element of sheet material securing a lid, cover, or container mouth
- 77/38 • • • Weakened closure seams
- 77/40 • • • Rigid cutting or tearing devices
- 79/00 Kinds or details of packages, not otherwise provided for**
- 79/02 • Arrangements or devices for indicating incorrect storage or transport

**Containers, packaging elements, or packages, of special types or forms or specially adapted for organisms, articles, or materials presenting particular transport, storage, or dispensing problems**

- 81/00 Containers, packaging elements, or packages, for contents presenting particular transport or storage problems, or adapted to be used for non-packaging purposes after removal of contents**
- 81/02 • specially adapted to protect contents from mechanical damage [6]
  - 81/03 • • Wrappers or envelopes with shock-absorbing properties, e.g. bubble films [6]
  - 81/05 • • maintaining contents at spaced relation from package walls, or from other contents (B65D 81/03 takes precedence) [6]
  - 81/07 • • • using resilient suspension means [6]
  - 81/09 • • • using flowable discrete elements of shock-absorbing material, e.g. pellets, popcorn [6]
  - 81/107 • • • using blocks of shock-absorbing material [6]
  - 81/113 • • • • of a shape specially adapted to accommodate contents [6]
  - 81/127 • • • using rigid or semi-rigid sheets of shock-absorbing material [6]
  - 81/133 • • • • of a shape specially adapted to accommodate contents, e.g. trays [6]
  - 81/15 • • • using liquids [6]
  - 81/17 • • specially adapted to crumple without damage to contents [6]
  - 81/18 • providing specific environment for contents, e.g. temperature above or below ambient (with thermal insulation B65D 81/38; ice-boxes with cooling means F25D) [6]
  - 81/20 • • under vacuum or superatmospheric pressure, or in a special atmosphere, e.g. of inert gas
  - 81/22 • • in moist conditions or immersed in liquids
  - 81/24 • Adaptations for preventing deterioration or decay of contents; Applications to the container or packaging material of food preservatives, fungicides, pesticides or animal repellants (with thermal insulation B65D 81/38) [6]
  - 81/26 • • with provision for draining away, or absorbing, fluids, e.g. exuded by contents; Applications of corrosion inhibitors or desiccators
  - 81/28 • • Applications of food preservatives, fungicides, pesticides, or animal repellants
  - 81/30 • • by excluding light or other outside radiation (wrappers B65D 65/16)
  - 81/32 • for packaging two or more different materials which must be maintained separate prior to use in admixture (containers with removable or destructible partitions B65D 25/08)
  - 81/34 • for packaging foodstuffs intended to be cooked or heated within the package [6]
  - 81/36 • adapted to be used for non-packaging purposes after removal of contents
  - 81/38 • with thermal insulation (vacuum bottles or the like A47J 41/00)

- 83/00 Containers or packages with special means for dispensing contents** (dispensing means incorporated in removable or non-permanently secured container closures B65D 47/00; for shops, stores, offices, bars, or the like A47F 1/04; showcases or show cabinets with dispensing arrangements A47F 3/02; magazines for screws or nuts in combination with spanners, wrenches or screwdrivers B25B 23/06; nail dispensers B25C 3/00; for use in connection with the handling of sheets, webs, or filamentary material B65H; coin deliverers G07D 1/00)
- 83/02 • for dispensing rod-shaped articles, e.g. needles (cigar or cigarette receptacles or boxes A24F 15/00)
  - 83/04 • for dispensing annular, disc-shaped, or spherical or like small articles, e.g. tablets, pills
  - 83/06 • for dispensing powdered or granular material
  - 83/08 • for dispensing thin flat articles in succession (dispensers for surgical scalpel blades A61B 17/3215)
  - 83/10 • • for dispensing razor-blades
  - 83/12 • • for dispensing tickets or tokens
  - 83/14 • for delivery of liquid or semi-liquid contents by internal gaseous pressure, i.e. aerosol containers
  - 83/16 • • characterised by the actuating means [5]
  - 83/18 • • • Container-carried hand lever [5]
  - 83/20 • • • Actuator cap [5]
  - 83/22 • • • with means to disable actuation (B65D 50/00 takes precedence) [5]
  - 83/24 • • • with means to hold valve open [5]
  - 83/26 • • • operating automatically, e.g. periodically [5]
  - 83/28 • • Nozzles, nozzle fittings or accessories specially adapted therefor [5]
  - 83/30 • • • for guiding the flow of spray [5]
  - 83/32 • • Dip-tubes [5]
  - 83/34 • • Cleaning or preventing clogging of the discharge passage [5]
  - 83/36 • • allowing operation in any orientation [5]
  - 83/38 • • Details of container body (pressure relief devices B65D 83/70) [5]
  - 83/40 • • Closure caps (actuator caps B65D 83/20) [5]
  - 83/42 • • Filling or charging means [5]
  - 83/44 • • Valves specially adapted therefor; Regulating devices (filling or discharging means B65D 83/42; pressure relief devices B65D 83/70) [5]
  - 83/46 • • • Tilt valves (B65D 83/50 takes precedence) [5]
  - 83/48 • • • Lift valves, e.g. operated by push action (B65D 83/50 takes precedence) [5]
  - 83/50 • • • Non-reclosable valves [5]
  - 83/52 • • • for metering [5]
  - 83/54 • • • • Metering valves [5]
  - 83/56 • • shut-off when inverted [5]
  - 83/58 • • Separate inlets for gas and material in duct to valve (B65D 83/60 takes precedence) [5]
  - 83/60 • • Product and propellant separated [5]
  - 83/62 • • • by membrane, bag, or the like [5]
  - 83/64 • • • by piston [5]
  - 83/66 • • • first separated, but finally mixed [5]
  - 83/68 • • Dispensing two or more products [5]
  - 83/70 • • Pressure relief devices [5]
  - 83/72 • • with heating or cooling devices [5]
  - 83/74 • • • heating by exothermic reaction [5]
  - 83/76 • for dispensing fluent material by means of a piston or the like (hand tools for discharging fluent material through an outlet orifice by pressure B05C 17/005) [5]

**85/00 Containers, packaging elements or packages, specially adapted for particular articles or materials** (B65D 71/00, B65D 83/00 take precedence; hand implements, travelling equipment A45C; cosmetic or toilet equipment A45D; packages for surgical knives, scalpels or blades therefor A61B 17/3215; containers specially adapted for medical or pharmaceutical purposes A61J 1/00; paint cans B44D 3/12; oil cans F16N 3/04; containers for carrying smallarms F41C 33/06; packaging of ammunition or explosive charges F42B 39/00; containers for record carriers, specially adapted for cooperation with the recording or reproducing apparatus G11B 23/00) [5, 6]

**Note(s)**

Containers, packaging elements or packages classified in this group, are also classified according to the constructional or functional features, if such features are of interest.

- 85/02 • for annular articles (for web or tape-like material wound in flat spiral form B65D 85/671)
- 85/04 • • for coils of wire, rope, or hose
- 85/06 • • for tyres
- 85/08 • for compressible or flexible rod-shaped or tubular articles
- 85/10 • • for cigarettes
- 85/12 • • for cigars
- 85/14 • • for collapsible tubes
- 85/16 • for compressible or flexible articles of other shapes (for wearing apparel B65D 85/18)
- 85/18 • for wearing apparel, i.e. clothes, headgear, shoes
- 85/20 • for incompressible or rigid rod-shaped or tubular articles
- 85/22 • • for macaroni, spaghetti, or like flour products
- 85/24 • • for needles, nails, or other like elongated small articles
- 85/26 • • for welding electrodes
- 85/28 • • for pencils or pens (pencil boxes A45C 11/34)
- 85/30 • for articles particularly sensitive to damage by shock or pressure
- 85/32 • • for eggs
- 85/34 • • for fruit, e.g. apples, oranges, tomatoes
- 85/36 • • for biscuits or other bakery products
- 85/38 • • for optical or other delicate measuring, calculating, or control apparatus
- 85/40 • • • for watches or clocks or components thereof
- 85/42 • • for ampoules; for lamp bulbs; for electronic valves or tubes
- 85/44 • • for crockery
- 85/46 • • for bricks, tiles, or building blocks
- 85/48 • • for glass sheets
- 85/50 • for living organisms, articles, or materials sensitive to changes of environment or atmospheric conditions, e.g. land animals, birds, fish, water plants, non-aquatic plants, flower bulbs, cut flowers, foliage (devices for transporting live fish A01K 63/02)
- 85/52 • • for living plants; for growing bulbs
- 85/57 • for recording discs [3]
- 85/575 • for recording-tape cassettes [5]
- 85/58 • for ball bearings, washers, buttons, or like spherical or disc-shaped articles (cards for buttons, collar-studs, sleeve-links A44B 7/00) [3]
- 85/60 • for sweets or like confectionery products [3]
- 85/62 • for stacks of articles; for special arrangements of groups of articles [3]

- 85/64 • for bulky articles [3]
- 85/66 • for jumbo rolls; for rolls of floor covering [3]
- 85/67 • for other web or tape-like material (for recording-tape cassettes B65D 85/575) [3, 5]
- 85/671 • • wound in flat spiral form [3]
- 85/672 • • • on cores [3]
- 85/675 • • wound in helical form [3]
- 85/676 • • • on cores [3]
- 85/677 • • • on flat cards [3]
- 85/68 • for machines, engines, or vehicles in assembled or dismantled form [3]
- 85/72 • for edible or potable liquids, semiliquids, or plastic or pasty materials [3]
- 85/73 • • with means specially adapted for effervescing the liquids, e.g. for forming bubbles or beer head [7]
- 85/74 • • for butter, margarine or lard [3]
- 85/76 • • for cheese [3]
- 85/78 • • for ice-cream [3]
- 85/80 • • for milk [3]
- 85/804 • Disposable containers or packages with contents which are infused or dissolved *in situ* [7]
- 85/808 • • for immersion in the liquid, e.g. tea bags [7]
- 85/812 • • • with features facilitating their suspension [7]
- 85/816 • • into which liquid is added, e.g. cups preloaded with powder or dehydrated food [7]
- 85/82 • for poisons [3]
- 85/84 • for corrosive chemicals [3]
- 85/86 • for electrical components (small electrical components attached to cards, sheets or webs B65D 73/02; for articles particularly sensitive to damage by shock or pressure B65D 85/30; for ampoules, lamp bulbs, electronic valves or tubes B65D 85/42) [6]
- 85/88 • • Batteries [6]
- 85/90 • • Integrated circuits [6]
- 88/00 Large containers** (component parts, details or accessories B65D 90/00; construction or assembling of bulk storage containers employing civil engineering techniques *in situ* or off the site E04H 7/00; gas holders of variable capacity F17B; vessels for containing or storing compressed, liquefied or solidified gases F17C) [3]
- 88/02 • rigid (B65D 88/34-B65D 88/78 take precedence; hoppers B65D 88/26) [3]
- 88/04 • • spherical (B65D 88/12 takes precedence) [3]
- 88/06 • • cylindrical (B65D 88/12 takes precedence) [3]
- 88/08 • • • with a vertical axis [3]
- 88/10 • • parallelepipedic (B65D 88/12 takes precedence) [3]
- 88/12 • • specially adapted for transport (associated with vehicles, *see* the relevant subclasses of B60-B64) [3]
- 88/14 • • • by air [3]
- 88/16 • flexible (B65D 88/34-B65D 88/78 take precedence; hoppers B65D 88/26) [3]
- 88/18 • • bellows-shaped (B65D 88/22 takes precedence; connection of valves to inflatable elastic bodies B60C 29/00) [3]
- 88/20 • • with rigid end-walls (B65D 88/18, B65D 88/22 take precedence) [3]
- 88/22 • • specially adapted for transport (associated with vehicles, *see* the relevant subclasses of B60-B64) [3]
- 88/24 • • • by air [3]

- 88/26 • Hoppers, i.e. containers having funnel-shaped discharge sections (B65D 88/34-B65D 88/78 take precedence) [3]
- 88/28 • • Construction or shape of discharge section [3]
- 88/30 • • specially adapted to facilitate transportation from one utilisation site to another (collapsible hoppers B65D 88/52) [3]
- 88/32 • • in multiple arrangement [3]
- 88/34 • having floating covers, e.g. floating roofs or blankets (venting means B65D 90/34) [3]
- 88/36 • • with relatively movable sections [3]
- 88/38 • • with surface water receiver, e.g. drain [3]
- 88/40 • • with support for aground cover [3]
- 88/42 • • with sealing means between cover rim and receptacle [3]
- 88/44 • • • with magnetic means acting on the seal [3]
- 88/46 • • • with mechanical means acting on the seal [3]
- 88/48 • • • with fluid means acting on the seal [3]
- 88/50 • • • with resilient foam or stuffed seal [3]
- 88/52 • collapsible, i.e. with walls hinged together or detachably connected [3]
- 88/54 • characterised by means facilitating filling or emptying (construction or shape of discharge section of hoppers B65D 88/28; gates or closures B65D 90/54; filling or emptying bunkers, hoppers, or like containers B65G 65/30) [3]
- 88/56 • • by tilting [3]
- 88/58 • • by displacement of walls [3]
- 88/60 • • • of internal walls [3]
- 88/62 • • • • the walls being deformable [3]
- 88/64 • • preventing bridge formation [3]
- 88/66 • • • using vibrating or knocking devices [3]
- 88/68 • • • using rotating devices [3]
- 88/70 • • • using fluid jets (B65D 88/72 takes precedence) [3]
- 88/72 • • Fluidising devices [3]
- 88/74 • having means for heating, cooling, aerating or other conditioning of contents [3]
- 88/76 • for use underground (manholes, inspection openings, covers therefor B65D 90/10) [3]
- 88/78 • for use in or under water (manholes, inspection openings, covers therefor B65D 90/10) [3]
- 90/00 Component parts, details or accessories for large containers** (B65D 88/34-B65D 88/78 take precedence) [3]
- 90/02 • Wall construction [3]
- 90/04 • • Linings [3]
- 90/06 • • Coverings, e.g. for insulating purposes [3]
- 90/08 • • Interconnections of wall parts; Sealing means therefor [3]
- 90/10 • Manholes; Inspection openings; Covers therefor (safety features B65D 90/22; covers or similar closure members, for pressure vessels in general F16J 13/00) [3]
- 90/12 • Supports [3]
- 90/14 • • Legs, e.g. detachable [3]
- 90/16 • • Skids [3]
- 90/18 • • Castors, rolls, or the like, e.g. detachable [3]
- 90/20 • • Frames or nets, e.g. for flexible containers [3]
- 90/22 • Safety features (floating covers B65D 88/34; arrangements of indicating or measuring devices B65D 90/48; fire-fighting A62C) [3]
- 90/24 • • Spillage-retaining means, e.g. recovery ponds [3]
- 90/26 • • Overfill prevention (spillage retaining means B65D 90/24; arrangements of indicating or measuring devices B65D 90/48) [3]
- 90/28 • • Means for preventing or minimising the escape of vapours [3]
- 90/30 • • Recovery of escaped vapours [3]
- 90/32 • • Arrangements for preventing, or minimising the effect of, excessive or insufficient pressure [3]
- 90/34 • • • Venting means (vehicle fuel tanks characterised by venting means B60K 15/035) [3, 5]
- 90/36 • • • Weakened parts [3]
- 90/38 • • Means for reducing the vapour space or for reducing the formation of vapour within containers [3]
- 90/40 • • • by use of fillings of porous materials [3]
- 90/42 • • • by use of particular materials for covering surface of liquids [3]
- 90/44 • • • by use of inert gas for filling space above liquid or between contents [3]
- 90/46 • • Arrangements for carrying off, or preventing the formation of electrostatic charges [3]
- 90/48 • Arrangements of indicating or measuring devices [3]
- 90/50 • • of leakage-indicating devices (investigating fluid-tightness of structures G01M 3/00) [3]
- 90/52 • Anti-slosh devices (vehicle fuel tanks with means modifying or controlling distribution or motion of fuel, e.g. to prevent noise, surge, splash or fuel starvation, B60K 15/077) [3]
- 90/54 • Gates or closures (for manholes B65D 90/10) [3]
- 90/56 • • operating by deformation of flexible walls [3]
- 90/58 • • having closure members sliding in the plane of the opening [3]
- 90/60 • • • and having one or more openings [3]
- 90/62 • • having closure members movable out of the plane of the opening [3]
- 90/64 • • having multipart closure members, the parts being brought into closing position one by one according to need [3]
- 90/66 • • Operating devices therefor [3]

**B65F GATHERING OR REMOVAL OF DOMESTIC OR LIKE REFUSE** (disinfecting refuse A61L; refuse disintegrators B02C; sorting refuse B03B, B07B; handcarts for transporting refuse receptacles B62B; sack holders B65B 67/00; converting refuse into fertilisers C05F; converting refuse into solid fuels C10L; sewers, cesspools E03F; arrangements in buildings for the disposal of refuse E04F 17/10; refuse-consuming furnaces F23G)

- 1/00 Refuse receptacles** (containers not specially adapted for refuse, features of refuse receptacles of general interest B65D)
- 1/02 • without removable inserts
- 1/04 • with removable inserts
- 1/06 • • with flexible inserts, e.g. bags or sacks
- 1/08 • • with rigid inserts
- 1/10 • with refuse filling means, e.g. air-locks
- 1/12 • with devices facilitating emptying
- 1/14 • Other constructional features (holders or carriers for hand articles A45F 5/00; fastening devices for wings E05C; hinges E05D)

## B65F

- 1/16 • • Lids or covers (pedal or hand-lever operated B65D)
- 3/00 Vehicles particularly adapted for collecting refuse** (vehicles in general B60; driving vehicle equipment or auxiliaries B60K; discharging contents by tilting entire vehicles B65G; wheeled apparatus for emptying sewers or cesspools E03F 7/10)
- 3/02 • with means for discharging refuse receptacles thereinto (conveyer construction B65G; loaders separate from vehicles B66F; fluid power control systems in general F15B)
- 3/04 • • Linkages, pivoted arms, or pivoted carriers for raising and subsequently tipping receptacles
- 3/06 • • • Arrangement or disposition of fluid actuators
- 3/08 • • Platform elevators or hoists with guides or runways for raising or tipping receptacles
- 3/10 • • • Arrangement or disposition of fluid actuators
- 3/12 • • Conjoint motion of lids, flaps, and shutters on vehicle and on receptacle; Operation of closures on vehicle conjointly with tipping of receptacle
- 3/14 • with devices for charging, distributing, or compressing refuse in the interior of the tank of a refuse vehicle (B65F 3/02 takes precedence) [2]
- 3/16 • • with conveyer wheels (with screw conveyers B65F 3/22) [2]
- 3/18 • • with endless conveyers, e.g. elevators [2]
- 3/20 • • with charging pistons, plates, or the like (for discharging B65F 3/28) [2]
- 3/22 • • with screw conveyers, rotary tanks [2]
- 3/24 • with devices for unloading the tank of a refuse vehicle [2]
- 3/26 • • by tipping the tank [2]
- 3/28 • • by a lengthwise movement of a wall, e.g. a plate, a piston, or the like (for charging B65F 3/20) [2]
- 5/00 Gathering or removal of refuse otherwise than by receptacles or vehicles** (storage silos, charging or discharging thereof B65G)
- 7/00 Cleaning or disinfecting devices combined with refuse receptacles or refuse vehicles** (such devices per se A61L, B08B)
- 9/00 Transferring of refuse between vehicles or containers with intermediate storage or pressing** (presses for baling per se B30B 9/30) [4]

**B65G TRANSPORT OR STORAGE DEVICES, e.g. CONVEYERS FOR LOADING OR TIPPING; SHOP CONVEYER SYSTEMS; PNEUMATIC TUBE CONVEYERS** (transport or storage devices used in a particular handling or treatment of articles or materials, see the relevant subclass, e.g. in metal-working B21D 43/00, B23Q 7/00, B23Q 41/02; vehicle, railway, sea or aircraft aspects B60-B64; transportation, conveyor or haulage systems specially adapted for motor vehicle or trailer assembly lines B62D 65/18; in packaging B65B; handling thin or filamentary materials B65H; hoisting, lifting, hauling, e.g. truck loaders B66; handling liquids B67; specially adapted to underground conditions E21F 13/00; storing or distributing gases or liquids F17; in handling radioactive materials G21C 19/00)

### Subclass index

#### HANDLING AND STORAGE

Loading and unloading.....	65/00, 67/00, 69/00
Transfer, trans-shipment.....	63/00
Storage.....	1/00, 3/00, 5/00
Piling, unpling	
of articles.....	57/00-61/00
of loose material.....	65/28
Assisting manual handling.....	7/00, 9/00

#### CONVEYERS, CHUTES

Mechanical	
with endless element.....	15/00-23/00
with particular movement.....	25/00, 27/00, 29/00, 33/00
other kinds.....	35/00
combinations or systems of general use.....	37/00, 49/00
chutes; roller-ways; projectors.....	11/00, 13/00, 31/00
Parts or auxiliary devices applicable to different kinds	
rollers; frames; auxiliary handling.....	39/00, 41/00, 47/00
control, safety; maintenance.....	43/00, 45/00
Non-mechanical.....	51/00, 53/00, 54/00



**Storing; Storage devices**

- 1/00 Storing articles, individually or in orderly arrangement, in warehouses or magazines** (conveyer combinations in warehouses, magazines, or workshops B65G 37/00; stacking of articles B65G 57/00; removing articles from stacks B65G 59/00; loading machines B65G 65/02; arrangements of articles for drying or baking in kilns or ovens F26, F27)
- 1/02 • Storage devices (furniture, shop fittings, table equipment A47B, A47F, A47G; mechanical garages E04H; for data record cards in association with machines for marking or sensing data G06K; coin changers or sorters G07D; coin-freed apparatus G07F)
- 1/04 • • mechanical
- 1/06 • • • with means for presenting articles for removal at predetermined position or level (B65G 1/12 takes precedence) [3]
- 1/07 • • • • the upper article of a pile being always presented at the same predetermined level [3]
- 1/08 • • • • the articles being fed by gravity
- 1/10 • • • with relatively-movable racks to facilitate insertion or removal of articles
- 1/12 • • • with article supports or holders movable in a closed circuit to facilitate insertion or removal of articles
- 1/127 • • • • the circuit being confined in a vertical plane [3]
- 1/133 • • • • the circuit being confined in a horizontal plane [3]
- 1/137 • • • with arrangements or automatic control means for selecting which articles are to be removed (devices for feeding articles to conveyers from several groups of articles B65G 47/10) [4]
- 1/14 • • Stack holders or separators
- 1/16 • Special arrangements of articles in storage spaces
- 1/18 • • Articles inclined so as to be mutually self-supporting
- 1/20 • • Articles arranged in layers with spaces between articles
- 3/00 Storing bulk material or loose, i.e. disorderly, articles** (filling or emptying storage spaces or containers, spreading-out or piling-up bulk material or loose articles B65G 65/28, B65G 65/30, B65G 69/04; storing agricultural or horticultural produce A01F 25/00)
- 3/02 • in the open air (B65G 3/04 takes precedence)
- 3/04 • in bunkers, hoppers or like large containers (such containers per se B65D 88/00)
- 5/00 Storing fluids in natural or artificial cavities or chambers in the earth** (modification of mine passages or chambers for storage purposes, especially for fluids E21F 17/16)

