# International Patent Classification

2014.01

## Section B

## PERFORMING OPERATIONS; TRANSPORTING

World Intellectual Property Organization

# SECTION B — PERFORMING OPERATIONS; TRANSPORTING

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**Subsection MICRO-STRUCTURAL TECHNOLOGY; NANO-TECHNOLOGY**

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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
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.....B07B

Wet methods
General operations.....B03B
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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

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# B01 PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

## B01B BOILING; BOILING APPARATUS

**1/00** **Boiling; Boiling apparatus for physical or chemical purposes** (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)**

1. 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).
2. 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.
3. For apparatus used in drying or evaporation, class F26 takes precedence over this subclass.
4. 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
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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
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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

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**1/00** **Evaporating** (drying solid materials or objects by evaporating liquids therefrom F26B)
1/02 • Evaporators with heating coils
1/04 • Evaporators with horizontal tubes
1/06 • Evaporators with vertical tubes
1/08 • • with short tubes (B01D 1/12 takes precedence)
1/10 • • with long tubes, e.g. Kestner evaporators (B01D 1/12 takes precedence)
1/12 • • and forced circulation
1/14 • with heated gases or vapours in contact with the liquid
1/16 • by spraying (B01D 1/22 takes precedence)
1/18 • • to obtain dry solids (B01D 1/24 takes precedence)
1/20 • • Sprayers
1/22 • by bringing a thin layer of the liquid into contact with a heated surface
1/24 • • to obtain dry solids
1/26 • Multiple-effect evaporating
1/28 • with vapour compression
1/30 • Accessories for evaporators

**3/00** **