**Devices assisting manual conveyance of articles over short distances, e.g. in storage depots, warehouses or factories**

- 7/00 Devices for assisting manual moving or tilting heavy loads** (chutes B65G 11/00; roller-ways B65G 13/00; for tilting and emptying barrels or casks B65G 65/24)
- 7/02 • Devices adapted to be interposed between loads and the ground or floor, e.g. crowbars with means for assisting conveyance of loads (crowbars per se B66F 15/00)
- 7/04 • • Rollers

- 7/06 • • using fluid at high pressure supplied from an independent source to provide a cushion between load and ground
- 7/08 • • for tilting the loads
- 7/10 • • for rolling cylindrical loads
- 7/12 • Load-carriers, e.g. hooks, slings, harness, gloves, modified for load-carrying

- 9/00 Apparatus for assisting manual handling having suspended load-carriers movable by hand or gravity** (manually-operated endless-rope or chain conveyers B65G 17/00; railway systems B61B)

**Chutes; Kinds or types of conveyers; Constructional features, details, or auxiliary devices peculiar to conveyers of particular types [4]**

- 11/00 Chutes** (used as storage devices B65G 1/02, B65D 88/26; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; for sports, games, or amusements A63G 21/00; for refuse disposal in buildings E04F 17/12)
- 11/02 • of straight form
- 11/04 • for mail in buildings
- 11/06 • of helical or spiral form
- 11/08 • with discontinuous guiding surfaces, e.g. arranged in zig-zag or cascade formation
- 11/10 • flexible
- 11/12 • pivotable
- 11/14 • extensible, e.g. telescopic
- 11/16 • Interior surfaces; Linings
- 11/18 • Supports or mountings
- 11/20 • Auxiliary devices, e.g. for deflecting, controlling speed of, or agitating, articles or solids
- 13/00 Roller-ways** (storage devices comprising roller-ways B65G 1/02; endless-chain conveyers comprising load-supporting rollers B65G 17/00; rollers, or arrangements thereof B65G 39/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; in metal-rolling equipment B21B 39/00, B21B 41/00)
- 13/02 • having driven rollers
- 13/04 • • all rollers driven
- 13/06 • • Roller driving means [3]
- 13/07 • • • having endless driving elements
- 13/071 • • • with frictional engagement
- 13/073 • • • comprising free-wheel gearing
- 13/075 • Braking means [3]
- 13/08 • of curved form; with branch-offs
- 13/10 • • Switching arrangements
- 13/11 • Roller frames
- 13/12 • • adjustable
- 15/00 Conveyers having endless load-conveying surfaces, i.e. belts and like continuous members, to which tractive effort is transmitted by means other than endless driving elements of similar configuration** (having load-conveying surfaces formed by interconnected longitudinal links B65G 17/06; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 15/02 • for conveying in a circular arc
- 15/04 • the load being carried on the lower run of the endless surface

- 15/06 • with oppositely-moving parts of the endless surface located in the same plane and parallel to one another
- 15/08 • the load-carrying surface being formed by a concave or tubular belt, e.g. a belt forming a trough
- 15/10 • comprising two or more co-operating endless surfaces with parallel longitudinal axes, or a multiplicity of parallel elements, e.g. ropes defining an endless surface
- 15/12 • • with two or more endless belts
- 15/14 • • • the load being conveyed between the belts
- 15/16 • • • between an auxiliary belt and a main belt
- 15/18 • • • the belts being sealed at their edges (endless-surface conveyers having a single belt with sealed edges B65G 15/08)
- 15/20 • • • arranged side by side, e.g. for conveyance of flat articles in vertical position (for conveying sheets or like thin flat articles B65H)
- 15/22 • comprising a series of co-operating units
- 15/24 • • in tandem
- 15/26 • • extensible, e.g. telescopic
- 15/28 • Conveyers with a load-conveying surface formed by a single flat belt, not otherwise provided for
- 15/30 • Belts or like endless load-carriers (co-operating with rails or the like B65G 21/22; with rollers B65G 39/20; belts in general F16G)
- 15/32 • • made of rubber or plastics
- 15/34 • • • with reinforcing layers, e.g. of fabric
- 15/36 • • • • the layers incorporating ropes, chains, or rolled steel sections
- 15/38 • • • with flame-resistant layers, e.g. of asbestos, glass
- 15/40 • • • troughed or tubular; formed with joints facilitating troughing
- 15/42 • • • having ribs, ridges, or other surface projections
- 15/44 • • • • for impelling the loads
- 15/46 • • • formed with guides
- 15/48 • • metallic
- 15/50 • • Endless load-carriers consisting of a series of parallel ropes or belt strips
- 15/52 • • • interconnected by transverse slats
- 15/54 • • Endless load-carriers made of interwoven ropes or wires
- 15/56 • • with edge-protecting or reinforcing means
- 15/58 • • with means for holding or retaining the loads in fixed position, e.g. magnetic
- 15/60 • Arrangements for supporting or guiding belts, e.g. by fluid jets (construction of rollers or supports therefor B65G 39/00, F16G)
- 15/62 • • Guides for sliding belts
- 15/64 • • for automatically maintaining the position of the belts
- 17/00 Conveyers having an endless traction element, e.g. a chain, transmitting movement to a continuous or substantially-continuous load-carrying surface or to a series of individual load-carriers; Endless-chain conveyers in which the chains form the load-carrying surface** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; railway systems, detachable load-carriers on rails B61B; escalators or paternosters neither combined nor associated with loading or unloading apparatus B66B 9/00)
- 17/02 • comprising a load-carrying belt attached to, or resting on, the traction element
- 17/04 • • the belt having loops forming load-receiving pockets
- 17/06 • having a load-carrying surface formed by a series of interconnected, e.g. longitudinal, links, plates, or platforms
- 17/08 • • the surface being formed by the traction element
- 17/10 • • the surface forming a longitudinal trough
- 17/12 • comprising a series of individual load-carriers fixed, or normally fixed, relative to traction element
- 17/14 • • with two spaced connections to traction element
- 17/16 • comprising individual load-carriers which are pivotally mounted, e.g. for free-swinging movement (guides inverting or tilting load-carriers for emptying B65G 47/34)
- 17/18 • • and move in contact with a guiding surface
- 17/20 • comprising load-carriers suspended from overhead traction chains
- 17/22 • with oppositely-moving parts of the conveyer located in a common plane
- 17/24 • comprising a series of rollers which are moved over a supporting surface by the traction element to effect conveyance of loads or load-carriers
- 17/26 • comprising a series of co-operating units, e.g. interconnected by pivots
- 17/28 • • extensible, e.g. telescopic
- 17/30 • Details; Auxiliary devices (belts B65G 15/30; framework B65G 21/00)
- 17/32 • • Individual load-carriers (control B65G 17/48)
- 17/34 • • • having flat surfaces, e.g. platforms, grids, forks
- 17/36 • • • having concave surfaces, e.g. buckets
- 17/38 • • Chains or like traction elements (chains in general F16G); Connections between traction elements and load-carriers
- 17/40 • • • Chains acting as load-carriers
- 17/42 • • • Attaching load-carriers to traction elements
- 17/44 • • • • by means excluding relative movements
- 17/46 • • Means for holding or retaining the loads in fixed position on the load-carriers, e.g. magnetic
- 17/48 • • Controlling attitudes of load-carriers during movement (guides B65G 21/20; inverting or tilting load-carriers to discharge contents B65G 47/38)
- 19/00 Conveyers comprising an impeller or a series of impellers carried by an endless traction element and arranged to move articles or materials over a supporting surface or underlying material, e.g. endless scraper conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 19/02 • for articles, e.g. for containers
- 19/04 • for moving bulk material in open troughs or channels
- 19/06 • • the impellers being scrapers similar in size and shape to the cross-section of the trough or channel
- 19/08 • • • and attached to a single belt, rope, or chain
- 19/10 • • • and attached to a pair of belts, ropes, or chains
- 19/12 • • the impellers being plates having an area substantially smaller than that of the trough or channel cross-section
- 19/14 • for moving bulk material in closed conduits, e.g. tubes
- 19/16 • • the impellers being elements having an area substantially smaller than that of the conduit cross-section
- 19/18 • Details
- 19/20 • • Traction chains, ropes, or cables
- 19/22 • • Impellers, e.g. push-plates, scrapers; Guiding means therefor
- 19/24 • • • Attachment of impellers to traction element

- 19/26 • • • • pivotal
- 19/28 • • Troughs, channels, or conduits
- 19/30 • • • with supporting surface modified to facilitate movement of loads, e.g. friction-reducing devices
  
- 21/00 Supporting or protective framework or housings for endless load-carriers or traction elements of belt or chain conveyers** (supporting framework or bases for conveyers as a whole B65G 41/00)
- 21/02 • consisting essentially of struts, ties, or like structural elements
- 21/04 • • the ties being formed by longitudinal cables or ropes
- 21/06 • • constructed to facilitate rapid assembly or dismantling
- 21/08 • Protective roofs or arch supports therefor
- 21/10 • movable, or having interchangeable or relatively-movable parts; Devices for moving framework or parts thereof
- 21/12 • • to allow adjustment of position of load-carrier or traction element as a whole
- 21/14 • • to allow adjustment of length or configuration of load-carrier or traction element (tensioning arrangements for belt or chain B65G 23/44)
- 21/16 • for conveyers having endless load-carriers movable in curved paths
- 21/18 • • in three-dimensionally curved paths
- 21/20 • Means incorporated in, or attached to, framework or housings for guiding load-carriers, traction elements, or loads supported on moving surfaces (arrangements for supporting belts B65G 15/60; rollers or roller arrangements B65G 39/00, F16G)
- 21/22 • • Rails or the like engaging sliding elements or rollers attached to load-carriers or traction elements
  
- 23/00 Driving gear for endless conveyers** (control devices for conveyers in general B65G 43/00); **Belt- or chain-tensioning arrangements**
- 23/02 • Belt- or chain-engaging elements
- 23/04 • • Drums, rollers, or wheels
- 23/06 • • • with projections engaging abutments on belts or chains, e.g. sprocket wheels
- 23/08 • • • with self-contained driving mechanisms, e.g. motors and associated gearing
- 23/10 • • • arranged intermediate the ends of the conveyers
- 23/12 • • • Arrangements of co-operating drums or rollers to augment tractive effort applied to the belts
- 23/14 • • Endless driving elements extending parallel to belt or chain
- 23/16 • • • with dogs engaging abutments on belts or chains
- 23/18 • • Suction or magnetic elements
- 23/19 • • • Suction elements [3]
- 23/20 • • Screws
- 23/22 • Arrangements or mountings of driving motors
- 23/23 • • of electric linear motors [3]
- 23/24 • Gearing between driving motor and belt- or chain-engaging elements (contained in drums, rollers, or wheels B65G 23/08)
- 23/26 • • Applications of clutches or brakes
- 23/28 • • Arrangements for equalising the drive to several elements
- 23/30 • • Variable-speed gearing
- 23/32 • for effecting drive at two or more points spaced along the length of the conveyers
  
- 23/34 • • comprising a single motor coupled to spaced driving elements
- 23/36 • • comprising two or more driving motors each coupled to a separate driving element, e.g. at either end of the conveyers
- 23/38 • for effecting intermittent movement of belts or chains
- 23/40 • • Applications of pawl-and-ratchet mechanisms or Geneva wheels
- 23/42 • • Reciprocating members engaging successive abutments on belts or chains
- 23/44 • Belt- or chain-tensioning arrangements
  
- 25/00 Conveyers comprising a cyclically-moving, e.g. reciprocating, carrier or impeller which is disengaged from the load during the return part of its movement** (jigging B65G 27/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; pumps F04)
- 25/02 • the carrier or impeller having different forward and return paths of movement, e.g. walking-beam conveyers
- 25/04 • the carrier or impeller having identical forward and return paths of movement, e.g. reciprocating conveyers
- 25/06 • • having carriers, e.g. belts
- 25/08 • • having impellers, e.g. pushers
- 25/10 • • • with impeller pivotally mounted on a reciprocating bar
- 25/12 • • • with impeller fixed to a reciprocating bar and the bar being rotated about its longitudinal axis on its return stroke
  
- 27/00 Jigging conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; jigs for wet separation B03B; generating or transmitting mechanical vibrations B06; jiggers for screening, sifting, or sorting B07B 1/28)
- 27/02 • comprising helical or spiral channels or conduits for elevation of materials (helical or spiral chutes in general B65G 11/06)
- 27/04 • Load-carriers other than helical or spiral channels or conduits
- 27/06 • • Joints connecting load-carrier sections
- 27/08 • Supports or mountings for load-carriers, e.g. framework, bases, spring arrangements
- 27/10 • Applications of devices for generating or transmitting jigging movements
- 27/12 • • of shaking devices, i.e. devices for producing movements of low frequency and large amplitude
- 27/14 • • • hydraulic
- 27/16 • • of vibrators, i.e. devices for producing movements of high frequency and small amplitude
- 27/18 • • • Mechanical devices
- 27/20 • • • • rotating unbalanced masses
- 27/22 • • • Hydraulic or pneumatic devices
- 27/24 • • • Electromagnetic devices
- 27/26 • • • with elastic coupling between vibrator and load-carrier
- 27/28 • • with provision for dynamic balancing
- 27/30 • • • by means of an oppositely-moving mass, e.g. a second conveyer
- 27/32 • • with means for controlling direction, frequency, or amplitude of vibration or shaking movement
- 27/34 • comprising a series of co-operating units

- 29/00 Rotary conveyers, e.g. rotating discs, arms, star-wheels or cones** (mechanical projectors B65G 31/00; screw or rotary spiral conveyers B65G 33/00; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 29/02 • for inclined or vertical transit (B65G 15/00, B65G 17/00 take precedence)
- 31/00 Mechanical throwing machines for articles or solid materials** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; distributors for fertilisers A01C; moulding machines B22C; sandblasting devices B24C; implements for applying plaster E04F 21/06)
- 31/02 • comprising belts
- 31/04 • comprising discs, drums, or like rotary impellers
- 33/00 Screw or rotary spiral conveyers** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; screws for extruding, compressing, kneading, mixing, pumping, or other special operations, see the relevant classes)
- 33/02 • for articles
- 33/04 • • conveyed between a single screw and guiding means
- 33/06 • • conveyed and guided by parallel screws
- 33/08 • for fluent solid materials
- 33/10 • • with non-enclosed screws
- 33/12 • • with screws formed by straight tubes or drums having internal threads, or by spiral or helical tubes
- 33/14 • • comprising a screw or screws enclosed in a tubular housing
- 33/16 • • • with flexible screws operating in flexible tubes
- 33/18 • • • with multiple screws in parallel arrangements
- 33/20 • • • the housing being rotatable relative to the screw
- 33/22 • • • with means for retarding material flow at the delivery end of the housing
- 33/24 • Details
- 33/26 • • Screws (as gearing elements F16H 25/20)
- 33/30 • • • with a discontinuous helical surface
- 33/32 • • Adaptations of bearings or couplings for supporting or connecting screws (B65G 33/16 takes precedence)
- 33/34 • • Applications of driving gear
- 33/36 • • • for rotating housing and screw at different speeds
- 33/38 • • • for effecting simultaneous rotation and reciprocation of screw
- 35/00 Mechanical conveyers not otherwise provided for** (feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00)
- 35/02 • comprising an endless traction element, e.g. a belt, arranged to roll cylindrical articles over a supporting surface
- 35/04 • comprising a flexible load-carrier, e.g. a belt, which is wound-up at one end and paid-out at the other (reciprocating belt conveyers B65G 25/06)
- 35/06 • comprising a load-carrier moving along a path, e.g. a closed path, and adapted to be engaged by any one of a series of traction elements spaced along the path (effecting drive at two or more points spaced along the length of an endless conveyor B65G 23/32)

- 35/08 • comprising trains of unconnected load-carriers, e.g. belt sections, movable in a path, e.g. a closed path, adapted to contact each other and to be propelled by means arranged to engage each load-carrier in turn
- 37/00 Combinations of mechanical conveyers of the same kind, or of different kinds, of interest apart from their application in particular machines or use in particular manufacturing processes** (mechanical storage devices B65G 1/04; series of co-operating belt conveyer units B65G 15/22; series of co-operating chain conveyer units B65G 17/26; sequence control of combined conveyers B65G 43/10; feeding or discharging conveyers by devices incorporated in, or operatively associated with, conveyers B65G 47/00; specially adapted for handling radioactive materials G21)
- 37/02 • Flow sheets for conveyer combinations in warehouses, magazines, or workshops

**Common features or details of, or auxiliary devices applicable to, conveyers of different kinds or types; Feeding or discharging devices incorporated in, or operatively associated with, conveyers**

- 39/00 Rollers, e.g. drive rollers, or arrangements thereof incorporated in roller-ways or other types of mechanical conveyers** (driving gear for rollers of roller-ways B65G 13/06; drive rollers of endless conveyers B65G 23/04; arrangement of rollers in metal-rolling equipment B21B 39/10; friction members F16H 55/32)
- 39/02 • Adaptations of individual rollers and supports therefor
- 39/04 • • the rollers comprising a number of roller-forming elements mounted on a single axle
- 39/06 • • the roller sleeves being shock-absorbing, e.g. formed by helically-wound wires
- 39/07 • • Other adaptations of sleeves
- 39/071 • • • for aligning belts or sheets
- 39/073 • • • for cleaning belts
- 39/08 • • the rollers being magnetic (in magnetic belt separators B03C 1/00)
- 39/09 • • Arrangements of bearing or sealing means
- 39/10 • Arrangements of rollers (on a single axle B65G 39/04)
- 39/12 • • mounted on framework
- 39/14 • • • Spring-supported sets, e.g. permitting troughing of a load-carrying belt
- 39/16 • • • for aligning belts or chains (for aligning tapes or webs B65H)
- 39/18 • • • for guiding loads
- 39/20 • • attached to moving belts or chains (belts B65G 15/30; chains B65G 17/44)
- 41/00 Supporting frames or bases for conveyers as a whole, e.g. transportable conveyer frames**
- 41/02 • Frames mounted on wheels for movement on rail tracks
- 43/00 Control, e.g. safety, warning, fault-correcting, devices** (for elevators, escalators or moving walkways B66B; in general F16P, G08B)
- 43/02 • detecting dangerous physical condition of load-carriers, e.g. for interrupting the drive in the event of overheating
- 43/04 • detecting slip between driving element and load-carrier, e.g. for interrupting the drive

- 43/06 • interrupting the drive in case of driving-element breakage; Braking or stopping loose load-carriers
- 43/08 • Control devices operated by article or material being fed, conveyed, or discharged
- 43/10 • Sequence control of conveyers operating in combination
- 45/00 Lubricating, cleaning, or clearing devices**
- 45/02 • Lubricating devices
- 45/04 • • for rollers [5]
- 45/06 • • • forming belt troughing structure [5]
- 45/08 • • for chains [5]
- 45/10 • Cleaning devices (adaptations of roller sleeves for cleaning belts B65G 39/073) [5]
- 45/12 • • comprising scrapers [5]
- 45/14 • • • Moving scrapers [5]
- 45/16 • • • with scraper biasing means [5]
- 45/18 • • comprising brushes [5]
- 45/20 • • comprising screws [5]
- 45/22 • • comprising fluid applying means [5]
- 45/24 • • comprising plural diverse cleaning devices [5]
- 45/26 • • for gathering residue after cleaning [5]
- 47/00 Article or material-handling devices associated with conveyers; Methods employing such devices (for sorting, e.g. postal, B07C)**
- 47/02 • Devices for feeding articles or materials to conveyers
- 47/04 • • for feeding articles
- 47/06 • • • from a single group of articles arranged in orderly pattern, e.g. workpieces in magazines (de-stacking devices B65G 59/00; picking-up flat workpieces B65H)
- 47/08 • • • • spacing or grouping the articles during feeding (during transit by conveyer B65G 47/28)
- 47/10 • • • from several groups of articles
- 47/12 • • • from disorderly-arranged article piles or from loose assemblages of articles
- 47/14 • • • • arranging or orientating the articles by mechanical or pneumatic means during feeding (during transit by conveyer B65G 47/24, B65G 47/26)
- 47/16 • • for feeding materials in bulk
- 47/18 • • • Arrangements or applications of hoppers or chutes
- 47/19 • • • • having means for controlling material flow, e.g. to prevent overloading (controlling feed or discharge by weighing a continuous stream of material G01G 11/08)
- 47/20 • • • • the hoppers or chutes being movable
- 47/22 • Devices influencing the relative position or the attitude of articles during transit by conveyers (during feeding B65G 47/14)
- 47/24 • • orientating the articles
- 47/244 • • • by turning them about an axis substantially perpendicular to the conveying plane [5]
- 47/248 • • • by turning over or inverting them (B65G 47/244 takes precedence) [5]
- 47/252 • • • • about an axis substantially perpendicular to the conveying direction [5]
- 47/256 • • • removing incorrectly orientated articles [5]
- 47/26 • • arranging the articles, e.g. varying spacing between individual articles (stacking or de-stacking B65G 57/00, B65G 59/00, B65G 61/00)
- 47/28 • • • during transit by a single conveyer
- 47/29 • • • • by temporarily stopping movement
- 47/30 • • • during transit by a series of conveyers
- 47/31 • • • • by varying the relative speeds of the conveyers forming the series
- 47/32 • • • • Applications of transfer devices
- 47/34 • Devices for discharging articles or materials from conveyers (B65G 47/256 takes precedence; sorting in general B07)
- 47/36 • • by detaching suspended articles
- 47/38 • • by dumping, tripping, or releasing load-carriers
- 47/40 • • • by tilting conveyer buckets
- 47/42 • • operated by article or material being conveyed and discharged
- 47/44 • • Arrangements or applications of hoppers or chutes
- 47/46 • • with distribution, e.g. automatically, to desired points (in tube mail systems B65G 51/36; postal or like sorting B07C)
- 47/48 • • • according to bodily destination marks on either articles or load-carriers (marking data records G06K)
- 47/49 • • • • without bodily contact between article or load-carrier and automatic control device
- 47/50 • • • according to destination signals stored in separate systems (control by programme G05B 19/00)
- 47/51 • • • according to unprogrammed signals, e.g. influenced by supply situation at destination (volume, flow, or liquid level meters G01F; scales or weighing machines G01G; remote controls G05G)
- 47/52 • Devices for transferring articles or materials between conveyers, i.e. discharging or feeding devices (loading or unloading by means not incorporated in, or not operatively associated with, conveyers B65G 65/00; transfer of workpieces during metal rolling B21B 41/00)
- 47/53 • • between conveyers which cross one another [3]
- 47/54 • • • at least one of which is a roller-way [3]
- 47/56 • • to or from inclined or vertical conveyer sections
- 47/57 • • • for articles
- 47/58 • • • for materials in bulk
- 47/60 • • to or from conveyers of the suspended, e.g. trolley, type
- 47/61 • • • for articles
- 47/62 • • • for materials in bulk
- 47/64 • • Switching conveyers
- 47/66 • • Fixed platforms or combs, e.g. bridges between conveyers
- 47/68 • • adapted to receive articles arriving in one layer from one conveyer and to transfer them in individual layers to more than one conveyer, or *vice versa*, e.g. combining the flows of articles conveyed by more than one conveyer
- 47/69 • • • the articles being accumulated temporarily
- 47/70 • • • with precedence controls among incoming article flows
- 47/71 • • • the articles being discharged to several conveyers
- 47/72 • • transferring materials in bulk from one conveyer to several conveyers, or *vice versa*
- 47/74 • Feeding, transfer, or discharging devices of particular kinds or types
- 47/76 • • Fixed or adjustable ploughs or transverse scrapers
- 47/78 • • Troughs having discharge openings and closures
- 47/80 • • Turntables carrying articles or materials to be transferred, e.g. combined with ploughs or scrapers

47/82	• • Rotary or reciprocating members for direct action on articles or materials, e.g. pushers, rakes, shovels	51/20	• • Braking arrangements
47/84	• • Star-shaped wheels or devices having endless travelling belts or chains, the wheels or devices being equipped with article-engaging elements	51/22	• • Arrangements for stopping the carriers en route in order to control carrier sequence; Blocking or separating devices
47/86	• • • the article-engaging elements being grippers	51/24	• • Switches
47/88	• • Separating or stopping elements, e.g. fingers (attached to star-shaped wheels B65G 47/84)	51/26	• • Stations
47/90	• • Devices for picking-up and depositing articles or materials	51/28	• • • for despatch
47/91	• • • incorporating pneumatic, e.g. suction, grippers	51/30	• • • for delivery
47/92	• • • incorporating electrostatic or magnetic grippers	51/32	• • • for despatch, delivery, and transit
47/94	• • Devices for flexing or tilting travelling structures; Throw-off carriages	51/34	• • Two-way operation
47/95	• • • adapted for longitudinal delivery	51/36	• • Other devices for indicating or controlling movements of carriers, e.g. for supervising individual tube sections, for counting carriers, for reporting jams or other operating difficulties
47/96	• • • Devices for tilting links or platforms	51/38	• • • Contact devices on interior of tubes for detecting passage of carriers
<hr/>		51/40	• • • Automatically distributing the carriers to desired stations
<b>49/00</b>	<b>Conveying systems characterised by their application for specified purposes not otherwise provided for</b> (for conveying sheet material B65H)	51/42	• • • • according to indications on carriers
49/02	• for conveying workpieces through baths of liquid	51/44	• • • • without mechanical contact between carriers and controllers
49/04	• • the workpieces being immersed and withdrawn by movement in a vertical direction	51/46	• • • • according to separate signal systems
49/05	• for fragile or damageable materials or articles [4]	<b>53/00</b>	<b>Conveying materials in bulk through troughs, pipes, or tubes by floating the materials, or by flow of gas, liquid, or foam</b> (fluidising in connection with loading or unloading B65G 69/06; loaders for hay or like field crops A01D 87/00; fluidising devices facilitating filling or emptying of large containers B65D 88/72; dredging E02F; winning materials out of alluvial deposits E21C 45/00; hydraulic or pneumatic mine-filling-up machines E21F 15/00; fluid dynamics F15D; pipe-line systems F17D)
49/06	• • for fragile sheets, e.g. glass (transporting of glass products during their manufacture C03B 35/00) [4]	53/02	• Floating material troughs (air slides B65G 53/04)
49/07	• • for semiconductor wafers (specially adapted for conveying of semiconductor wafers during manufacture or treatment of semiconductor or electric solid state devices or components H01L 21/677) [5, 2006.01]	53/04	• Conveying materials in bulk pneumatically through pipes or tubes; Air slides
49/08	• • for ceramic mouldings (charging, discharging, manipulation with charge in kilns F27D 3/00) [4]	53/06	• • Gas pressure systems operating without fluidisation of the materials
<b><u>Non-mechanical conveying through pipes or tubes; Floating in troughs</u></b>		53/08	• • • with mechanical injection of the materials, e.g. by screw
<b>51/00</b>	<b>Conveying articles through pipes or tubes by fluid flow or pressure</b> (water roundabouts A63G 3/00; pneumatic railways B61B); <b>Conveying articles over a flat surface, e.g. the base of a trough, by jets located in the surface</b> (pumps F04; fluid dynamics F15D; valves, taps, cocks F16K; pipes, pipe joints, or associated devices F16L)	53/10	• • • with pneumatic injection of the materials by the propelling gas
51/01	• Hydraulic transport of articles (B65G 51/04 takes precedence) [6]	53/12	• • • • the gas flow acting directly on the materials in a reservoir
51/02	• Directly conveying the articles, e.g. slips, sheets, stockings, containers or workpieces, by flowing gases	53/14	• • • • the gas flow inducing feed of the materials by suction effect
51/03	• • over a flat surface or in troughs [4]	53/16	• • Gas pressure systems operating with fluidisation of the materials
51/04	• Conveying the articles in carriers having a cross-section approximating that of the pipe or tube; Tube mail systems	53/18	• • • through a porous wall
51/06	• • Despatch carriers for tube mail	53/20	• • • • of an air slide, e.g. a trough
51/08	• • Controlling or conditioning the operating medium (in compressors F04; air-conditioning, e.g. de-watering, in pneumatic systems F16L 55/09)	53/22	• • • • the systems comprising a reservoir, e.g. a bunker
51/10	• • • at section junctions of pneumatic systems	53/24	• • Gas suction systems
51/12	• • • • Pneumatic gates	53/26	• • • operating with fluidisation of the materials
51/14	• • • • Pneumatic sluices	53/28	• • Systems utilising a combination of gas pressure and suction (inducing feed of the materials by suction in gas pressure systems B65G 53/14)
51/16	• • • varying, e.g. starting or stopping, gas pressure or flow	53/30	• Conveying materials in bulk through pipes or tubes by liquid pressure
51/18	• • Adaptations of pipes or tubes; Pipe or tube joints	53/32	• Conveying concrete, e.g. for distributing same at building sites (mixing concrete on or by conveyers B28C 5/34)
		53/34	• Details
		53/36	• • Arrangements of containers
		53/38	• • Modification of material containing walls to facilitate fluidisation
		53/40	• • Feeding or discharging devices

- 53/42 • • • Nozzles (in general B05B)
- 53/44 • • • Endless conveyers
- 53/46 • • • Gates or sluices, e.g. rotary wheels
- 53/48 • • • Screws or like rotary conveyers
- 53/50 • • • Pneumatic devices (incorporated in nozzles B65G 53/42)
- 53/52 • • Adaptations of pipes or tubes
- 53/54 • • • Flexible pipes or tubes
- 53/56 • • • Switches
- 53/58 • • Devices for accelerating or decelerating flow of the materials; Use of pressure generators (controlling pressure of propelling gas B65G 53/66)
- 53/60 • • Devices for separating the materials from propellant gas
- 53/62 • • • using liquid
- 53/64 • • • in discrete amounts
- 53/66 • • Use of indicator or control devices, e.g. for controlling gas pressure, for controlling proportions of material and gas, for indicating or preventing jamming of material

#### **54/00 Non-mechanical conveyers not otherwise provided for [3]**

- 54/02 • electrostatic, electric, or magnetic [3]

#### **Stacking or de-stacking; Loading or unloading**

##### **Note(s)**

In groups B65G 57/00-B65G 61/00, the following term is used with the meaning indicated:

- "stacking" means disposing articles individually or in layers one above each other.

- 57/00 Stacking of articles** (B65G 60/00 takes precedence; stacking of jumbo rolls B41F; stackable containers B65D; feeding, piling, or stacking sheets B65H; stacked delivery of machined products, see the relevant classes for the machines)
- 57/02 • by adding to the top of the stack
- 57/03 • • from above
- 57/04 • • • by suction or magnetic devices
- 57/06 • • • Gates for releasing articles
- 57/08 • • articles being tilted or inverted prior to depositing
- 57/081 • • • alternate articles being inverted
- 57/09 • • from alongside
- 57/10 • • • by devices, e.g. reciprocating, acting directly on articles for horizontal transport to the top of stack
- 57/11 • • the articles being stacked by direct action of the feeding conveyor
- 57/112 • • • the conveyor being adjustable in height
- 57/14 • • • the articles being transferred from carriers moving in an endless path adjacent to the stacks (conveyor constructions B65G 15/00-B65G 35/00; combinations of conveyers B65G 37/00)
- 57/16 • • Stacking of articles of particular shape
- 57/18 • • • elongated, e.g. sticks, rods, bars
- 57/20 • • • three-dimensional, e.g. cubiform, cylindrical
- 57/22 • • • in layers, each of predetermined arrangement

- 57/24 • • • • the layers being transferred as a whole, e.g. on pallets
- 57/26 • • • • the arrangement providing for spaces between the articles
- 57/28 • by assembling the articles and tilting the assembled articles to a stacked position
- 57/30 • by adding to the bottom of the stack
- 57/32 • characterised by stacking during transit
- 59/00 De-stacking of articles** (B65G 60/00 takes precedence)
- 59/02 • De-stacking from the top of the stack
- 59/04 • • by suction or magnetic devices
- 59/06 • De-stacking from the bottom of the stack
- 59/08 • De-stacking after preliminary tilting of the stack
- 59/10 • De-stacking nested articles
- 59/12 • characterised by de-stacking during transit
- 60/00 Simultaneously or alternatively stacking and de-stacking of articles**
- 61/00 Use of pick-up or transfer devices or of manipulators for stacking or de-stacking articles not otherwise provided for** (manipulators B25J)

- 63/00 Transferring or trans-shipping at storage areas, railway yards or harbours; Marshalling yard installations** (transferring of refuse between vehicles or containers B65F 9/00; dredging, soil shifting E02F; conveyers used in co-operation with coal or like winning apparatus E21C 47/00)
- 63/02 • with essentially-horizontal transit otherwise than by bridge
- 63/04 • with essentially-horizontal transit by bridges equipped with conveyers
- 63/06 • with essentially-vertical transit (hoppers B65D 88/26)
- 65/00 Loading or unloading** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; of vehicles B65G 67/00)
- 65/02 • Loading or unloading machines comprising essentially a conveyor for moving the loads associated with a device for picking-up the loads
- 65/04 • • with pick-up shovels (construction of shovels E02F)
- 65/06 • • with endless scraping or elevating pick-up conveyers
- 65/08 • • with reciprocating pick-up conveyers
- 65/10 • • • Raking or scraping devices
- 65/12 • • • operations at positions off-set from the conveyor centreline
- 65/14 • • with jiggling pick-up conveyers, e.g. duck-bills
- 65/16 • • with rotary pick-up conveyers
- 65/18 • • • Discs
- 65/20 • • • Paddle wheels
- 65/22 • • • Screws
- 65/23 • Devices for tilting and emptying of containers [3]
- 65/24 • • for manual tilting of barrels or casks [3]
- 65/28 • Piling or unpling loose materials in bulk, e.g. coal, manure, timber, not otherwise provided for (by soil-shifting or like equipment E02F)

- 65/30 • Methods or devices for filling or emptying bunkers, hoppers, tanks, or like containers, of interest apart from their use in particular chemical or physical processes or their application in particular machines, e.g. not covered by a single other subclass (devices for tilting and emptying containers B65G 65/23; such containers having means facilitating filling or emptying B65D 88/54) [3]

**Note(s)**

Methods or devices for filling bunkers, hoppers, or containers are only classified in group B65G 65/30 if they are of general application apart from their use in particular processes or their application in particular machines or if they are not covered by a single other subclass.

- 65/32 • • Filling devices (pneumatic conveyers B65G 51/00, B65G 53/00)
- 65/34 • • Emptying devices (conveyer construction B65G 15/00-B65G 35/00; devices similar to vehicle tipplers B65G 67/48)
- 65/36 • • • Devices for emptying from the top
- 65/38 • • • • Mechanical devices
- 65/40 • • • Devices for emptying otherwise than from the top
- 65/42 • • • • using belt or chain conveyers
- 65/44 • • • • using reciprocating conveyers, e.g. jiggling conveyers
- 65/46 • • • • using screw conveyers
- 65/48 • • • • using other rotating means, e.g. rotating pressure sluices in pneumatic systems

- 67/00 Loading or unloading vehicles** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; by means incorporated in the vehicles B60-B64; ground or aircraft-carrier-deck installations B64F; transferring of refuse between vehicles or containers B65F 9/00)

- 67/02 • Loading or unloading land vehicles
- 67/04 • • Loading land vehicles
- 67/06 • • • Feeding articles or materials from bunkers or funnels
- 67/08 • • • using endless conveyers
- 67/10 • • • using conveyers covering the whole length of vehicle trains
- 67/12 • • • Loading elongated articles, e.g. rails, logs
- 67/14 • • • Loading hardened bricks, briquettes, or the like
- 67/16 • • • Loading coke-oven products (discharging coke ovens C10B 33/00)
- 67/18 • • • Refuelling locomotives with solid fuels (servicing locomotives B61K 11/02)
- 67/20 • • • Loading covered vehicles
- 67/22 • • • Loading moving vehicles
- 67/24 • • Unloading land vehicles
- 67/26 • • • using rakes or scrapers
- 67/28 • • • • External transverse blades attached to endless conveyers
- 67/30 • • • using transportable tipping apparatus
- 67/32 • • • using fixed tipping installations
- 67/34 • • • • Apparatus for tipping wagons or mine cars (inverting wagons B65G 67/48; platform-lifts with tiltable platforms B66F 7/22)

- 67/36 • • • • • endwise
- 67/38 • • • • • comprising a turntable
- 67/40 • • • • • toward one end only
- 67/42 • • • • • sideways
- 67/44 • • • • • by passing the vehicles over a stretch of transversely-inclined rails
- 67/46 • • • • • Apparatus for lifting and tilting
- 67/48 • • • • Vehicle tipplers (devices for washing or cleaning railroad vehicles B60S)
- 67/50 • • • • • Rotary vehicle tipplers, i.e. rotating through 360°
- 67/52 • • • • • having several decks
- 67/54 • • • • • Vehicle-locking means
- 67/56 • • • • • Vehicle and tippler interlocking controls
- 67/60 • Loading or unloading ships (B65G 67/02 takes precedence; arrangement of ship-based loading or unloading equipment for cargo or passengers B63B 27/00) [3]
- 67/62 • • using devices influenced by the tide or by the movements of the ship, e.g. devices on pontoons (horizontal loading or unloading platforms B65G 69/22; loading ramps B65G 69/28) [3]

- 69/00 Auxiliary measures taken, or devices used, in connection with loading or unloading** (by means incorporated in, or operatively associated with, conveyers B65G 47/00; preventing, minimising, or fighting fire A62C; in vehicles, see the relevant subclasses)

- 69/02 • Filling storage spaces as completely as possible, e.g. application of vibrators
- 69/04 • Spreading-out the materials conveyed over the whole surface to be loaded; Trimming heaps of loose materials
- 69/06 • Fluidising
- 69/08 • Devices for emptying storage spaces as completely as possible (devices preventing the formation of bridges B65D 88/64)
- 69/10 • Obtaining an average product from stored bulk material (for measuring or testing G01)
- 69/12 • Sieving bulk materials during loading or unloading
- 69/14 • Pulverising loaded or unloaded materials
- 69/16 • Preventing pulverisation, deformation, breakage, or other mechanical damage to the goods or materials
- 69/18 • Preventing escape of dust
- 69/20 • Auxiliary treatments, e.g. aerating, heating, humidifying, de-aerating, cooling, de-watering, or drying, during loading or unloading; Loading or unloading in a fluid medium other than air
- 69/22 • Horizontal loading or unloading platforms (pile tables B65H; as road or railway equipment E01F 1/00)
- 69/24 • • having platform-level adjusting means
- 69/26 • • Rotatable platforms
- 69/28 • Loading ramps; Loading docks (as road or railway equipment E01F 1/00) [1, 2006.01]
- 69/30 • • Non-permanently installed loading ramps, e.g. transportable [2006.01]
- 69/32 • • Shelters, surrounds or sealing arrangements for loading docks [2006.01]
- 69/34 • • Accessories, e.g. vehicle restrainers, wheel blockers, positioners or bumpers [2006.01]



**B65H HANDLING THIN OR FILAMENTARY MATERIAL, e.g. SHEETS, WEBS, CABLES****Note(s)**

1. This subclass does not cover methods or devices intimately associated with other operations on thin or filamentary material, e.g. sheets, webs, cables or means for performing such operations, which are classified in the relevant subclasses for these operations, e.g.:
  - B07C.....Postal sorting, similar sorting of documents, e.g. cheques
  - B08B 1/02.....Cleaning travelling work, e.g. webs, by methods involving the use of tools, brushes or like members
  - B21B 41/00.....Metal rolling involving guiding, conveying or accumulating easily-flexible work, e.g. wire, sheet metal bands, in loops or curves
  - B21C 47/00, B21C 49/00.....Winding-up, coiling, winding-off or temporarily accumulating metal wire, metal band or other flexible metal material, characterised by features relevant to metal processing only, other than by rolling
  - B21D 43/00.....Feeding, positioning or storing devices, combined with, or arranged in, or specially adapted for use in connection with, apparatus for working or processing sheet metal without essentially removing material
  - B23K 9/12.....Means for automatic feeding of electrodes for spot or seam welding or cutting
  - B29C 31/00.....Handling for shaping or joining of plastics, for shaping of substances in a plastic state in general or for after-treatment of shaped products, e.g. feeding the material to be shaped
  - B41B 15/32, B41B 21/32.....Film-handling mechanisms in photographic composing machines
  - B41F 13/02.....Conveying or guiding webs through rotary-printing presses or machines
  - B41J 11/00-B41J 17/00.....Handling of copy- or impression-transfer material in typewriters or selective printing mechanisms
  - B41K 3/44.....Means for handling copy matter in stamping or numbering apparatus or devices
  - B41L.....Handling sheets or webs in apparatus or devices for manifolding, duplicating or printing for office or other commercial purposes, or on addressing machines or like series-printing machines
  - B42B.....Handling relating to permanently attaching together sheets, quires, or signatures
  - B42C.....Handling sheets in book-binding
  - B65B.....Handling of sheets or webs in apparatus for, or methods of, packaging articles, not of interest apart from their application in packaging machines
  - B65C.....Handling of labels in labelling or tagging apparatus
  - C14B 1/62.....Winding or stacking hides or leather in machines or devices for manufacturing leather
  - D01-D07.....Spinning, weaving, braiding, lace-making, knitting, sewing, making ropes or cables
  - D21F 2/00.....Transferring webs from wet ends to press sections in paper-making
  - F26B 13/00.....Handling fabrics, fibres, yarns or other material in long lengths in drying apparatus
  - G03B.....Film-strip handling or handling of pictures in apparatus for taking photographs or for projecting or viewing them
  - G06K 13/00.....Conveying record carriers from one station to another
  - G06M 7/00.....Counting of flat articles, e.g. sheets, carried by a conveyer
  - G11B 15/00-G11B 19/00, G11B 23/00, G11B 25/00.....Information storage based on relative movement between record carrier and transducer, involving handling record carriers for recording or reproducing
  - H01F 41/06.....Manufacturing coils for magnets, inductances, transformers, by winding
  - H01G 13/02.....Machines for winding capacitors
  - H04N 1/00.....Sheet handling not of interest apart from its use in systems for transmission or reproduction of pictures or patterns not varying in time, e.g. facsimile transmission.
2. In this subclass:
  - the groups relating to thin material, as defined under (i) of Note (3) below, are primarily intended to cover the handling of articles made of paper or cardboard, but also include the handling of articles made of other materials which have similar characteristics or present similar handling problems, e.g. articles made of sheet-plastics or leather;
  - the groups relating to filamentary material (groups B65H 49/00 onwards), as defined in Note (3) below, cover only methods or devices of general application or interest.
3. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "handling" includes feeding, folding (other than in the manufacture of products), guiding, orientating, storing, unwinding, and winding;
  - "thin material" includes:
    - i. sheets, signatures, envelopes, blanks, and thin piles thereof (hereinafter referred to as "articles"), and
    - ii. webs, tapes, and films, e.g. of paper, fabric, metal foil, or plastics;
  - "filamentary material" includes thread, wires, ropes, cables, and hoses;
  - "package" means a mass of filamentary material, formed by coiling, depositing, or winding, with or without a supporting core or former or an enclosing container or receptacle.

**Subclass index****ARTICLES**

## Feeding; piles

pile supports; lifting ends of piles for overlapping; overturning articles.....1/00, 13/00, 15/00

separating from piles; feeding from piles or to machines; feed control; positioning; feeding to piles;

feed tables.....3/00, 5/00, 7/00, 9/00, 11/00

## Delivering

from machines to piles.....29/00, 35/00, 37/00

gathering.....	39/00
folding; unfolding.....	45/00, 47/00
piling.....	13/00, 15/00, 31/00, 33/00
Combinations of piling and depiling operations.....	83/00
Recirculating articles.....	85/00
Control, checking, safety.....	43/00
<b>WEBS</b>	
<b>Feeding</b>	
unwinding, paying-out webs; winding webs; advancing webs.....	16/00, 18/00, 20/00
changing the web roll; special constructions of feed or guide rollers; covering cores, not otherwise provided for.....	19/00, 27/00, 81/00
webs: splicing; registering, tensioning or guiding; con- trolling tension.....	21/00, 23/00, 77/00
<b>Delivery from machines</b>	
with or after auxiliary operations; gathering; separating.....	35/00, 37/00, 39/00, 41/00
folding; unfolding.....	45/00, 47/00
Machines: control, checking, safety or warning; driving gear not otherwise provided for.....	26/00, 43/00, 63/00, 79/00
Storing.....	75/00
<b>FILAMENTARY MATERIAL</b>	
Unwinding, paying out; forwarding.....	49/00, 51/00
Winding, coiling, depositing; wound packages; guides; covering cores not otherwise provided for.....	54/00, 55/00, 57/00, 81/00
Tension control; Measuring pre-determined lengths; joining.....	59/00, 77/00, 61/00, 69/00
Cores, formers: securing material, replacing, removing, stripping-off waste material.....	65/00, 67/00, 73/00
Treatment during formation of package.....	71/00
Machines: control, checking, safety or warning; driving gear not otherwise provided for.....	26/00, 43/00, 63/00, 79/00
Storing.....	75/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

**Feeding articles to machines; Separating articles from piles; Pile supports**

- 1/00 Supports or magazines for piles from which articles are to be separated** (carriers used for associating, collating, or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)
- 1/02 • adapted to support articles on edge
- 1/04 • adapted to support articles substantially horizontally, e.g. for separation from top of pile
- 1/06 • • for separation from bottom of pile
- 1/08 • with means for advancing the pile to present the articles to a separating device (pressing on piles from which articles are separated from the bottom B65H 1/06)
- 1/10 • • comprising weights
- 1/12 • • comprising springs
- 1/14 • • comprising positively-acting mechanical devices
- 1/16 • • comprising pneumatic or hydraulic means
- 1/18 • • controlled by height of pile
- 1/20 • • controlled by weight of pile; Floating arrangements
- 1/22 • • moving in direction of plane of articles, e.g. for bodily advancement of fanned-out piles
- 1/24 • • with means for relieving or controlling pressure of the pile
- 1/26 • with auxiliary supports to facilitate introduction or renewal of the pile
- 1/28 • compartmented to receive piles side by side
- 1/30 • with means for replenishing the pile during continuous separation of articles therefrom

- 3/00 Separating articles from piles** (associating, collating, or gathering articles B65H 39/00; machines for separating superposed webs B65H 41/00; unpiling thin material combined with folding B65H 45/26; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)
- 3/02 • using friction forces between articles and separator
- 3/04 • • Endless-belt separators
- 3/06 • • Rollers or like rotary separators
- 3/08 • using pneumatic force
- 3/10 • • Suction rollers
- 3/12 • • Suction bands, belts, or tables moving relatively to the pile
- 3/14 • • Air blasts producing partial vacuum
- 3/16 • using magnetic force
- 3/18 • using electrostatic force
- 3/20 • using adhesives
- 3/22 • by needles or the like engaging the articles
- 3/24 • by pushers engaging the edges of the articles
- 3/26 • by separators engaging folds, flaps, or projections of articles
- 3/28 • by screw or like separators
- 3/30 • by escapement devices (screw or like separators B65H 3/28); from staggered piles; from piles of articles having staggered formations, e.g. cuts or perforations
- 3/32 • by elements, e.g. fingers, plates, rollers, inserted or traversed between articles to be separated and remainder of the pile (such elements acting only as supplementary devices to assist separation or prevent double feed B65H 3/50)
- 3/34 • Article-retaining devices controlling the release of the articles to the separators
- 3/36 • by separators moved in special paths, e.g. enclosing an area

- 3/38 • • the paths not enclosing an area
- 3/40 • by two or more separators acting alternately on the same pile (rotary or oscillating bodies carrying two or more separators B65H 3/42)
- 3/42 • by two or more separators mounted for movement with, or relative to, rotary or oscillating bodies
- 3/44 • Simultaneously, alternately, or selectively separating articles from two or more piles
- 3/46 • Supplementary devices or measures to assist separation or prevent double feed (control means comprising detectors responsive to double feed B65H 7/12)
- 3/48 • • Air blast acting on edges of, or under, articles
- 3/50 • • Elements, e.g. fingers, plates, rollers, inserted or traversed between articles to be separated and remainder of the pile
- 3/52 • • Friction retainers acting on under or rear side of article being separated
- 3/54 • • Pressing or holding devices
- 3/56 • • Elements, e.g. scrapers, fingers, needles, brushes, acting on separated article or on edge of the pile
- 3/58 • • Articles spiked, threaded, cemented, or gummed together, to prevent double feed, e.g. piles with gummed edges
- 3/60 • • Loosening articles in piles
- 3/62 • • • by swinging, agitating, or knocking the pile
- 3/64 • • • by vacuum apparatus
- 3/66 • Article guides or smoothers, e.g. movable in operation
- 3/68 • • immovable in operation
- 5/00 Feeding articles separated from piles; Feeding articles to machines** (identical mechanisms or parts for delivering or advancing articles from machines B65H 29/00; recirculating articles B65H 85/00)
- 5/02 • by belts or chains
- 5/04 • by movable tables or carriages (rotary tables B65H 5/18)
- 5/06 • by rollers
- 5/08 • by grippers, e.g. suction grippers
- 5/10 • • Reciprocating or oscillating grippers
- 5/12 • • Revolving grippers, e.g. mounted on arms, frames, or cylinders
- 5/14 • • Details of grippers; Actuating mechanisms therefor
- 5/16 • by pusher, needles, friction, or like devices adapted to feed single articles along a surface or table
- 5/18 • by rotary dials or tables
- 5/20 • by dropping-roller or like device
- 5/22 • by air-blast or suction device (suction grippers B65H 5/08)
- 5/24 • Feeding streams of overlapping articles
- 5/26 • Duplicate, alternate, selective, or coacting feeds
- 5/28 • Feeding articles stored in rolled or folded bands
- 5/30 • Opening devices for folded sheets or signatures
- 5/32 • Saddle-like members over which partially-unfolded sheets or signatures are fed to signature-gathering, stitching, or like machines
- 5/34 • Varying the phase of feed relative to the receiving machine
- 5/36 • Article guides or smoothers, e.g. movable in operation
- 5/38 • • immovable in operation

**7/00 Controlling article feeding, separating, pile-advancing, or associated apparatus, to take account of incorrect feeding, absence of articles, or presence of faulty articles**

- 7/02 • by feelers or detectors
- 7/04 • • responsive to absence of articles, e.g. exhaustion of pile (B65H 7/14 takes precedence)
- 7/06 • • responsive to presence of faulty articles or incorrect separation or feed (B65H 7/14 takes precedence)
- 7/08 • • • responsive to incorrect front register
- 7/10 • • • responsive to incorrect side register (controlling transverse register of webs B65H 23/032)
- 7/12 • • • responsive to double feed or separation
- 7/14 • • by photoelectric feelers or detectors
- 7/16 • Controlling air-supply to pneumatic separators
- 7/18 • Modifying or stopping actuation of separators
- 7/20 • Controlling associated apparatus

**9/00 Registering, e.g. orientating, articles; Devices therefor**

- 9/02 • Gauge pins
- 9/04 • Fixed or adjustable stops or gauges (gauge pins B65H 9/02)
- 9/06 • Movable stops or gauges, e.g. rising and falling front stops
- 9/08 • Holding devices, e.g. finger, needle, suction, for retaining articles in registered position
- 9/10 • Pusher or like movable registers; Pusher or gripper devices which move articles into registered position
- 9/12 • carried by article grippers
- 9/14 • Retarding or controlling the forward movement of articles as they approach stops
- 9/16 • Inclined tape, roller, or like article-forwarding side registers
- 9/18 • Assisting by devices such as reflectors, lenses, transparent sheets, or mechanical indicators
- 9/20 • Assisting by photoelectric, sonic, or pneumatic indicators

**11/00 Feed tables**

- 11/02 • angularly adjustable in plane of articles

**13/00 Lifting the ends of piles to facilitate the formation of overlapped piles**

**15/00 Overturning articles [4]**

- 15/02 • Overturning piles [4]

**Feeding webs to or from machines; Winding or unwinding webs; Splicing webs**

**16/00 Unwinding, paying-out webs [4]**

- 16/02 • Supporting web roll [4]
- 16/04 • • cantilever type [4]
- 16/06 • • both-ends type [4]
- 16/08 • • parallel rollers type [4]
- 16/10 • Arrangements for effecting positive rotation of web roll [4]

**18/00 Winding webs [4]**

- 18/02 • Supporting web roll [4]
- 18/04 • • Interior-supporting [4]
- 18/06 • • Lateral-supporting [4]

- 18/08 • Web-winding mechanisms [4]
- 18/10 • • Mechanisms in which power is applied to web-roll spindle [4]
- 18/12 • • • to effect step-by-step advancement of web [4]
- 18/14 • • Mechanisms in which power is applied to web roll, e.g. to effect continuous advancement of web [4]
- 18/16 • • • by friction roller [4]
- 18/18 • • • • to effect step-by-step advancement of web [4]
- 18/20 • • • the web roll being supported on two parallel rollers at least one of which is driven [4]
- 18/22 • • • by friction band [4]
- 18/24 • • • • to effect step-by-step advancement of web [4]
- 18/26 • • Mechanisms for controlling contact pressure on winding-web package, e.g. for regulating the quantity of air between web layers [4]
- 18/28 • Wound package of webs [4]
- 19/00 Changing the web roll [4]**
- 19/10 • in unwinding mechanisms or in connection with unwinding operations [4]
- 19/12 • • Lifting, transporting, or inserting the web roll; Removing empty core [4]
- 19/14 • • Accumulating surplus web for advancing to machine while changing the web roll [4]
- 19/16 • • Driving, e.g. accelerating, the replacement web roll in association with web-splicing operation [4]
- 19/18 • • Attaching, e.g. pasting, the replacement web to the expiring web [4]
- 19/20 • • Cutting-off the expiring web [4]
- 19/22 • in winding mechanisms or in connection with winding operations [4]
- 19/24 • • Accumulating surplus web delivered while changing the web roll [4]
- 19/26 • • Cutting-off the web running to the wound web roll [4]
- 19/28 • • Attaching the leading end of the web to the replacement web-roll core or spindle (cores, formers, supports or holders, e.g. reels, with arrangements for securing ends of material B65H 75/28) [4]
- 19/29 • • Securing the trailing end of the wound web to the web roll (cores, formers, supports or holders, e.g. reels, with arrangements for securing ends of material B65H 75/28) [4]
- 19/30 • • Lifting, transporting, or removing the web roll; Inserting core [4]
- 20/00 Advancing webs (web-delivering apparatus incorporating devices for performing auxiliary operations B65H 35/00, B65H 37/00) [4]**
- 20/02 • by friction roller [4]
- 20/04 • • to effect step-by-step advancement of web [4]
- 20/06 • by friction band [4]
- 20/08 • • to effect step-by-step advancement of web [4]
- 20/10 • by a feed band against which web is held by fluid pressure, e.g. suction or air blast [4]
- 20/12 • by suction roller [4]
- 20/14 • by direct action on web of moving fluid [4]
- 20/16 • by web-gripping means, e.g. grippers, clips [4]
- 20/18 • • to effect step-by-step advancement of web [4]
- 20/20 • by web-penetrating means, e.g. pins [4]
- 20/22 • • to effect step-by-step advancement of web [4]
- 20/24 • by looping or like devices [4]
- 20/26 • Mechanisms for advancing webs to or from the inside of web rolls [4]
- 20/28 • Mechanisms for delivering webs in superposed folds and refeeding them from the lower end of the folded assemblies [4]
- 20/30 • Arrangements for accumulating surplus web (while changing the web roll B65H 19/14, B65H 19/24) [4]
- 20/32 • • by making loops [4]
- 20/34 • • • with rollers [4]
- 20/36 • having means to optionally advance the web either in one longitudinal direction or in the opposite longitudinal direction [4]
- 20/38 • • by changing the direction of mechanism driving the web-roll spindle [4]
- 20/40 • • by changing the direction of mechanism driving the pinch roller [4]
- 21/00 Apparatus for splicing webs (during web-roll changing B65H 19/00; associating two or more webs B65H 39/16)**
- 21/02 • for premarked, e.g. preprinted, webs
- 23/00 Registering, tensioning, smoothing, or guiding webs (registering articles B65H 9/00; in connection with splicing B65H 21/00; tensioning devices of general interest in connection with the handling of webs, tapes, or filamentary materials B65H 77/00)**
- 23/02 • transversely (by tentering, gripper, or like apparatus operating on fabric webs D06C)
- 23/022 • • by tentering devices [4]
- 23/025 • • • by rollers [4]
- 23/028 • • • by clips [4]
- 23/032 • • Controlling transverse register of web [4]
- 23/035 • • • by guide bars [4]
- 23/038 • • • by rollers [4]
- 23/04 • longitudinally
- 23/06 • • by retarding devices, e.g. acting on web-roll spindle
- 23/08 • • • acting on web roll being unwound
- 23/10 • • • acting on running web (by fluid action B65H 23/24)
- 23/12 • • • • and causing parts thereof to move in opposite directions and in frictional engagement
- 23/14 • • • • Tensioning rollers applying braking forces
- 23/16 • • by weighted or spring-pressed movable bars or rollers
- 23/18 • • by controlling or regulating the web-advancing mechanism, e.g. mechanism acting on the running web
- 23/182 • • • in unwinding mechanisms or in connection with unwinding operations [4]
- 23/185 • • • • motor-controlled [4]
- 23/188 • • • in connection with running-web [4]
- 23/192 • • • • motor-controlled [4]
- 23/195 • • • in winding mechanisms or in connection with winding operations [4]
- 23/198 • • • • motor-controlled [4]
- 23/24 • • by fluid action, e.g. to retard the running web [4]
- 23/26 • • by transverse stationary or adjustable bars or rollers
- 23/28 • • by longitudinally-extending strips, tubes, plates, or wires (flexible tapes or bands B65H 23/30)
- 23/30 • • by longitudinally-extending flexible tapes or bands
- 23/32 • • Arrangements for turning or reversing webs
- 23/34 • • Apparatus for taking-out curl from webs

- 26/00 Warning or safety devices, e.g. automatic fault detectors, stop-motions, for web-advancing mechanisms** (safety devices in general F16P; investigating chemical or physical properties of materials in general G01N; indicating devices in general G08B) [4]
- 26/02 • responsive to presence of irregularities in running webs [4]
- 26/04 • • for variation in tension [4]
- 26/06 • responsive to predetermined lengths of webs [4]
- 26/08 • responsive to a predetermined diameter [4]
- 27/00 Special constructions, e.g. surface features, of feed or guide rollers for webs** (rollers in general F16C 13/00)

**Delivering articles from machines; Piling articles; Article or web delivery apparatus incorporating devices for performing specified auxiliary operations; Associating or gathering articles or webs; Machines for separating superposed webs**

- 29/00 Delivering or advancing articles from machines; Advancing articles to or into piles** (associating, collating or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00; recirculating articles B65H 85/00; for articles other than those defined by Note (3) (i) of this subclass, see B65G)
- 29/02 • by mechanical grippers engaging the leading edge only of the articles
- 29/04 • • the grippers being carried by endless chains or bands
- 29/06 • • the grippers being carried by rotating members
- 29/08 • • the grippers being oscillated in arcuate paths
- 29/10 • • the grippers being reciprocated in rectilinear paths
- 29/12 • by means of the nip between two, or between two sets of, moving tapes or bands
- 29/14 • • and introducing into a pile
- 29/16 • by contact of one face only with moving tapes, bands, or chains
- 29/18 • • and introducing into a pile
- 29/20 • by contact with rotating friction members, e.g. rollers, brushes, or cylinders
- 29/22 • • and introducing into a pile
- 29/24 • by air-blast or suction apparatus (dropping articles from suction carriers B65H 29/32)
- 29/26 • by dropping
- 29/28 • • from mechanical grippers (grippers engaging the leading edge only B65H 29/02)
- 29/30 • • from magnetic holders
- 29/32 • • from pneumatic, e.g. suction, carriers
- 29/34 • • from supports slid from under the articles
- 29/36 • • from tapes, bands, or rollers rolled from under the articles
- 29/38 • by movable piling or advancing arms, frames, plates, or like members with which the articles are maintained in face contact
- 29/40 • • Members rotated about an axis perpendicular to direction of article movement, e.g. star-wheels formed by S-shaped members
- 29/42 • • Members rotated about an axis parallel to direction of article movement, e.g. helices
- 29/44 • • Members oscillated in arcuate paths
- 29/46 • • Members reciprocated in rectilinear path
- 29/48 • by tables arranged to be tilted to cause sliding of articles

- 29/50 • Piling apparatus of which the discharge point moves in accordance with the height of the pile
- 29/51 • • piling by collecting on the periphery of cylinders [3]
- 29/52 • Stationary guides or smoothers
- 29/54 • Article strippers, e.g. for stripping from advancing elements
- 29/56 • • for stripping from elements of machines
- 29/58 • Article switches or diverters
- 29/60 • • diverting the stream into alternative paths (B65H 29/62 takes precedence)
- 29/62 • • diverting faulty articles from the main stream (control devices detecting faulty articles B65H 43/04)
- 29/64 • • directing the components of composite articles into separate paths
- 29/66 • Advancing in streams of overlapping articles
- 29/68 • Reducing the speed of articles as they advance (web retarding devices B65H 23/06)
- 29/70 • Article-bending or stiffening arrangements
- 31/00 Pile receivers** (carriers used for associating, collating, or gathering articles B65H 39/00; combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00)
- 31/02 • with stationary end support against which pile accumulates
- 31/04 • with movable end support arranged to recede as pile accumulates
- 31/06 • • the articles being piled on edge
- 31/08 • • the articles being piled one above another
- 31/10 • • • and applied at the top of the pile
- 31/12 • • Devices relieving the weight of the pile or permitting or effecting movement of the pile end support during piling
- 31/14 • • • Springs (fluid springs B65H 31/16)
- 31/16 • • • Fluid-pressure devices
- 31/18 • • • Positively-acting mechanical devices
- 31/20 • adjustable for different article sizes
- 31/22 • removable or interchangeable
- 31/24 • multiple or compartmented, e.g. for alternate, programmed, or selective filling
- 31/26 • Auxiliary devices for retaining articles in the pile
- 31/28 • Bands, chains, or like moving receivers (for articles piled on edge B65H 31/06)
- 31/30 • Arrangements for removing completed piles (bands, chains, or like moving receivers B65H 31/28)
- 31/32 • Auxiliary devices for receiving articles during removal of a completed pile
- 31/34 • Apparatus for squaring-up piled articles
- 31/36 • • Auxiliary devices for contacting each article with a front stop as it is piled
- 31/38 • • Apparatus for vibrating or knocking the pile during piling
- 31/40 • • Separate receivers, troughs, and like apparatus for knocking-up completed piles
- 33/00 Forming counted batches in delivery pile or stream of articles**
- 33/02 • by moving a blade or like member into the pile
- 33/04 • by inserting marker slips in pile or stream
- 33/06 • by displacing articles to define batches
- 33/08 • • Displacing whole batches, e.g. forming stepped piles
- 33/10 • • Displacing the end articles of a batch
- 33/12 • by creating gaps in the stream

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- 33/14 • by diverting batches to separate receivers
- 33/16 • by depositing articles in batches on moving supports
- 33/18 • • with separators between adjacent batches
- 35/00 Delivering articles from cutting or line-perforating machines; Article or web delivery apparatus incorporating cutting or line-perforating devices, e.g. adhesive tape dispensers** (cutting or perforating machines or devices in general B26D, B26F)
  - 35/02 • from or with longitudinal slitters or perforators
  - 35/04 • from or with transverse cutters or perforators
  - 35/06 • • from or with blade, e.g. shear-blade, cutters or perforators (from or with revolving blade B65H 35/08)
  - 35/07 • • • Adhesive-tape dispensers [3]
  - 35/08 • • from or with revolving, e.g. cylinder, cutters or perforators
  - 35/10 • from or with devices for breaking partially-cut or perforated webs, e.g. bursters
- 37/00 Article or web delivery apparatus incorporating devices for performing specified auxiliary operations** (incorporating cutting or line-perforating devices B65H 35/00)
  - 37/02 • for applying adhesive (and securing together B65H 37/04)
  - 37/04 • for securing together articles or webs, e.g. by adhesive, stitching, or stapling (adhering replacement to expiring web during change of web roll B65H 19/18) [2]
  - 37/06 • for folding
- 39/00 Associating, collating, or gathering articles or webs** (combinations of piling and depiling operations, of interest apart from the single operation of piling or depiling B65H 83/00; machines for both collating or gathering and permanently attaching together sheets or signatures B42C 1/00)
  - 39/02 • Associating, collating, or gathering articles from several sources
  - 39/04 • • from piles
  - 39/041 • • • the piles being disposed in rotary carriers [3]
  - 39/042 • • • the piles being disposed in superposed carriers [3]
  - 39/043 • • • the piles being disposed in juxtaposed carriers [3]
  - 39/045 • • • by collecting in rotary carriers [2]
  - 39/05 • • • by collecting in superposed carriers [2]
  - 39/055 • • • by collecting in juxtaposed carriers [2]
  - 39/06 • • from delivery streams
  - 39/065 • • • by collecting in rotary carriers [2]
  - 39/07 • • • by collecting in superposed carriers [2]
  - 39/075 • • • by collecting in juxtaposed carriers [2]
  - 39/10 • Associating articles from a single source, e.g. to form a writing pad
  - 39/105 • • in rotary carriers [3]
  - 39/11 • • in superposed carriers [3]
  - 39/115 • • in juxtaposed carriers [3]
  - 39/14 • Associating sheets with webs
  - 39/16 • Associating two or more webs
- 41/00 Machines for separating superposed webs**
- 43/00 Use of control, checking, or safety devices, e.g. automatic devices comprising an element for sensing a variable**

- 43/02 • detecting, or responding to, absence of articles (B65H 43/08 takes precedence)
- 43/04 • detecting, or responding to, presence of faulty articles (B65H 43/08 takes precedence; diverting faulty articles from main streams B65H 29/62)
- 43/06 • detecting, or responding to, completion of pile (B65H 43/08 takes precedence)
- 43/08 • Photoelectric devices

## Folding or unfolding thin material

- 45/00 Folding thin material** (specially adapted for the manufacture or treatment of particular products, see the relevant places, e.g. D06F 89/00) [4]
- 45/02 • Folding limp material without application of pressure to define or form crease lines (winding or unwinding fabrics for feeding to or from machines B65H 16/00-B65H 27/00; folding garments for packaging purposes B65B; folding fabrics in sewing machines D05B)
  - 45/04 • • Folding sheets
  - 45/06 • • Folding webs (B65H 20/28 takes precedence)
  - 45/08 • • • longitudinally
  - 45/09 • • • • Doubling, i.e. folding into half of width
  - 45/10 • • • transversely
  - 45/101 • • • • in combination with laying, i.e. forming a zig-zag pile
  - 45/103 • • • • • by a carriage which reciprocates above the laying station
  - 45/105 • • • • • coacting with fold holders
  - 45/107 • • • • • by means of swinging or reciprocating guide bars
  - 45/109 • • • • Registering or counting the folds; Detecting irregularities in the zig-zag pile
  - 45/12 • Folding articles or webs with application of pressure to define or form crease lines (B65H 20/28 takes precedence; pleating, kilting, or goffering textile fabrics D06J)
  - 45/14 • • Buckling folders
  - 45/16 • • Rotary folders
  - 45/18 • • Oscillating or reciprocating blade folders (carried on rotary members B65H 45/16)
  - 45/20 • • Zig-zag folders
  - 45/22 • • Longitudinal folders, i.e. for folding moving sheet material parallel to the direction of movement
  - 45/24 • • Interfolding sheets, e.g. cigarette or toilet papers
  - 45/26 • • Folding in combination with unpiling (unpiling B65H 3/00)
  - 45/28 • • Folding in combination with cutting (cutting machines B26D)
  - 45/30 • • Folding in combination with creasing, smoothing, or application of adhesive (folding or adhesive-application in article or web delivering B65H 37/00)
- 47/00 Unfolding thin limp material** (B65H 20/28 takes precedence; opening devices for sheets or signatures B65H 5/30)

**Unwinding, paying-out, forwarding, winding, coiling, or depositing filamentary material**

- 49/00 Unwinding or paying-out filamentary material; Supporting, storing, or transporting packages from which filamentary material is to be withdrawn or paid-out** (winding B65H 54/00; flyers or other guides assisting paying-out B65H 57/00; bobbins, tubes, or other cores for packages B65H 75/00)
- 49/02 • Methods or apparatus in which packages do not rotate
- 49/04 • • Package-supporting devices
- 49/06 • • • for a single operative package
- 49/08 • • • • enclosing the package
- 49/10 • • • for one operative package and one or more reserve packages
- 49/12 • • • • the reserve packages being mounted to permit manual or automatic transfer to operating position
- 49/14 • • • for several operative packages
- 49/16 • • • • Stands for frameworks
- 49/18 • Methods or apparatus in which packages rotate (supports or holders, for storing and repeatedly paying-out and rewinding lengths of material provided for particular purposes B65H 75/34)
- 49/20 • • Package-supporting devices
- 49/22 • • • Overhead suspension devices
- 49/24 • • • Rollers
- 49/26 • • • Axial shafts or spigots
- 49/28 • • • Turntables
- 49/30 • • • Swifts or skein holders
- 49/32 • • • Stands or frameworks
- 49/34 • • Arrangements for effecting positive rotation of packages
- 49/36 • Securing packages to supporting devices (replacing or removing cores, receptacles, or completed packages at paying-out, winding, or depositing stations B65H 67/00)
- 49/38 • Skips, cages, racks, or containers, adapted solely for the transport or storage of bobbins, cops, or the like
- 51/00 Forwarding filamentary material** (stretch-spinning methods D01D 5/12; drawing or drafting rovings or the like D01H 5/00)
- 51/005 • Separating a bundle of forwarding filamentary materials into a plurality of groups [4]
- 51/01 • • by means of static electricity [4]
- 51/015 • Gathering a plurality of forwarding filamentary materials into a bundle [4]
- 51/02 • Rotary devices, e.g. with helical forwarding surfaces (devices for temporarily storing filamentary material during forwarding B65H 51/20; driven rotary devices for controlling tension B65H 59/18)
- 51/04 • • Rollers, pulleys, capstans, or intermeshing rotary elements
- 51/06 • • • arranged to operate singly
- 51/08 • • • arranged to operate in groups or in co-operation with other elements
- 51/10 • • • • with opposed coacting surfaces, e.g. providing nips
- 51/12 • • • • in spaced relation to provide a series of independent forwarding surfaces around which material is passed or wound
- 51/14 • Aprons, endless belts, lattices, or like driven elements
- 51/16 • Devices for entraining material by flow of liquids or gases, e.g. air-blast devices (blowing slag wool in molten state C03B 37/06)

- 51/18 • Gripping devices with linear motion
- 51/20 • Devices for temporarily storing filamentary material during forwarding, e.g. for buffer storage
- 51/22 • • Reels or cages, e.g. cylindrical, with storing and forwarding surfaces provided by rollers or bars
- 51/24 • • • with interdigitating bars
- 51/26 • • Rollers or bars mounted askew to facilitate movement of filamentary material along them, e.g. pairs of canted rollers
- 51/28 • Arrangements for initiating a forwarding operation
- 51/30 • Devices controlling the forwarding speed to synchronise with supply, treatment, or take-up apparatus (B65H 59/10, B65H 59/38 take precedence)
- 51/32 • Supporting or driving arrangements for forwarding devices
- 54/00 Winding, coiling, or depositing filamentary material** (cores, formers, holders, cans, or receptacles B65H 75/02; devices specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34)
- 54/02 • Winding and traversing material on to reels, bobbins, tubes, or like package cores or formers
- 54/04 • • for making packages with closely-wound convolutions
- 54/06 • • for making cross-wound packages
- 54/08 • • • Precision winding arrangements
- 54/10 • • for making packages of specified shapes or on specified types of bobbins, tubes, cores, or formers
- 54/12 • • • on flanged bobbins or spools (B65H 54/20 takes precedence)
- 54/14 • • • on tubes, cores, or formers having generally-parallel sides, e.g. cops or packages to be loaded into loom shuttles
- 54/16 • • • forming bottle bobbin packages
- 54/18 • • • forming spools to be loaded into sewing, lace, embroidery, or like machines
- 54/20 • • • forming multiple packages
- 54/22 • • Automatic winding machines, i.e. machines with servicing units for automatically performing end-finding, interconnecting of successive lengths of material, controlling or fault-detecting of the running material, and replacing or removing of full or empty cores
- 54/24 • • • having a plurality of winding units moving along an endless path past one or more fixed servicing units
- 54/26 • • • having one or more servicing units moving along a plurality of fixed winding units
- 54/28 • • Traversing devices; Package-shaping arrangements (arrangements for preventing ribbon winding B65H 54/38; grooved, slotted, or split drums for driving of packages B65H 54/46)
- 54/30 • • • with thread guides reciprocating or oscillating with fixed stroke
- 54/32 • • • with thread guides reciprocating or oscillating with variable stroke
- 54/34 • • • for laying subsidiary winding, e.g. transfer tails
- 54/36 • • • Yarn-guide advancing or raising mechanisms, e.g. cop-building arrangements
- 54/38 • • Arrangements for preventing ribbon winding
- 54/40 • • Arrangements for rotating packages
- 54/42 • • • in which the package, core, or former is rotated by frictional contact of its periphery with a driving surface

- 54/44 • • • in which the package, core, or former is engaged with, or secured to, a driven member rotatable about the axis of the package
- 54/46 • • • Package drive drums
- 54/48 • • • • Grooved drums
- 54/50 • • • • Slotted or split drums
- 54/52 • • • Drive contact pressure control, e.g. pressing arrangements
- 54/54 • • • Arrangements for supporting cores or formers at winding stations; Securing cores or formers to driving members
- 54/547 • • • • Cantilever supporting arrangements [4]
- 54/553 • • • • Both-ends supporting arrangements [4]
- 54/56 • Winding of hanks or skeins
- 54/58 • • Swifts or reels adapted solely for the formation of hanks or skeins (B65H 49/30 takes precedence)
- 54/60 • • Devices for domestic use
- 54/62 • • Binding of skeins
- 54/64 • Winding of balls; Forming hollow objects by winding on to fusible or soluble cores, e.g. forming pressure vessels
- 54/66 • • Winding yarns into balls
- 54/68 • Winding on to cards or other flat cores, e.g. of star form
- 54/70 • Other constructional features of yarn-winding machines
- 54/71 • • Arrangements for severing filamentary materials [4]
- 54/72 • • Framework; Casings; Coverings
- 54/74 • • Driving arrangements (arrangements for preventing ribbon winding B65H 54/38; arrangements for rotating packages B65H 54/40)
- 54/76 • Depositing materials in cans or receptacles
- 54/78 • • Apparatus in which the depositing device or the receptacle is reciprocated
- 54/80 • • Apparatus in which the depositing device or the receptacle is rotated
- 54/82 • • • and in which coils are formed before deposition
- 54/84 • • Arrangements for compacting materials in receptacles
- 54/86 • Arrangements for taking-up waste material before or after winding or depositing
- 54/88 • • by means of pneumatic arrangements, e.g. suction guns [4]
- 55/00 Wound packages of filamentary material**
- 55/02 • Self-supporting packages
- 55/04 • characterised by method of winding
- 57/00 Guides for filamentary materials; Supports therefor**
- 57/02 • Stationary rods or plates
- 57/04 • Guiding surfaces within slots or grooves
- 57/06 • Annular guiding surfaces; Eyes, e.g. pigtails
- 57/08 • • formed of wire or the like
- 57/10 • • with flared apertures
- 57/12 • Tubes
- 57/14 • Pulleys, rollers, or rotary bars
- 57/16 • formed to maintain a plurality of filaments in spaced relation
- 57/18 • mounted to facilitate unwinding of material from packages
- 57/20 • • Flyers (for inserting twist D01H)
- 57/22 • adapted to prevent excessive ballooning of material
- 57/24 • with wear-resistant surfaces
- 57/26 • Supports for guides
- 57/28 • Reciprocating or oscillating guides (traversing devices for winding, coiling, or depositing filamentary material B65H 54/28)
- 59/00 Adjusting or controlling tension in filamentary material, e.g. for preventing snarling; Applications of tension indicators** (tensioning devices of general interest in connection with the handling of webs, tapes, or filamentary material B65H 77/00)
- 59/02 • by regulating delivery of material from supply package (by contact of package with support B65H 49/02; by controlling speed of driving mechanism of unwinding or paying-out devices B65H 59/38)
- 59/04 • • by devices acting on package or support
- 59/06 • • by devices acting on material leaving the package
- 59/08 • by contact of running length of material with supply package
- 59/10 • by devices acting on running material and not associated with supply or take-up devices (by controlling speed of driving mechanism of material-forwarding devices B65H 59/38)
- 59/12 • • Stationary elements arranged to deflect material from straight path
- 59/14 • • • and provided with surfaces imposing additional retarding forces on material
- 59/16 • • Braked elements rotated by material
- 59/18 • • Driven rotary elements (material-forwarding devices B65H 51/00)
- 59/20 • • Co-operating surfaces mounted for relative movement
- 59/22 • • • and arranged to apply pressure to material
- 59/24 • • • • Surfaces movable automatically to compensate for variation in tension
- 59/26 • • • and arranged to deflect material from straight path
- 59/28 • • • • the surfaces being urged towards each other
- 59/30 • • • • Surfaces movable automatically to compensate for variation in tension
- 59/32 • • • • the surfaces being urged away from each other
- 59/34 • • • • Surfaces movable automatically to compensate for variation in tension
- 59/36 • • Floating elements compensating for irregularities in supply or take-up of material (buffer storage devices B65H 51/20)
- 59/38 • by regulating speed of driving mechanism of unwinding, paying-out, forwarding, winding, or depositing devices, e.g. automatically in response to variations in tension
- 59/40 • Applications of tension indicators
- 61/00 Applications of devices for metering predetermined lengths of running material** (of general application G01B)
- 63/00 Warning or safety devices for use when unwinding, paying-out, forwarding, winding, coiling, or depositing filamentary material, e.g. automatic fault detectors or stop-motions** (safety devices in general F16P; indicating devices in general G08B)
- 63/02 • responsive to reduction in tension, failure of supply, or breakage, of material
- 63/024 • • responsive to breakage of materials [4]
- 63/028 • • • characterised by the detecting or sensing element [4]
- 63/032 • • • • electrical or pneumatic [4]



- 63/036 • • • characterised by the combination of the detecting or sensing elements with other devices, e.g. stopping devices for material advancing or winding mechanism [4]
- 63/04 • responsive to excessive tension or irregular operation of apparatus
- 63/06 • responsive to presence of irregularities in running material, e.g. for severing the material at irregularities
- 63/08 • responsive to delivery of a measured length of material, completion of winding of a package, or filling of a receptacle
- 65/00 Securing material to cores or formers** (arrangements for securing ends of material to cores, formers, supports or holders, e.g. reels, B65H 75/28) [3]
- 67/00 Replacing or removing cores, receptacles, or completed packages at paying-out, winding, or depositing stations**
- 67/02 • Arrangements for removing spent cores or receptacles and replacing by supply packages at paying-out stations (supports for packages B65H 49/04, B65H 49/20)
- 67/04 • Arrangements for removing completed take-up packages and replacing by cores, formers, or empty receptacles at winding or depositing stations; Transferring material between adjacent full and empty take-up elements
- 67/044 • • Continuous winding apparatus for winding on two or more winding heads in succession [4]
- 67/048 • • • having winding heads arranged on rotary capstan head [4]
- 67/052 • • • having two or more winding heads arranged in parallel to each other [4]
- 67/056 • • • having two or more winding heads arranged in series with each other [4]
- 67/06 • Supplying cores, receptacles, or packages to, or transporting from, winding or depositing stations
- 67/08 • Automatic end-finding and material-interconnecting arrangements (knot-tying devices B65H 69/00)
- 69/00 Methods of, or devices for, interconnecting successive lengths of material; Knot-tying devices**
- 69/02 • by means of adhesives
- 69/04 • by knotting
- 69/06 • by splicing
- 69/08 • by welding
- 71/00 Moistening, sizing, oiling, waxing, colouring, or drying filamentary material as additional measures during package formation** (applying liquids or other fluent materials to surfaces in general B05)
- 73/00 Stripping waste material from cores or formers, e.g. to permit their re-use**
- Methods, apparatus or devices of general interest or not otherwise provided for in connection with the handling of webs, tapes or filamentary materials**
- 75/00 Storing webs, tapes, or filamentary material, e.g. on reels** (fishing reels A01K 89/00; storing means for record carriers, specially adapted for co-operation with the recording or reproducing apparatus G11B 23/02)
- 75/02 • Cores, formers, supports, or holders for coiled, wound, or folded material, e.g. reels, spindles, bobbins, cop tubes, cans (packaging aspects B65D 85/67)
- 75/04 • • Kinds or types (B65H 75/18 takes precedence)
- 75/06 • • • Flat cores, e.g. cards
- 75/08 • • • of circular or polygonal cross-section (cans or receptacles B65H 75/16)
- 75/10 • • • • without flanges, e.g. cop tubes
- 75/12 • • • • with a single end flange; formed with one end of greater diameter than the barrel
- 75/14 • • • • with two end flanges
- 75/16 • • • Cans or receptacles, e.g. sliver cans
- 75/18 • • Constructional details
- 75/20 • • • Skeleton construction, e.g. formed of wire
- 75/22 • • • collapsible; with removable parts
- 75/24 • • • adjustable in configuration, e.g. expandable
- 75/26 • • • Arrangements for preventing slipping of winding
- 75/28 • • • Arrangements for securing ends of material [3]
- 75/30 • • • Arrangements to facilitate driving or braking
- 75/32 • • • Arrangements to facilitate severing of material
- 75/34 • • specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material provided for particular purposes, e.g. anchored hoses, power cables (retractors for storing flexible hoses as accessories of dental work stands A61G 15/18; vehicle safety belt retractors B60R 22/34; hose-storing devices in apparatus or devices for transferring liquids from bulk storage containers or reservoirs into vehicles or portable containers B67D 7/40; clothes-line supports D06F 53/00; spring drums for liftable blinds with horizontal lamellae E06B 9/322; spring drums or tape drums for roll-type closures or roller blinds E06B 9/56; hauling- or hoisting-chains with arrangements for holding electric cables, hoses or the like F16G 13/16; devices for guiding pipes, cables or protective tubing, between relatively movable points, e.g. movable channels, F16L 3/01; flexible rulers or tapes with scales G01B 3/10; electrical features of stored material, see the relevant subclasses, e.g. H02G) [2, 5]
- 75/36 • • • without essentially involving the use of a core or former internal to a stored package of material, e.g. with stored material housed within casing or container, or intermittently engaging a plurality of supports as in sinuous or serpentine fashion [2]
- 75/38 • • • involving the use of a core or former internal to, and supporting, a stored package of material [2]
- 75/40 • • • • mobile or transportable
- 75/42 • • • • attached to, or forming part of, mobile tools or machines
- 75/44 • • • • Constructional details
- 75/48 • • • • Automatic re-storing devices [2]
- 75/50 • Methods of making reels, bobbins, cop tubes, or the like by working an unspecified material, or several materials
- 77/00 Adjusting or controlling tension in material**
- 79/00 Driving gear for devices for forwarding, winding, unwinding, or depositing material, not otherwise provided for**

<b>81/00</b>	<b>Methods, apparatus, or devices for covering or wrapping cores by winding webs, tapes, or filamentary material, not otherwise provided for</b> (forming hollow objects by winding filamentary material on to fusible or soluble cores B65H 54/64; wrapping for the purpose of packaging B65B 11/00; making wound articles of paper B31C)	<b>83/00</b>	<b>Combinations of piling and depiling operations, e.g. performed simultaneously, of interest apart from the single operation of piling or depiling</b> (B65H 85/00 takes precedence) [5]
81/02	• Covering or wrapping annular or like cores forming a closed or substantially-closed figure	83/02	• performed on the same pile [5]
81/04	• • by feeding material obliquely to the axis of the core	<b>85/00</b>	<b>Recirculating articles, i.e. feeding each article to, and delivering it from, the same machine work-station more than once</b> [5]
81/06	• Covering or wrapping elongated cores	<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>
81/08	• • by feeding material obliquely to the axis of the core		

## B66 HOISTING; LIFTING; HAULING

**B66B ELEVATORS; ESCALATORS OR MOVING WALKWAYS** (funicular railbound systems with rigid ground-supported tracks and cable traction, e.g. cliff railways, B61B 9/00; arrangements of ammunition handlers in vessels B63G 3/00; hoists, lifts, or conveyers for loading or unloading in general B65G; braking or detent devices controlling normal movements of winding drums or barrels B66D; ship-lifting devices E02C; garages for many vehicles with mechanical means for lifting vehicles E04H 6/12; hoists for feeding ammunition or projectiles to launching apparatus or to loading mechanisms F41A 9/00) [4]

### Note(s)

In this subclass, the following term is used with the meaning indicated:

- "elevator" covers the term "lift", and the two terms are interchangeable.

### Subclass index

#### COMMON FEATURES OF ELEVATORS

Control; signalling; checking, safety; other.....1/00, 3/00, 5/00, 7/00

#### LIFTS FOR BUILDINGS

Kinds; component parts; gates.....9/00, 11/00, 13/00

#### LIFTS FOR MINES

Kinds, hoistway equipment; component parts.....17/00, 19/00, 15/00

OTHER ELEVATORS.....20/00

#### ESCALATORS, MOVING WALKWAYS

Kinds; component parts; accessories.....21/00, 23/00, 31/00

Control; indicating operating conditions; safety devices.....25/00, 27/00, 29/00

### Common features of elevators

<b>1/00</b>	<b>Control systems of elevators in general</b> (safety devices B66B 5/00; controlling door or gate operation B66B 13/00; systems of general application G05)	1/20	• • • • and for varying the manner of operation to suit particular traffic conditions, e.g. "one-way rush-hour traffic"
1/02	• Control systems without regulation, i.e. without retroactive action	1/22	• • • • with means for taking account of delayed calls
1/04	• • hydraulic	1/24	• Control systems with regulation, i.e. with retroactive action, for influencing travelling speed, acceleration, or deceleration
1/06	• • electric	1/26	• • mechanical
1/08	• • • with devices, e.g. handles or levers, in the cars or cages for direct control of movements	1/28	• • electrical (detecting excessive speed B66B 5/04)
1/10	• • • • specially adapted for mining hoists	1/30	• • • effective on driving gear
1/12	• • • with devices, e.g. handles or levers, located at a control station for direct control of movements, e.g. electric mining-hoist control systems	1/32	• • • effective on braking devices
1/14	• • • with devices, e.g. push-buttons, for indirect control of movements	1/34	• Details
1/16	• • • • with means for storing pulses controlling the movements of a single car or cage	1/36	• • Means for stopping the cars, cages, or skips at predetermined levels
1/18	• • • • with means for storing pulses controlling the movements of several cars or cages	1/38	• • • and for returning the controlling handle or lever to its neutral position
		1/40	• • • and for correct levelling at landings
		1/42	• • • • separate from the main drive

- 1/44 • • • and for taking account of disturbance factors, e.g. variation of load weight
- 1/46 • • Adaptations of switches or switchgear (switches or switchgear in general, applications of switches or switchgear for floor-levelling purpose H01H; panels for boards or switching arrangements H02B 1/015)
- 1/48 • • • Adaptations of mechanically-operated limit switches (for cranes B66C 13/50; for winding mechanisms B66D 1/56)
- 1/50 • • • with operating or control mechanisms mounted in the car or cage or in the lift well or hoistway
- 1/52 • • • Floor selectors
- 3/00 Applications of devices for indicating or signalling operating conditions of elevators**
- 3/02 • Position or depth indicators
- 5/00 Applications of checking, fault-correcting or safety devices in elevators**
- 5/02 • responsive to abnormal operating conditions
- 5/04 • • for detecting excessive speed
- 5/06 • • • electrical
- 5/08 • • for preventing overwinding
- 5/10 • • • electrical
- 5/12 • • in case of rope or cable slack
- 5/14 • • in case of excessive loads
- 5/16 • • Braking or catch devices operating between cars, cages, or skips and fixed guide elements or surfaces in hoistway or well
- 5/18 • • • and applying frictional retarding forces
- 5/20 • • • • by means of rotatable eccentrically- mounted members (B66B 5/24 takes precedence)
- 5/22 • • • • by means of linearly-movable wedges (B66B 5/24 takes precedence)
- 5/24 • • • • by acting on guide ropes or cables
- 5/26 • • • Positively-acting devices, e.g. latches, knives
- 5/28 • Buffer-stops for cars, cages, or skips
- 7/00 Other common features of elevators**
- 7/02 • Guideways; Guides (arrangements in mine shafts E21D 7/02)
- 7/04 • • Shoes; Rollers
- 7/06 • Arrangements of ropes or cables
- 7/08 • • for connection to the cars or cages, e.g. couplings
- 7/10 • • for equalising rope or cable tension
- 7/12 • Checking, lubricating, or cleaning means for ropes, cables, or guides

#### **Lifts in, or associated with, buildings**

- 9/00 Kinds or types of lift in, or associated with, buildings or other structures** (characterised by control systems B66B 1/00; apparatus for raising or lowering persons on stages of theatres A63J 5/12)
- 9/02 • actuated mechanically otherwise than by rope or cable
- 9/04 • actuated pneumatically or hydraulically (platforms for lifting or lowering through short distances B66F 7/00)
- 9/06 • inclined, e.g. serving blast furnaces
- 9/08 • • associated with stairways, e.g. for transporting disabled persons
- 9/10 • paternoster type (with devices for transferring goods into, or out of, the compartments B65G 17/00)

- 9/16 • Mobile or transportable lifts specially adapted to be shifted from one part of a building or other structure to another part or to another building or structure (devices for lifting or lowering bulky or heavy goods for loading or unloading purposes B66F 9/00, e.g. fork-lift trucks B66F 9/06)
- 9/187 • • with liftway specially adapted for temporary connection to a building or other structure (B66B 9/193 takes precedence) [6]
- 9/193 • • with inclined liftways [6]
- 11/00 Main component parts of lifts in, or associated with, buildings or other structures**
- 11/02 • Cages (doors, gates, or other apparatus controlling access to, or exit from, cages B66B 13/00)
- 11/04 • Driving gear
- 11/06 • • with hoisting rope or cable positively attached to a winding drum
- 11/08 • • with hoisting rope or cable operated by frictional engagement with a winding drum or sheave

#### **13/00 Doors, gates, or other apparatus controlling access to, or exit from, cages or lift-well landings** (door fittings, locks E05)

- 13/02 • Door or gate operation (of general application E05F)
- 13/04 • • of swinging doors
- 13/06 • • of sliding doors
- 13/08 • • • guided for horizontal movement
- 13/10 • • • by car or cage movement
- 13/12 • • Arrangements for effecting simultaneous opening or closing of cage and landing doors
- 13/14 • • Control systems or devices
- 13/16 • • • Door or gate locking devices controlled or primarily controlled by condition of cage, e.g. movement or position
- 13/18 • • • • without manually-operable devices for completing locking or unlocking of doors
- 13/20 • • • • Lock mechanisms actuated mechanically by abutments or projections on the cages
- 13/22 • Operation of door or gate contacts
- 13/24 • Safety devices in passenger lifts, not otherwise provided for, for preventing trapping of passengers
- 13/26 • • between closing doors
- 13/28 • • between car or cage and wells
- 13/30 • Constructional features of doors or gates (of interest apart from this application E06B)

#### **Lifts in hoistways of mines**

##### **15/00 Main component parts of mining-hoist winding devices**

- 15/02 • Rope or cable carriers
- 15/04 • • Friction sheaves; "Koepe" pulleys
- 15/06 • • Drums
- 15/08 • Driving gear

##### **17/00 Hoistway equipment**

- 17/02 • mounted in head-frames (winding towers for mines E04H 12/26)
- 17/04 • Mining-hoist cars or cages
- 17/06 • • with tiltable platforms
- 17/08 • Mining skips
- 17/10 • • adapted for passenger transport
- 17/12 • Counterpoises
- 17/14 • Applications of loading and unloading equipment (of general application B65G)

B66B

- 17/16
  - for loading and unloading mining-hoist cars or cages
- 17/18
  - • • Swinging bridges, e.g. for compensating for differences in level between car or cage and landing
- 17/20
  - • • by moving vehicles into, or out of, the cars or cages
- 17/22
  - • • Securing vehicles in cars or cages
- 17/24
  - • • • mounted on the car or cage
- 17/26
  - • for loading or unloading mining-hoist skips
- 17/28
  - • electrically controlled (for elevators in general B66B 1/06)
- 17/30
  - • • for cars or cages
- 17/32
  - • • for skips
- 17/34
  - Safe lift clips; Keps
- 17/36
  - Gates or other apparatus controlling access to, or exit from, cars, cages, or hoistway landings
- 19/00 Mining-hoist operation**
- 19/02
  - Installing or exchanging ropes or cables
- 19/04
  - Installing or removing mining-hoist cars, cages, or skips
- 19/06
  - Applications of signalling devices (depth indicators B66B 3/02; order telegraphs G08B)

**20/00 Elevators not provided for in groups B66B 1/00-B66B 19/00 [2006.01]**

**Escalators or moving walkways [4]**

- 21/00 Kinds or types of escalators or moving walkways [4]**
- 21/02
  - Escalators [4]
- 21/04
  - • linear type [4]
- 21/06
  - • spiral type [4]
- 21/08
  - • paternoster type, i.e. the escalator being used simultaneously for climbing and descending (B66B 21/06 takes precedence) [4]
- 21/10
  - Moving walkways [4]

**B66C CRANES; LOAD-ENGAGING ELEMENTS OR DEVICES FOR CRANES, CAPSTANS, WINCHES, OR TACKLES** (rope, cable, or chain winding mechanisms, braking or detent devices therefor B66D; specially adapted for nuclear reactors G21)

**Subclass index**

KINDS OF CRANES

- Trolley cranes..... 19/00
- Bridge; cable-way; jib..... 17/00, 21/00, 23/00
- Other cranes..... 25/00

COMMON FEATURES OR DETAILS

- Load-engaging devices..... 1/00, 3/00
- Supporting structures; runways..... 5/00, 6/00, 7/00
- Travelling gear; trolleys..... 9/00, 11/00
- Safety gear..... 15/00
- Other..... 13/00

- 21/12
  - • of variable speed type [4]
- 23/00 Component parts of escalators or moving walkways [4]**
- 23/02
  - Driving gear [4]
- 23/04
  - • for handrails [4]
- 23/06
  - • • with means synchronising the operation of the steps or the carrying belts and the handrails [4]
- 23/08
  - Carrying surfaces [4]
- 23/10
  - • Carrying belts [4]
- 23/12
  - • Steps [4]
- 23/14
  - Guiding means for carrying surfaces [4]
- 23/16
  - Means allowing tensioning of the endless member [4]
- 23/18
  - • for carrying surfaces [4]
- 23/20
  - • for handrails [4]
- 23/22
  - Balustrades [4]
- 23/24
  - • Handrails (driving gear therefor B66B 23/02; tensioning means therefor B66B 23/16; preventing jamming thereof by foreign objects B66B 29/04; accessories therefor B66B 31/02) [4]
- 23/26
  - • • of variable speed type [4]
- 25/00 Control of escalators or moving walkways** (walkways of variable speed type B66B 21/12; handrails of variable speed type B66B 23/26; of general application G05) [4]
- 27/00 Indicating operating conditions of escalators or moving walkways** (of general application G08) [4]
- 29/00 Safety devices of escalators or moving walkways** (walkways of variable speed type B66B 21/12; handrails of variable speed type B66B 23/26) [4]
- 29/02
  - responsive to, or preventing, jamming by foreign objects [4]
- 29/04
  - • for balustrades or handrails [4]
- 29/06
  - • Combplates [4]
- 29/08
  - Means to facilitate passenger entry or exit (moving handrails B66B 23/24) [4]
- 31/00 Accessories for escalators, or moving walkways, e.g. for sterilising or cleaning** (for safety B66B 29/00) [4]
- 31/02
  - for handrails [4]

# **Load-engaging elements or devices attached to lifting, lowering, or hauling gear of cranes or adapted for connection therewith**

## **Note(s)**

In groups B66C 1/00 or B66C 3/00, the following term is used with the meaning indicated:

- "cranes" also covers capstans, winches, or tackles.

- 1/00 Load-engaging elements or devices attached to lifting, lowering, or hauling gear of cranes, or adapted for connection therewith for transmitting forces to articles or groups of articles** (fastening to cables or ropes F16G 11/00)
- 1/02 • by suction means
  - 1/04 • by magnetic means
  - 1/06 • • electromagnetic
  - 1/08 • • • Circuits therefor (for electromagnets in general H01F 7/18)
  - 1/10 • by mechanical means
  - 1/12 • • Slings comprising chains, wires, ropes, or bands; Nets (article side grippers suspended by ropes or chains from crane hooks B66C 1/42)
  - 1/14 • • • Slings with hooks
  - 1/16 • • • Slings with load-engaging platforms or frameworks
  - 1/18 • • • Band-type slings
  - 1/20 • • • specially adapted for handling vehicles
  - 1/22 • • Rigid members, e.g. L-shaped members, with parts engaging the under surface of the loads; Crane hooks
  - 1/24 • • • Single members engaging the loads from one side only
  - 1/26 • • • • with means for releasing the loads
  - 1/28 • • • Duplicate, e.g. pivoted, members engaging the loads from two sides
  - 1/30 • • • • and also arranged to grip the sides of the loads
  - 1/32 • • • • • of piled or stacked articles
  - 1/34 • • • Crane hooks
  - 1/36 • • • • with means, e.g. spring-biased detents, for preventing inadvertent disengagement of loads
  - 1/38 • • • • adapted for automatic disengagement from loads on release of cable tensions (for parachutes B64D)
  - 1/40 • • • • formed or fitted with load-measuring or indicating devices
  - 1/42 • • Gripping members engaging only the external or internal surface of the articles (for handling or stripping castings or ingots during manufacture B22D 29/00)
  - 1/44 • • • and applying frictional forces
  - 1/46 • • • • by inflatable elements
  - 1/48 • • • • to vertical edge portions of sheets, tubes, or like thin or thin-walled articles (internally-expanding grippers B66C 1/54)
  - 1/54 • • • • Internally-expanding grippers for handling hollow articles (B66C 1/46 takes precedence) [2]
  - 1/56 • • • • • for handling tubes
  - 1/58 • • • and deforming the articles, e.g. by using gripping members such as tongs or grapples
  - 1/59 • • • • Tongs for sacks [3]
  - 1/62 • • comprising article-engaging members of a shape complementary to that of the articles to be handled
  - 1/64 • • • for T- or I-section beams or girders

- 1/66 • • • for engaging holes, recesses, or abutments on articles specially provided for facilitating handling thereof
- 1/68 • mounted on, or guided by, jibs (jibs B66C 23/64)
- 3/00 Load-engaging elements or devices attached to lifting or lowering gear of cranes or adapted for connection therewith and intended primarily for transmitting lifting forces to loose materials; Grabs** (buckets or other containers B65D, e.g. pallets B65D 19/00; dredges equipped with grabs E02F)
- 3/02 • Bucket grabs
- 3/04 • Tine grabs
- 3/06 • Grabs actuated by a single rope or chain
- 3/08 • • and having tipping rings
- 3/10 • • and having buckets opening automatically upon the grab being lowered on to the dump of material
- 3/12 • Grabs actuated by two or more ropes
- 3/14 • Grabs opened or closed by driving motors thereon
- 3/16 • • by fluid motors
- 3/18 • • by electric motors
- 3/20 • mounted on, or guided by, jibs (jibs B66C 23/64)

## **Other common features: Details**

- 5/00 Base-supporting structures with legs**
- 5/02 • Fixed or travelling bridges or gantries, i.e. elongated structures of inverted-L- or of inverted-U-shape
  - 5/04 • • with runways or tracks supported for movements relative to bridge or gantry
  - 5/06 • • with runways or tracks supported for lateral swinging movements
  - 5/08 • • with vertically-inclinable runways or tracks
  - 5/10 • Portals, i.e. essentially circular or square platforms with three or more legs specially adapted for supporting slewing jib cranes
  - 6/00 Girders, or track-supporting structures, specially adapted for cranes** (base-supporting structures with legs B66C 5/00; girders in general E04C 3/02)
  - 7/00 Runways, tracks, or trackways for trolleys or cranes**
  - 7/02 • for underhung trolleys or cranes
  - 7/04 • • Trackway suspension
  - 7/06 • • • on supports constructed for easy erection, e.g. transportable
  - 7/08 • Constructional features of runway rails or rail mountings (of general application E01B)
  - 7/10 • Arrangements or devices for extending runways or tracks
  - 7/12 • Devices for changing direction of travel or for transferring from one runway to another; Crossings; Combinations of tracks of different gauges (transfer devices of general application E01B)
  - 7/14 • • Runway interlocking devices
  - 7/16 • Devices specially adapted for limiting trolley or crane travel; Arrangements of buffer-stops (buffer-stops of interest apart from this application B61K 7/18; limit-switch arrangements, limit circuits B66D 1/56)
  - 9/00 Travelling gear incorporated in, or fitted to, trolleys or cranes** (for dredgers E02F)
  - 9/02 • for underhung trolleys or cranes
  - 9/04 • to facilitate negotiation of curves
  - 9/06 • for more than one rail gauge
  - 9/08 • Runners; Runner bearings (wheels for railbound vehicles B60B)

- 9/10 • Undercarriages or bogies, e.g. end carriages, end bogies
- 9/12 • • with load-distributing means for equalising wheel pressure
- 9/14 • Trolley or crane travel drives (rope, cable, or chain drives for loads or trolleys B66C 11/16; control B66C 13/18)
- 9/16 • with means for maintaining alignment between wheels and track
- 9/18 • with means for locking trolleys or cranes to runways or tracks to prevent inadvertent movements
- 11/00 Trolleys or crabs, e.g. operating above runways**  
(runways, tracks, or trackways therefor B66C 7/00; winch mechanisms B66D)
- 11/02 • with operating gear or operator's cabin suspended, or laterally offset, from runway or track
- 11/04 • • Underhung trolleys (power-operated hoists with driving motor and drum or barrel contained in a common housing B66D 3/20)
- 11/06 • • • running on monorails (overhead railway systems B61B)
- 11/08 • with turntables
- 11/10 • • equipped with jibs (jib cranes B66C 23/00)
- 11/12 • having hoisting gear adapted to special load-engaging elements and not otherwise provided for
- 11/14 • adapted to operate on crane or bridge structure of particular configuration, e.g. on reinforced concrete girders of rectangular cross-section
- 11/16 • Rope, cable, or chain drives for trolleys; Combinations of such drives with hoisting gear
- 11/18 • • comprising endless ropes or cables
- 11/20 • • Arrangements, e.g. comprising differential gears, enabling simultaneous or selective operation of travelling and hoisting gear; Arrangements using the same rope or cable for both travelling and hoisting, e.g. in Temperley cranes (power transmissions between driving motors and winch drums B66D 1/14)
- 11/22 • • actuated pneumatically or hydraulically
- 11/24 • • with means for locating or sustaining the loads or trolleys in predetermined positions; Hay hoists
- 11/26 • • • Abutments; Stop blocks; End stops
- 13/00 Other constructional features or details**
- 13/02 • Devices for facilitating retrieval of floating objects, e.g. for recovering craft from water (equipment for handling lifeboats or the like B63B 23/00; loading or unloading floating cargo using ship-based equipment B63B 27/36; salvaging, or hauling-out on slipways, waterborne vessels B63C; winding mechanism controls B66D 1/52)
- 13/04 • Auxiliary devices for controlling movements of suspended loads, or for preventing cable slack
- 13/06 • • for minimising or preventing longitudinal or transverse swinging of loads
- 13/08 • • for depositing loads in desired attitudes or positions
- 13/10 • • for preventing cable slack (control devices for rope, cable, or chain winding mechanisms, e.g. for controlling tension, B66D 1/40)
- 13/12 • Arrangements of means for transmitting pneumatic, hydraulic, or electric power to movable parts or devices (devices of general interest specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34)
- 13/14 • • to load-engaging elements or motors associated therewith
- 13/16 • Applications of indicating, registering, or weighing devices (in crane hooks B66C 1/40; in safety gear B66C 15/00; weighing-apparatus G01G; remote indicating in general G08)
- 13/18 • Control systems or devices (exclusively for rope, cable, or chain winding mechanisms B66D 1/40)
- 13/20 • • for non-electric drives (transmitting control pulses B66C 13/40)
- 13/22 • • for electric drives (transmitting control pulses B66C 13/40; systems or devices of general application H02P)
- 13/23 • • • Circuits for controlling the lowering of the load
- 13/24 • • • • by dc motors
- 13/26 • • • • by ac motors
- 13/28 • • • • utilising regenerative braking for controlling descent of heavy loads and having means for preventing rotation of motor in the hoisting direction when load is released
- 13/30 • • • Circuits for braking, traversing, or slewing motors
- 13/32 • • • for operating grab-bucket hoists by means of one or more electric motors used both for hoisting and lowering the loads and for opening and closing the bucket jaws (other aspects of rope, cable, or chain winding mechanisms specially adapted for actuating grab buckets B66D 1/62)
- 13/34 • • • • through differential or planetary gearing
- 13/36 • • • • Single-motor-drive control systems
- 13/38 • • • • Systems controlling independent motors
- 13/40 • • Applications of devices for transmitting control pulses; Applications of remote control devices (control in general G05)
- 13/42 • • • Hydraulic transmitters
- 13/44 • • • Electrical transmitters
- 13/46 • • Position indicators for suspended loads or for crane elements
- 13/48 • • Automatic control of crane drives for producing a single or repeated working cycle; Programme control
- 13/50 • • Applications of limit circuits or of limit-switch arrangements (for winding mechanisms B66D 1/56)
- 13/52 • Details of compartments for driving engines or motors or of operator's stands or cabins
- 13/54 • • Operator's stands or cabins
- 13/56 • • • Arrangements of handles or pedals
- 15/00 Safety gear** (for rope, cable, or chain winding mechanisms B66D 1/54)
- 15/02 • for retaining load-engaging elements in the event of rope or cable breakage
- 15/04 • for preventing collisions, e.g. between cranes or trolleys operating on the same track
- 15/06 • Arrangements or use of warning devices [2]

#### Kinds or types of cranes [2]

- 17/00 Overhead travelling cranes comprising one or more substantially-horizontal girders the ends of which are directly supported by wheels or rollers running on tracks carried by spaced supports** (adaptations of girders or of track-supporting structures B66C 6/00)

17/04	<ul style="list-style-type: none"> <li>with lifting beams, e.g. slewable beams, carrying load-engaging elements, e.g. magnets, hooks (constructions of load-engaging elements B66C 1/00, B66C 3/00)</li> </ul>		
17/06	<ul style="list-style-type: none"> <li>specially adapted for particular purposes, e.g. in foundries, forges; combined with auxiliary apparatus serving particular purposes (B66C 17/04 takes precedence)</li> </ul>	23/02	<ul style="list-style-type: none"> <li>with non-adjustable and non-inclinable jibs mounted solely for slewing movements</li> </ul>
17/08	<ul style="list-style-type: none"> <li>for charging treatment chambers, e.g. furnaces, kilns, ovens (charging furnaces in general F27D 3/00)</li> </ul>	23/04	<ul style="list-style-type: none"> <li>with jibs the effective length of which is variable in operation, e.g. longitudinally displaceable, extensible</li> </ul>
17/10	<ul style="list-style-type: none"> <li>for transporting ladles</li> </ul>	23/06	<ul style="list-style-type: none"> <li>with jibs mounted for jibbing or luffing movements</li> </ul>
17/12	<ul style="list-style-type: none"> <li>for handling workpieces, e.g. ingots, which require to be supported temporarily within, or withdrawn from, a treatment chamber, e.g. tong cranes, soaking-pit cranes, stripper cranes (for manipulating ingots during forging B66C 17/18; grippers for handling or stripping castings or ingots during manufacture B22D 29/00)</li> </ul>	23/08	<ul style="list-style-type: none"> <li>and adapted to move the loads in predetermined paths</li> </ul>
17/14	<ul style="list-style-type: none"> <li>Tong cranes with means for moving article-pushers relative to the tongs</li> </ul>	23/10	<ul style="list-style-type: none"> <li>the paths being substantially horizontal; Level-luffing jib cranes</li> </ul>
17/16	<ul style="list-style-type: none"> <li>Tong cranes with means for turning the tongs about a vertical axis</li> </ul>	23/12	<ul style="list-style-type: none"> <li>with means for automatically varying the effective length of the hoisting rope or cable</li> </ul>
17/18	<ul style="list-style-type: none"> <li>for manipulating workpieces during forging operations (workpiece manipulators in forging machines B21J 13/10)</li> </ul>	23/14	<ul style="list-style-type: none"> <li>with means, e.g. pantograph arrangements, for varying jib configuration</li> </ul>
17/20	<ul style="list-style-type: none"> <li>for hoisting or lowering heavy load carriers, e.g. freight containers, railway wagons</li> </ul>	23/16	<ul style="list-style-type: none"> <li>with jibs supported by columns, e.g. towers having their lower end mounted for slewing movements</li> </ul>
17/22	<ul style="list-style-type: none"> <li>for hoisting or lowering locomotives</li> </ul>	23/18	<ul style="list-style-type: none"> <li>specially adapted for use in particular locations or for particular purposes (B66C 23/02-B66C 23/16, B66C 23/58-B66C 23/88 take precedence) [5]</li> </ul>
17/24	<ul style="list-style-type: none"> <li>for building ships on slipways</li> </ul>	23/20	<ul style="list-style-type: none"> <li>with supporting couples provided by walls of buildings or like structures</li> </ul>
17/26	<ul style="list-style-type: none"> <li>combined with auxiliary apparatus, e.g. log saws, pushers for unloading vehicles, means for shunting railway vehicles</li> </ul>	23/22	<ul style="list-style-type: none"> <li>Window cranes, i.e. adapted to be supported in window openings</li> </ul>
19/00	<b>Cranes comprising trolleys or crabs running on fixed or movable bridges or gantries</b> (B66C 17/00 takes precedence; base-supporting structures with legs B66C 5/00; adaptations of girders or of track-supporting structures B66C 6/00; jib cranes B66C 23/00)	23/24	<ul style="list-style-type: none"> <li>Mobile wall cranes</li> </ul>
19/02	<ul style="list-style-type: none"> <li>collapsible</li> </ul>	23/26	<ul style="list-style-type: none"> <li>for use on building sites; constructed, e.g. with separable parts, to facilitate rapid assembly or dismantling, for operation at successively higher levels, for transport by road or rail (with supporting couples provided by walls or buildings B66C 23/20; mounted on vehicles B66C 23/36) [5]</li> </ul>
21/00	<b>Cable cranes, i.e. comprising hoisting devices running on aerial cable-ways</b> (adaptations of girders or of track-supporting structures B66C 6/00; rope or cable drives for trolleys, combinations of such drives with hoisting gear B66C 11/16; railway systems B61B; rope or cable winding mechanisms B66D 1/00)	23/28	<ul style="list-style-type: none"> <li>constructed to operate at successively higher levels</li> </ul>
21/02	<ul style="list-style-type: none"> <li>with cable-ways supported on framework swingably connected to ground-engaging elements</li> </ul>	23/30	<ul style="list-style-type: none"> <li>with frameworks composed of telescopic elements</li> </ul>
21/04	<ul style="list-style-type: none"> <li>with cable-ways supported at one end or both ends on bodily-movable framework, e.g. framework mounted on rail track</li> </ul>	23/32	<ul style="list-style-type: none"> <li>Self-hoisting cranes</li> </ul>
21/06	<ul style="list-style-type: none"> <li>with one end supported on a framework movable in a curved, e.g. circular, path and the other end by a column rotatable around a vertical axis</li> </ul>	23/34	<ul style="list-style-type: none"> <li>Self-erecting cranes, i.e. with hoisting gear adapted for crane erection purposes</li> </ul>
21/08	<ul style="list-style-type: none"> <li>Sag carriers or rope trolleys, suspended or not, e.g. fixed but offering clearance for travelling gear</li> </ul>	23/36	<ul style="list-style-type: none"> <li>mounted on road or rail vehicles; Manually-movable jib cranes for use in workshops; Floating cranes (vehicle or ship aspects B60-B63)</li> </ul>
21/10	<ul style="list-style-type: none"> <li>travelling</li> </ul>	23/38	<ul style="list-style-type: none"> <li>with separate prime movers for crane and vehicle</li> </ul>
23/00	<b>Cranes comprising essentially a beam, boom or triangular structure acting as a cantilever and mounted for translatory or swinging movements in vertical or horizontal planes or a combination of such movements, e.g. jib cranes, derricks or tower cranes</b> (base-supporting structures with legs B66C 5/00; adaptations of girders or of track-supporting structures B66C 6/00)	23/40	<ul style="list-style-type: none"> <li>with a single prime mover for both crane and vehicle</li> </ul>
		23/42	<ul style="list-style-type: none"> <li>with jibs of adjustable configuration, e.g. foldable</li> </ul>
		23/44	<ul style="list-style-type: none"> <li>Jib cranes adapted for attachment to standard vehicles, e.g. agricultural tractors</li> </ul>
		23/46	<ul style="list-style-type: none"> <li>Mobile jib cranes with non-slewable jibs</li> </ul>
		23/48	<ul style="list-style-type: none"> <li>Manually-movable jib cranes for use in workshops</li> </ul>
		23/50	<ul style="list-style-type: none"> <li>mounted on railway vehicles, e.g. breakdown cranes</li> </ul>
		23/52	<ul style="list-style-type: none"> <li>Floating cranes (floating dredgers E02F)</li> </ul>
		23/53	<ul style="list-style-type: none"> <li>including counterweight or means to compensate for list, trim, or skew of the vessel or platform (counterweights or supports for balancing lifting couples B66C 23/72; equipment to decrease unwanted vessel movements B63B 39/00) [4]</li> </ul>
		23/58	<ul style="list-style-type: none"> <li>arranged to carry-out a desired sequence of operations automatically, e.g. hoisting followed by luffing and slewing</li> </ul>

## B66C

- 23/60 • Derricks [3]
- 23/61 • • with slewing force exerted at pivoted end [3]
- 23/62 • Constructional features or details (of dredgers E02F)
- 23/64 • • Jibs
- 23/66 • • • Outer or upper end constructions
- 23/68 • • • foldable or otherwise adjustable in configuration (B66C 23/687, B66C 23/70 take precedence) [5]
- 23/683 • • • • while in use [5]
- 23/687 • • • telescopic [5]
- 23/69 • • • • while in use [5]
- 23/693 • • • • • extensible by fluid pressure [5]
- 23/697 • • • • providing bearing means between sections [5]
- 23/70 • • • assembled from separate sections to form jibs of various discrete lengths
- 23/72 • • Counterweights or supports for balancing lifting couples
- 23/74 • • • separate from jib

- 23/76 • • • • and movable to take account of variations of load or of variations of length of jib
- 23/78 • • • Supports, e.g. outriggers, for mobile cranes
- 23/80 • • • • hydraulically actuated
- 23/82 • • Luffing gear
- 23/84 • • Slewing gear (anti-friction bearings F16C)
- 23/86 • • • hydraulically actuated
- 23/88 • Safety gear (for cranes in general B66C 15/00; for rope, cable, or chain winding mechanisms B66D 1/54)
- 23/90 • • Devices for indicating or limiting lifting movement
- 23/92 • • Snubbers or dash-pots for preventing backwards-swinging of jibs, e.g. in the event of cable or tackle breakage
- 23/94 • • for limiting slewing movements

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**25/00 Cranes not provided for in groups B66C 17/00-B66C 23/00 [2006.01]**

**B66D CAPSTANS; WINCHES; TACKLES, e.g. PULLEY BLOCKS; HOISTS** (winding or unwinding ropes or cables for feeding or storage purposes B65H; rope or cable-winding or unwinding mechanisms for lifts B66B; hoisting devices specially adapted for suspended scaffolds E04G 3/32)

### Note(s)

This subclass covers:

- rope, cable, or chain winding or unwinding mechanisms for moving all loads except lift cages, e.g. winches for dredges;
- braking or detent devices characterised by their application for retarding, or preventing, rotary movement of a winding drum or barrel.

**1/00 Rope, cable, or chain winding mechanisms; Capstans** (portable or mobile lifting or hauling appliances B66D 3/00)

- 1/02 • Driving gear
- 1/04 • • manually operated
- 1/06 • • • Safety cranks for preventing unwanted crank rotation and subsequent lowering of the loads
- 1/08 • • incorporating fluid motors
- 1/10 • • • Steam driving gear
- 1/12 • • incorporating electric motors
- 1/14 • • Power transmissions between power sources and drums or barrels
- 1/16 • • • the drums or barrels being freely rotatable (B66D 1/24 takes precedence)
- 1/18 • • • • and the power being transmitted from a continuously-operating and irreversible prime mover
- 1/20 • • • Chain, belt, or friction drives, e.g. incorporating sheaves
- 1/22 • • • Planetary or differential gearings (for actuating grab buckets B66D 1/70)
- 1/24 • • • for varying speed, or reversing direction of rotation, of drums or barrels
- 1/26 • having several drums or barrels
- 1/28 • Other constructional details
- 1/30 • • Rope, cable, or chain drums or barrels
- 1/34 • • • Attachment of ropes or cables to drums or barrels
- 1/36 • • Guiding, or otherwise ensuring winding in an orderly manner, of ropes, cables, or chains
- 1/38 • • • by means of guides movable relative to drum or barrel (B66D 1/395 takes precedence) [3]

- 1/39 • • • by means of axially-movable drums or barrels (B66D 1/395 takes precedence) [3]
- 1/395 • • • by means effecting both guiding and tensioning of ropes, cables or chains [3]
- 1/40 • • Control devices
- 1/42 • • • non-automatic
- 1/44 • • • • pneumatic or hydraulic
- 1/46 • • • • electric
- 1/48 • • • automatic
- 1/50 • • • • for maintaining predetermined rope, cable, or chain tension, e.g. in ropes or cables for towing craft, in chains for anchors; Warping or mooring winch-cable tension control
- 1/52 • • • • for varying rope or cable tension, e.g. when recovering craft from water
- 1/54 • Safety gear
- 1/56 • • Adaptations of limit switches
- 1/58 • • responsive to excess of load
- 1/60 • adapted for special purposes
- 1/62 • • for actuating grab buckets (electrical control in cranes B66C 13/32)
- 1/64 • • • by means of a single rope or chain
- 1/66 • • • driven by a single motor
- 1/68 • • • driven by two motors
- 1/70 • • • driven through planetary or differential gearings
- 1/72 • • Anchor-chain sprockets; Anchor capstans
- 1/74 • • Capstans
- 1/76 • • • having auxiliary drums or barrels for storing the ropes or cables
- 1/78 • • • for shunting, e.g. in marshalling yards



- 1/80 • • for scrapers
- 1/82 • • for slewing and hoisting by means of derricks

### 3/00 Portable or mobile lifting or hauling appliances

- 3/02 • Manually-operated, e.g. lever-actuated, devices operating on ropes, cables, or chains for hauling in a mainly horizontal direction (B66D 3/04, B66D 3/12 take precedence)
- 3/04 • Pulley blocks or like devices in which force is applied to a rope, cable or chain, which passes over one or more pulleys, e.g. to obtain mechanical advantage (sheaves, chain wheels, pulleys F16H 55/00) [4]
- 3/06 • • with more than one pulley
- 3/08 • • • Arrangements of sheaves
- 3/10 • • • Applications of braking or detent devices
- 3/12 • Chain or like hand-operated tackles with or without power-transmission gearing between operating member and lifting rope, chain, or cable
- 3/14 • • lever-operated
- 3/16 • • operated by an endless chain passing over a pulley or a sprocket
- 3/18 • Power-operated hoists
- 3/20 • • with driving motor, e.g. electric motor, and drum or barrel contained in a common housing
- 3/22 • • • with variable-speed gearing between driving motor and drum or barrel
- 3/24 • • Applications of limit switches

- 3/26 • • Other details, e.g. housings

### 5/00 Braking or detent devices characterised by their application to lifting or hoisting gear, e.g. for controlling the lowering of loads (for pulley blocks B66D 3/10)

- 5/02 • Crane, lift, hoist, or winch brakes operating on drums, barrels, or ropes
- 5/04 • • actuated by centrifugal force
- 5/06 • • with radial effect (B66D 5/20 takes precedence)
- 5/08 • • • embodying blocks or shoes
- 5/10 • • • embodying bands
- 5/12 • • with axial effect (B66D 5/22 takes precedence)
- 5/14 • • • embodying discs
- 5/16 • • for action on ropes or cables
- 5/18 • • for generating braking forces which are proportional to the loads suspended; Load-actuated brakes
- 5/20 • • • with radial effect
- 5/22 • • • with axial effect
- 5/24 • • Operating devices
- 5/26 • • • pneumatic or hydraulic
- 5/28 • • • specially adapted for winding gear, e.g. in mining hoists
- 5/30 • • • electrical
- 5/32 • Detent devices
- 5/34 • • having latches

**B66F HOISTING, LIFTING, HAULING, OR PUSHING, NOT OTHERWISE PROVIDED FOR, e.g. DEVICES WHICH APPLY A LIFTING OR PUSHING FORCE DIRECTLY TO THE SURFACE OF A LOAD** (mounting artificial islands on piles or like supports E02B 17/00; scaffolds combined with lifting devices E04G 1/22, E04G 3/28; lifting devices for sliding forms E04G 11/24; lifting of buildings E04G 23/06; shores or struts E04G 25/00; lifts or other hoisting devices on ladders E06C 7/12; props for mining E21D 15/00)

#### Subclass index

JACKS OR THE LIKE.....	1/00, 3/00, 5/00
LIFTING FRAMES.....	7/00
DEVICES FOR PARTICULAR USES.....	5/00, 9/00, 11/00
MASTED LIFTING-PLATFORM OR FORK-LIFT TRUCKS.....	9/06
COMMON FEATURES OR ACCESSORIES.....	13/00
CROWBARS OR LEVERS.....	15/00
SAFETY DEVICES.....	17/00
OTHER HOISTING, LIFTING, HAULING, OR PUSHING.....	19/00

### 1/00 Devices, e.g. jacks, for lifting loads in predetermined steps

- 1/02 • with locking elements, e.g. washers, co-operating with posts
- 1/04 • • the posts being toothed
- 1/06 • • • and the devices being actuated mechanically
- 1/08 • • • and the devices being operated by fluid pressure

### 3/00 Devices, e.g. jacks, adapted for uninterrupted lifting of loads (mobile jacks of the garage type B66F 5/00)

- 3/02 • with racks actuated by pinions
- 3/04 • • with several racks
- 3/06 • • with racks comprising pivotable toothed sections or segments, e.g. arranged in pairs
- 3/08 • screw-operated (B66F 3/44 takes precedence; gearings F16H)
- 3/10 • • with telescopic sleeves

- 3/12 • • comprising toggle levers (lazy-tongs mechanisms B66F 3/22)
- 3/14 • • actuated through pawl-and-ratchet mechanisms
- 3/16 • • actuated through bevel-wheel gearings
- 3/18 • • actuated through worm gearings
- 3/20 • • actuated through multiple or change-speed gearings
- 3/22 • Lazy-tongs mechanisms
- 3/24 • fluid-pressure operated (water-pressure machines F03B; fluid-pressure servomotors F15B, e.g. pyrotechnical actuators F15B 15/19; hydraulic gearings F16H; cylinders, pistons F16J)
- 3/25 • • Constructional features [3]
- 3/26 • • • Adaptations or arrangements of pistons [3]
- 3/28 • • • • telescopic [3]
- 3/30 • • • Positive brakes or locks [3]
- 3/32 • • • Means for avoiding excessive shocks on completion movements [3]

## B66F

- 3/35
  - Inlatable flexible elements, e.g. bellows (inlatable load-engaging elements B66F 3/40; connection of valves to inflatable elastic bodies B60C 29/00) [3]
- 3/36
  - Load-engaging elements [3]
- 3/38
  - adjustable relative to piston [3]
- 3/40
  - inflatable (connection of valves to inflatable elastic bodies B60C 29/00) [3]
- 3/42
  - with self-contained pumps, e.g. actuated by hand [3]
- 3/43
  - Pyrotechnical jacks [3]
- 3/44
  - with self-contained electric driving motors
- 3/46
  - Combinations of several jacks with means for interrelating lifting or lowering movements

### 5/00 Mobile jacks of the garage type mounted on wheels or rollers

- 5/02
  - with mechanical lifting gear
- 5/04
  - with fluid-pressure-operated lifting gear

### 7/00 Lifting frames, e.g. for lifting vehicles; Platform lifts (for lift-truck platforms B66F 9/06)

- 7/02
  - with platforms suspended from ropes, cables, or chains
- 7/04
  - hydraulically or pneumatically operated
- 7/06
  - with platforms supported by levers for vertical movement
- 7/08
  - hydraulically or pneumatically operated
- 7/10
  - with platforms supported directly by jacks
- 7/12
  - by mechanical jacks
- 7/14
  - screw-operated
- 7/16
  - by one or more hydraulic or pneumatic jacks
- 7/18
  - by a single central jack
- 7/20
  - by several jacks with means for maintaining the platforms horizontal during movement
- 7/22
  - with tiltable platforms (tilting vehicles for unloading B65G 67/34)
- 7/24
  - for raising or lowering vehicles by their own power
- 7/26
  - for selective lifting of parts of vehicles (mobile garage jacks B66F 5/00)
- 7/28
  - Constructional details, e.g. end stops, pivoting supporting members, sliding runners adjustable to load dimensions

### 9/00 Devices for lifting or lowering bulky or heavy goods for loading or unloading purposes (mobile or transportable lifts in, or associated with, buildings and specially adapted to be shifted from one part of a building or other structure to another part or to another building or structure B66B 9/16; cranes B66C)

- 9/02
  - Stationary loaders or unloaders, e.g. for sacks
- 9/04
  - hydraulically actuated or controlled

- 9/06
  - movable, with their loads, on wheels or the like, e.g. fork-lift trucks (vehicle aspects B60-B62; vehicles predominantly for transporting loads and modified to facilitate loading or unloading B60P 1/00; low-lift hand trucks for transporting goods B62B 3/06)
- 9/065
  - non-masted (mobile jacks of the garage type mounted on wheels or rollers B66F 5/00) [3]
- 9/07
  - Floor-to-roof stacking devices, e.g. stacker cranes, retrievers [3]
- 9/075
  - Constructional features or details [3]
- 9/08
  - Masts; Guides; Chains [3]
- 9/10
  - movable in a horizontal direction relative to truck [3]
- 9/12
  - Platforms; Forks; Other load-supporting or load-gripping members [3]
- 9/14
  - laterally movable, e.g. swingable, for slewing or transverse movements [3]
- 9/16
  - inclinable relative to mast [3]
- 9/18
  - Load gripping or retaining means [3]
- 9/19
  - Additional means for facilitating unloading [3]
- 9/20
  - Means for actuating or controlling masts, platforms, or forks (power take-off from vehicle transmissions, combined with vehicle propulsion systems B60K) [3]
- 9/22
  - Hydraulic devices or systems [3]
- 9/24
  - Electrical devices or systems [3]

### 11/00 Lifting devices specially adapted for particular uses not otherwise provided for (ground-engaging vehicle fittings for supporting, lifting or manoeuvring the vehicle B60S 9/00)

- 11/04
  - for movable platforms or cabins, e.g. on vehicles, permitting workmen to place themselves in any desired position for carrying out required operations (platforms for cleaning windows A47L 3/02; devices for rescuing persons from buildings A62B 1/02; vehicle aspects of service vehicles B60P 3/14; maintenance travellers for bridges E01D 19/10; scaffolds on an extensible substructure E04G 1/22; liftable or lowerable platforms for use on ladders E06C 7/16)

### 13/00 Common constructional features or accessories

### 15/00 Crowbars or levers

### 17/00 Safety devices, e.g. for limiting or indicating lifting force

### 19/00 Hoisting, lifting, hauling, or pushing, not otherwise provided for

- 19/02
  - Hauling using anchors; Anchors therefor (marine anchors B63B 21/24; anchoring aircraft B64F 1/12; means for anchoring structural elements specially adapted to foundation engineering E02D 5/74) [3]

## B67 OPENING OR CLOSING BOTTLES, JARS OR SIMILAR CONTAINERS; LIQUID HANDLING

### B67B APPLYING CLOSURE MEMBERS TO BOTTLES, JARS, OR SIMILAR CONTAINERS; OPENING CLOSED CONTAINERS (opening or closing devices attached to, or incorporated in, containers or container closures B65D)

#### 1/00 Closing bottles, jars, or similar containers by applying stoppers (stoppers per se B65D 39/00)

- 1/03
  - Pretreatment of stoppers, e.g. cleaning, steaming, heating, impregnating or coating; Applying resilient

- rings to stoppers (mechanical working of cork B27J 5/00) [5]
- 1/04 • by inserting threadless stoppers, e.g. corks
  - 1/06 • by inserting and rotating screw stoppers
  - 1/08 • Securing stoppers, e.g. swing stoppers, which are held in position by associated pressure-applying means coacting with the bottle neck
  - 1/10 • by inserting disc closures [6]
- 3/00 Closing bottles, jars, or similar containers by applying caps** (caps *per se* B65D 41/00)
- 3/02 • by applying flanged caps, e.g. crown caps, and securing by deformation of flanges
  - 3/04 • • Cutting caps from strip material in capping machines (devices for registering moving strip material B65H 23/00)
  - 3/06 • • Feeding caps to capping heads
  - 3/062 • • • from a magazine
  - 3/064 • • • from a hopper
  - 3/10 • • Capping heads for securing caps
  - 3/12 • • • characterised by being movable axially relative to cap to deform flanges thereof, e.g. to press projecting flange rims inwardly
  - 3/14 • • • characterised by having movable elements, e.g. hinged fingers, for applying radial pressure to the flange of the cap (B67B 3/16, B67B 3/18 take precedence) [5]
  - 3/16 • • • characterised by having resilient deforming elements, e.g. resilient sleeves or collars (B67B 3/18 takes precedence) [5]
  - 3/18 • • • characterised by being rotatable, e.g. for forming screw threads *in situ* [5]
  - 3/20 • by applying and rotating preformed threaded caps (forming threads *in situ* by resilient deforming means B67B 3/16, by rotary capping heads B67B 3/18) [5]
  - 3/22 • by applying snap-on caps
  - 3/24 • Special measures for applying and securing caps under vacuum
  - 3/26 • Applications of control, warning, or safety devices in capping machinery
  - 3/28 • Mechanisms for causing relative movement between bottle or jar and capping head [5]
- 5/00 Applying protective or decorative covers to closures; Devices for securing bottle closures with wire** (infant-feeding teats with means for fastening to bottles A61J 11/04) [6]
- 5/03 • Applying protective or decorative covers to closures, e.g. by forming *in situ* [3]
  - 5/05 • • by applying liquids, e.g. by dipping [3]
  - 5/06 • Devices for securing bottle closures with wire (B67B 1/08 takes precedence)
- 6/00 Closing bottles, jars or similar containers by applying closure members, not provided for in groups B67B 1/00-B67B 5/00 [2009.01]**
- 7/00 Hand- or power-operated devices for opening closed containers** (nail pullers or extractors B25C 11/00; attached to, or incorporated in, containers or container closures B65D)
- 7/02 • for removing stoppers
  - 7/04 • • Cork-screws
  - 7/06 • • Other cork removers
  - 7/08 • • • using air or gas pressure
  - 7/10 • • with means for retrieving stoppers from the interior of the container
  - 7/12 • for removing disc-closures
  - 7/14 • for removing tightly-fitting lids or covers, e.g. of shoe-polish tins, by gripping and rotating
  - 7/15 • • finger grapple type [5]
  - 7/16 • for removing flanged caps, e.g. crown caps
  - 7/18 • for removing threaded caps (B67B 7/14 takes precedence; wrenches B25B 13/00) [2]
  - 7/20 • for breaking vacuum seals between lids or covers and bodies of preserving jars, e.g. by wedge action
  - 7/22 • • incorporating loops, e.g. of wire, which are tightened around seal
  - 7/40 • Devices for engaging tags, strips, or tongues for opening by tearing, e.g. slotted keys for opening sardine tins
  - 7/42 • Devices for removing barrel bungs
  - 7/44 • Combination tools, e.g. comprising cork-screws, can piercers, crown-cap removers (combinations of opening devices with cutting tools B26, with devices serving other purposes, *see* the appropriate places, e.g. B25F, B43K 29/00)
  - 7/46 • Cutting devices, i.e. devices including at least one cutting element having one or more cutting edges for piercing through the wall of a closed container, e.g. can openers (B67B 7/44 takes precedence; machines for domestic use with a plurality of interchangeable units A47J 43/06, A47J 44/00; hand-held cutting tools, cutting, severing, in general B26) [4]
  - 7/48 • • punch type, i.e. the cutting element including at least one sharp cutting edge adapted to pierce through the container wall in, ordinarily, a single operating stroke [4]
  - 7/50 • • • with fulcrum, i.e. a lever-like actuating handle with provision to establish a pivot point [4]
  - 7/52 • • • Plural spaced cutting edges adapted to pierce the container during a single operating stroke [4]
  - 7/54 • • sweep cutter type, i.e. an opening device including means to establish a pivot point between the cutting element and the container and having means to move the cutting element about the pivot point [4]
  - 7/56 • • • with container penetrating pivot and variable cutter radius, i.e. the distance between the cutting element and the penetrating pivot being changeable [4]
  - 7/58 • • • • Freely slidable cutter [4]
  - 7/60 • • having force multiplying means employed to relatively turn the container and cutting element about a fixed point to force the cutting element to traverse the container [4]
- Note(s)**
- In this group, a simple lever or handle to be manipulated by the operator to relatively rotate the container and opener is not considered to be a force multiplying means.
- 7/62 • • Progressive fulcrum, i.e. having a lever-like actuating handle and provision to establish a pivot point which is progressively translated relative to the container during the opening operation [4]
- Note(s)**
- In this group, the pivot point may be established by (a) contact between the container and a portion of the handle engaging the container, or (b) contact between the handle and a reaction member engaging the container.
- 7/64 • • • with guide means to engage container wall and guide the cutting element thereabout [4]

## B67B

- 7/66 • • • cutter pivoted to reaction member [4]
- 7/68 • • shear type, i.e. including cutting elements co-operating with one another so that their respective cutting edges move pass and in substantial contact with each other to perform the cutting operation [4]
- 7/70 • • including an annular, driven, wheel-like roller member adapted to continuously engage a container chime during the opening operation [4]
- 7/72 • • • Cutter comprising rotatable disc [4]
- 7/74 • • • Roller drive means causes initial piercing, i.e. force applied to rotate the wheel-like member causes the cutting element to pierce the container wall [4]
- 7/76 • • • adapted to pierce container side wall [4]
- 7/78 • • including plural cutters [4]
- 7/80 • • with means to cover an opening in the container made by the cutting element [4]
- 7/82 • • with means to prevent the cut portion from dropping into the container or to raise the cut portion out of the container [4]
- 7/84 • • adapted for right or left-hand operation, i.e. the device is capable of being operated in either direction about the container [4]

### Note(s)

This group covers also a progressive fulcrum type container opener including a fulcrum extending from each side of the cutting blade.

- 7/86 • • with spout or means to deform or bend the material of the container to form a spout [4]
- 7/88 • • with means to clean or sanitise the cutting element [4]
- 7/90 • • with sensor, activator and controller [4]

### Note(s)

In this group, the sensor, e.g. trip lever, push button, photo-cell system, or the like, detects a condition, such as the condition of the container, the container contents, the can opener itself or the environment of the opener which may affect the operation of the opener. The activator, e.g. circuit breaker, clutch, valve, or the like, causes a release of energy. The controller, e.g. motor, driver, or the like, changes or causes the operation of the opener.

- 7/92 • by breaking, e.g. for ampoules [5]

## B67C FILLING WITH LIQUIDS OR SEMILIQUIDS, OR EMPTYING, OF BOTTLES, JARS, CANS, CASKS, BARRELS, OR SIMILAR CONTAINERS, NOT OTHERWISE PROVIDED FOR; FUNNELS

### Subclass index

#### BOTTLES

Filling; emptying..... 3/00, 9/00

Combined operations..... 7/00

#### JARS, CANS, CASKS

Filling; emptying..... 3/00, 9/00

FUNNELS..... 11/00

**3/00 Bottling liquids or semiliquids; Filling jars or cans with liquids or semiliquids using bottling or like apparatus; Filling casks or barrels with liquids or semiliquids** (filling containers with liquids or semiliquids using apparatus other than bottling or like apparatus B65B 3/00)

- 3/02 • Bottling liquids or semiliquids; Filling jars or cans with liquids or semiliquids using bottling or like apparatus
- 3/04 • • without applying pressure
- 3/06 • • using counterpressure, i.e. filling while the container is under pressure
- 3/08 • • • and subsequently lowering the counterpressure
- 3/10 • • • preliminary filling with inert gases, e.g. carbon dioxide
- 3/12 • • • Pressure-control devices
- 3/14 • • • specially adapted for filling with hot liquids
- 3/16 • • using suction
- 3/18 • • using siphoning arrangements
- 3/20 • • with provision for metering the liquids to be introduced, e.g. when adding syrups (measuring volume, or volume flow, in general G01F)
- 3/22 • • Details
- 3/24 • • • Devices for supporting or handling bottles (transport or storing devices in general B65G)

- 3/26 • • • Filling-heads; Means for engaging filling-heads with bottle necks
- 3/28 • • • Flow-control devices, e.g. using valves (valves in general F16K)
- 3/30 • Filling of barrels or casks
- 3/32 • • using counterpressure, i.e. filling while the container is under pressure
- 3/34 • • Devices for engaging filling-heads with filling-apertures

**7/00 Concurrent cleaning, filling, and closing of bottles; Processes or devices for at least two of these operations**

**9/00 Emptying bottles, jars, cans, casks, barrels, or similar containers, not otherwise provided for** (devices for tilting and emptying containers B65G 65/23) [3]

**11/00 Funnels, e.g. for liquids** (filter funnels B01D 29/085; volume-flow meters G01F)

- 11/02 • without discharge valves
- 11/04 • with non-automatic discharge valves
- 11/06 • with automatic discharge valves

**B67D DISPENSING, DELIVERING, OR TRANSFERRING LIQUIDS, NOT OTHERWISE PROVIDED FOR** (cleaning pipes or tubes or systems of pipes or tubes B08B 9/02; emptying or filling of bottles, jars, cans, casks, barrels, or similar containers, not otherwise provided for B67C; water supply E03; pipe systems F17D; domestic hot-water supply systems F24D; measuring volume, volume flow, mass flow or liquid level, metering by volume G01F; coin-freed or like apparatus G07F) [5]

- 1/00 Apparatus or devices for dispensing beverages on draught** (B67D 3/00 takes precedence; apparatus for making beverages A47J 31/00) [3]
- 1/02 • Beer engines or like manually-operable pumping apparatus
- 1/04 • Apparatus utilising compressed air or other gas acting directly or indirectly on beverages in storage containers
- 1/06 • Mountings or arrangements of dispensing apparatus in or on shop or bar counters (shop or bar counters *per se* A47F 9/00)
- 1/07 • Cleaning beverage-dispensing apparatus [5]
- 1/08 • Details
- 1/10 • • Pump mechanisms (in general F04)
- 1/12 • • Flow- or pressure-control devices or systems
- 1/14 • • • Reducing valves or control taps
- 1/16 • • Devices for collecting spilled beverages
- 3/00 Apparatus or devices for controlling flow of liquids under gravity from storage containers for dispensing purposes** (separating and dispensing metered quantities of liquids G01F)
- 3/02 • Liquid-dispensing valves having operating members arranged to be pressed upwards, e.g. by the rims of receptacles held below the delivery orifice
- 3/04 • Liquid-dispensing taps or cocks adapted to seal and open tapping-holes of casks, e.g. for beer
- 7/00 Apparatus or devices for transferring liquids from bulk storage containers or reservoirs into vehicles or into portable containers, e.g. for retail sale purposes** (general disposition of plant in stations for supplying fuel to vehicles B60S 5/02; for filling or emptying locomotive water tanks, e.g. water columns, B61K 11/00; for refuelling aircraft during flight B64D 39/00; liquid-handling ground installations specially adapted for fuelling stationary aircraft B64F 1/28) [2010.01]
- 7/02 • for transferring liquids other than fuel or lubricants [2010.01]
- 7/04 • for transferring fuels, lubricants or mixed fuels and lubricants [2010.01]
- 7/06 • Details or accessories [2010.01]
- 7/08 • • Arrangements of devices for controlling, indicating, metering or registering quantity or price of liquid transferred (arrangement of flow- or pressure-control valves B67D 7/36; computing, calculating, counting G06; coin-freed apparatus for dispensing fluids G07F 13/00; prepayment devices for metering liquids G07F 15/00) [2010.01]
- 7/10 • • • operated by keys, push-buttons or cash registers [2010.01]
- 7/12 • • • operated by movement of delivery hose or nozzle or by devices associated therewith [2010.01]
- 7/14 • • • responsive to input of recorded programmed information, e.g. on punched cards [2010.01]
- 7/16 • • • Arrangements of liquid meters [2010.01]
- 7/18 • • • • of piston type [2010.01]
- 7/20 • • • • of rotary type [2010.01]
- 7/22 • • • Arrangements of indicators or registers (indicating or recording in fluid meters G01F 15/06) [2010.01]
- 7/24 • • • • with means for producing or issuing a receipt or record of sale [2010.01]
- 7/26 • • • • with resetting or zeroing means [2010.01]
- 7/28 • • • with automatic means for reducing or intermittently interrupting flow before completion of delivery, e.g. to produce dribble feed [2010.01]
- 7/30 • • • with means for predetermining quantity of liquid to be transferred (B67D 7/10, B67D 7/14 take precedence) [2010.01]
- 7/32 • • Arrangements of safety or warning devices; Means for preventing unauthorised delivery of liquid [2010.01]
- 7/34 • • • Means for preventing unauthorised delivery of liquid [2010.01]
- 7/36 • • Arrangements of flow- or pressure-control valves (associated with nozzles B67D 7/42) [2010.01]
- 7/38 • • Arrangements of hoses, e.g. operative connection with pump motor (hoses in general F16L 11/00) [2010.01]
- 7/40 • • • Suspending, reeling or storing devices (supports for storing lengths of hoses, in general B65H 75/34) [2010.01]
- 7/42 • • Filling nozzles [2010.01]
- 7/44 • • • automatically closing [2010.01]
- 7/46 • • • • when liquid in container to be filled reaches a predetermined level [2010.01]
- 7/48 • • • • • by making use of air suction through an opening closed by the rising liquid [2010.01]
- 7/50 • • • • and provided with an additional hand lever [2010.01]
- 7/52 • • • • and provided with additional flow-controlling valve means [2010.01]
- 7/54 • • • with means for preventing escape of liquid or vapour or for recovering escaped liquid or vapour (B67D 7/44 takes precedence) [2010.01]
- 7/56 • • Arrangements of flow-indicators, e.g. transparent compartments, windows, rotary vanes (indicating or recording presence, absence or direction of movement G01P 13/00) [2010.01]
- 7/58 • • Arrangements of pumps [2010.01]
- 7/60 • • • manually operable [2010.01]
- 7/62 • • • power operated [2010.01]
- 7/64 • • • • of piston type [2010.01]
- 7/66 • • • • of rotary type [2010.01]
- 7/68 • • • submerged in storage tank or reservoir [2010.01]
- 7/70 • • • of two or more pumps in series or parallel [2010.01]
- 7/72 • • Devices for applying air or other gas pressure for forcing liquid to delivery point [2010.01]
- 7/74 • • Devices for mixing two or more different liquids to be transferred (coin-freed apparatus G07F 13/06) [2010.01]

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- 7/76 • • Arrangements of devices for purifying liquids to be transferred, e.g. of filters, of air or water separators [2010.01]
- 7/78 • • Arrangements of storage tanks, reservoirs or pipe-lines [2010.01]
- 7/80 • • Arrangements of heating or cooling devices for liquids to be transferred [2010.01]
- 7/82 • • • Heating only [2010.01]
- 7/84 • • Casings, cabinets or frameworks; Trolleys or like movable supports [2010.01]

- 7/86 • • Illuminating arrangements [2010.01]
- 9/00 **Apparatus or devices for transferring liquids when loading or unloading ships** (ship-based equipment B63B 27/00) [2010.01]
- 9/02 • using articulated pipes [2010.01]
- 99/00 **Subject matter not provided for in other groups of this subclass [2010.01]**

## B68 SADDLERY; UPHOLSTERY

### B68B HARNESS; DEVICES USED IN CONNECTION THEREWITH; WHIPS OR THE LIKE

- 1/00 **Devices in connection with harness, for hitching, reining, training, breaking, or quietening horses or other traction animals** (devices of this kind combined with traction harness B68B 3/00; stable equipment A01K 1/00; devices forming part of a vehicle B62C)
- 1/02 • Halters
- 1/04 • Bridles; Reins
- 1/06 • • Bits
- 1/08 • Curbs
- 1/10 • Blinkers
- 1/12 • • movable
- 1/13 • Devices for preventing bolting (for unhitching bolting traction animals B68B 5/08)
- 1/14 • Hobbling devices
- 3/00 **Traction harnesses; Traction harnesses combined with devices referred to in group B68B 1/00**
- 3/02 • Yokes
- 3/04 • Horse collars; Manufacturing same
- 3/06 • • Adjustable collars
- 3/08 • • with protective pads
- 3/10 • • • Pneumatic collars
- 3/12 • • Locks therefor
- 3/14 • Breast collars

- 3/16 • Cruppers
- 3/18 • Breechings
- 3/20 • Traces (manufacture of belts C14B, of ropes D07)
- 3/22 • • Trace holders (devices forming part of a vehicle B62C)
- 5/00 **Details or accessories** (haberdashery A44); **Fastening devices for bridles, reins, harnesses, or the like** (devices forming part of a vehicle B62C)
- 5/02 • Fastening devices for traces (resilient attachments B68B 7/00)
- 5/04 • Tail holders as part of harness
- 5/06 • Devices for fastening special articles on harnesses, bridles, or the like
- 5/08 • Devices for unhitching bolting traction animals
- 7/00 **Horse protectors, e.g. resilient attachments** (protective covers B68C 5/00)
- 9/00 **Devices specially adapted for supporting harnesses when not in use**
- 11/00 **Whips or the like**
- 99/00 **Subject matter not provided for in other groups of this subclass [2006.01]**

### B68C SADDLES; STIRRUPS

- 1/00 **Saddling equipment for riding- or pack-animals**
- 1/02 • Saddles
- 1/04 • • Adjustable saddles
- 1/06 • • Side saddles
- 1/08 • • with pneumatic pads
- 1/10 • • with spring pads
- 1/12 • Bottom pads for saddles; Saddle cloths
- 1/14 • Belts or straps for saddles; Tighteners therefor
- 1/16 • Fastening stirrups to saddles; Stirrup-leathers (stirrups B68C 3/00)

- 1/18 • • with safety arrangements for loosening the connection between stirrup and saddle, e.g. in case of rider's fall
- 1/20 • Pockets, receptacles, or other supporting devices attached or attachable to saddle, e.g. for insertion of arms
- 3/00 **Stirrups**
- 3/02 • with side part or sole plate attached to other parts of the stirrup movably, e.g. pivotally
- 5/00 **Covers for animals when working, e.g. for protection**

### B68F MAKING ARTICLES FROM LEATHER, CANVAS, OR THE LIKE

- 1/00 **Making articles from leather, canvas, or the like** (machines or equipment for saddle-making B68F 3/00;

manufacturing footwear A43D; manufacture or

treatment of leather in general, splitting leather,  
manufacture of driving or other belts C14)

**3/00 Machines or equipment specially adapted for saddle-making** (methods B68F 1/00)

3/02 • Machines

3/04 • Hand tools

## **B68G METHODS, EQUIPMENT, OR MACHINES FOR USE IN UPHOLSTERING; UPHOLSTERY NOT OTHERWISE PROVIDED FOR**

### **Subclass index**

LOOSE FILLING MATERIALS; TREATMENT THEREOF; RESILIENT PADS.....1/00, 3/00, 5/00  
MAKING UPHOLSTERY; FITTING SPRINGS THEREIN.....7/00, 9/00  
FINISHED UPHOLSTERY; UPHOLSTERY PANELS.....11/00, 13/00  
AUXILIARY DEVICES OR TOOLS.....15/00

**1/00 Loose filling materials for upholstery** (manufacture of the materials, see the relevant classes)

**3/00 Treating materials to adapt them specially as upholstery filling**

3/02 • Cleaning; Conditioning

3/04 • Teasing; Untwisting ropes or cords of filling materials

3/06 • Curling; Twisting filling materials into ropes or cords

3/08 • Preparation of bed feathers from natural feathers

3/10 • • Cleaning or conditioning of bed feathers (B68G 3/02 takes precedence)

3/12 • • Sorting of bed feathers

**5/00 Resilient upholstery pads** (finished upholstery B68G 11/00; waddings, fleeces, mats, or like products of fibrous structure, see the relevant classes)

5/02 • of cellular material, e.g. sponge rubber (shaping of plastics or substances in a plastic state for the production of porous or cellular articles B29C)

**7/00 Making upholstery** (manufacturing upholstered panels B68G 13/00; sewing-machines D05B)

7/02 • Making upholstery from waddings, fleeces, mats, or the like (filling methods B68G 7/06)

7/04 • • by conveyer-line methods

7/05 • Covering or enveloping cores of pads

7/052 • • with webs secured to the core, e.g. by stitching

7/054 • • Arrangements of sheathings between spring cores and overlying paddings

7/06 • Filling of cushions, mattresses, or the like

7/08 • Quilting (tools B68G 15/00); Elements therefor

7/10 • Finishing of edges

7/12 • Other elements specially adapted for fastening, fixing, or finishing, in upholstery work

**9/00 Placing upholstery springs in pockets; Fitting springs in upholstery**

**11/00 Finished upholstery not provided for in other classes**

11/02 • mainly composed of fibrous materials

11/03 • • with stitched or bonded fibre webs

11/04 • mainly composed of resilient materials, e.g. of foam rubber

11/06 • • with embedded springs, e.g. bonded

**13/00 Upholstered panels** (specially adapted for sound-absorption E04B, G10K)

13/02 • with indented pattern formed by stitching

13/04 • with indented pattern formed by bonding

**15/00 Auxiliary devices or tools specially for upholstery**

**99/00 Subject matter not provided for in other groups of this subclass [2009.01]**

## MICRO-STRUCTURAL TECHNOLOGY; NANO-TECHNOLOGY

### B81 MICRO-STRUCTURAL TECHNOLOGY

#### Note(s)

1. This class covers micro-structural devices or systems, including at least one essential element or formation characterised by its very small size, typically within the range of 10<sup>-4</sup> to 10<sup>-7</sup> meters, i.e. its significant features can not, in at least one dimension, be completely discerned without the use of an optical microscope.
2. In this class, the following expressions are used with the meaning indicated:
  - "micro-structural devices" covers:
    - i. micro-mechanical devices comprising movable, flexible or deformable elements; and
    - ii. three-dimensional structures without movable, flexible or deformable elements, comprising microformations designed to accomplish an essential structural function for interacting with their environment, as opposed to purely electronic or chemical functions, regardless of whether the structures are combined with micro-electronic devices or formed from specific materials;
  - "micro-structural systems" covers:
    - i. systems of cooperating micro-structural devices; and
    - ii. micro-electro-mechanical or micro-opto-mechanical systems, which combine on a common substrate the specific features of micro-structural devices and electrical or optical components, e.g. for controlling, analysing or signalling the functioning of micro-structural devices.

**B81B MICRO-STRUCTURAL DEVICES OR SYSTEMS, e.g. MICRO-MECHANICAL DEVICES** (piezo-electric, electrostrictive or magnetostrictive elements per se H01L 41/00) [7]

#### Note(s)

1. This subclass does not cover:
  - purely electrical or electronic devices per se which are covered by section H, e.g. subclass H01L;
  - purely optical devices per se which are covered by subclasses G02B or G02F;
  - essentially two-dimensional structures, e.g. layered products which are covered by subclass B32B;
  - chemical or biological structures per se which are covered by section C;
  - structures in atomic scale produced by manipulation of single atoms or molecules, which are covered by group B82B 1/00.
2. Devices or systems classified in this subclass are also classified in appropriate subclasses providing for their structural or functional features, if such features are of interest.

**1/00 Devices without movable or flexible elements, e.g. micro-capillary devices [7]**

**3/00 Devices comprising flexible or deformable elements, e.g. comprising elastic tongues or membranes** (B81B 5/00 takes precedence) [7]

**5/00 Devices comprising elements which are movable in relation to each other, e.g. comprising slidable or rotatable elements [7]**

**7/00 Micro-structural systems [7]**

- 7/02 • containing distinct electrical or optical devices of particular relevance for their function, e.g. micro-electro-mechanical systems (MEMS) (B81B 7/04 takes precedence) [7]
- 7/04 • Networks or arrays of similar micro-structural devices [7]

**B81C PROCESSES OR APPARATUS SPECIALLY ADAPTED FOR THE MANUFACTURE OR TREATMENT OF MICRO-STRUCTURAL DEVICES OR SYSTEMS** (making microcapsules or microballoons B01J 13/02; processes or apparatus specially adapted for the manufacture or treatment of piezo-electric, electrostrictive or magnetostrictive elements per se H01L 41/22) [7]

#### Note(s)

This subclass does not cover:

- processes or apparatus for the manufacture or treatment of purely electrical or electronic devices, which are covered by section H, e.g. group H01L 21/00;
- processes or apparatus involving the manipulation of single atoms or molecules, which are covered by group B82B 3/00.

**1/00 Manufacture or treatment of devices or systems in or on a substrate** (B81C 3/00 takes precedence) [7]

**3/00 Assembling of devices or systems from individually processed components [7]**



99/00 Subject matter not provided for in other groups of

this subclass [2010.01]

**B82 NANO-TECHNOLOGY****Note(s) [2011.01]**

In this class, the following terms are used with the meaning indicated:

- "nano-size" or "nano-scale" relate to a controlled geometrical size below 100 nanometres (nm) in one or more dimensions;
- "nano-structure" means an entity having at least one nano-sized functional component that makes physical, chemical or biological properties or effects available, which are uniquely attributable to the nano-scale.

**B82B NANO-STRUCTURES FORMED BY MANIPULATION OF INDIVIDUAL ATOMS, MOLECULES, OR LIMITED COLLECTIONS OF ATOMS OR MOLECULES AS DISCRETE UNITS; MANUFACTURE OR TREATMENT THEREOF [7]**

**Note(s)**

1. This subclass does not cover chemical or biological nano-structures per se, provided for elsewhere, e.g., in classes C08 or C12.
2. Attention is drawn to the Note following the title of class B82, which defines the meaning of the terms "nano-size", "nano-scale" and "nano-structure" in this subclass.
3. Subject matter classified in this subclass is further classified in subclass B82Y, in order to enable a comprehensive search of nano-structure technology using classification symbols of B82Y in combination with classification symbols of B82B.
4. Nano-structures having specialised features or functions are further classified in appropriate places in other subclasses that provide for those features or functions, e.g. in G01Q, G02F 1/017, H01L 29/775.

**1/00 Nano-structures formed by manipulation of individual atoms or molecules, or limited collections of atoms or molecules as discrete units [7]**

**3/00 Manufacture or treatment of nano-structures by manipulation of individual atoms or molecules, or limited collections of atoms or molecules as discrete units [7]**

**B82Y SPECIFIC USES OR APPLICATIONS OF NANO-STRUCTURES; MEASUREMENT OR ANALYSIS OF NANO-STRUCTURES; MANUFACTURE OR TREATMENT OF NANO-STRUCTURES [2011.01]**

**Note(s) [2011.01]**

1. This subclass covers applications and aspects of nano-structures which are produced by any method, and is not restricted to those that are formed by manipulation of individual atoms or molecules.
2. Attention is drawn to the Note following the title of class B82, which defines the meaning of the terms "nano-size", "nano-scale" and "nano-structure" in this subclass.
3. This subclass is intended to enable a comprehensive search of subject matter related to nano-structures by combination of classification symbols of this subclass with classification symbols from other subclasses. Therefore this subclass covers aspects of nano-structures that might also be entirely or partially covered elsewhere in the IPC.
4. This subclass is for secondary classification, i.e. obligatory supplementary classification of subject matter already classified as such in other classification places, e.g.:
  - B82B.....Nano-structures formed by individual manipulation of atoms, molecules, or limited collections of atoms or molecules as discrete units; manufacture or treatment thereof
  - A61K 9/51.....Nano-capsules for medicinal preparations
  - B05D 1/20.....Langmuir-Blodgett films
  - C01B 31/02.....Carbon nano-structures, e.g. bucky-balls, nanotubes, nanocoils, nano-doughnuts or nano-onions
  - G01Q.....Scanning probe techniques
  - G02F 1/017.....Optical quantum wells or boxes
  - H01F 10/32.....Nano-structured thin magnetic films
  - H01F 41/30.....Molecular beam epitaxy [MBE]
  - H01L 29/775.....Quantum wire FETs
5. The classification symbols of this subclass are not listed first when assigned to patent documents.
6. In this subclass, multi-aspects classification is applied, so that aspects of subject matter that are covered by more than one of its groups should be classified in each of those groups.

**5/00 Nano-biotechnology or nano-medicine, e.g. protein engineering or drug delivery [2011.01]**

**15/00 Nano-technology for interacting, sensing or actuating, e.g. quantum dots as markers in protein assays or molecular motors [2011.01]**

**10/00 Nano-technology for information processing, storage or transmission, e.g. quantum computing or single electron logic [2011.01]**

**20/00 Nano-optics, e.g. quantum optics or photonic crystals [2011.01]**

**B82Y**

**25/00** *Nano-magnetism, e.g. magnetoimpedance, anisotropic magnetoresistance, giant magnetoresistance or tunneling magnetoresistance [2011.01]*

**30/00** *Nano-technology for materials or surface science, e.g. nano-composites [2011.01]*

**35/00** *Methods or apparatus for measurement or analysis of nano-structures [2011.01]*

**40/00** *Manufacture or treatment of nano-structures [2011.01]*

**99/00** *Subject matter not provided for in other groups of this subclass [2011.01]*

**B99 SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION**

**B99Z** SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [2006.01]

**Note(s) [2006.01]**

This subclass covers subject matter that:

- a. is not provided for, but is most closely related to, the subject matter covered by the subclasses of this section, and
- b. is not explicitly covered by any subclass of another section.

**99/00** **Subject matter not otherwise provided for in this section [2006.01]**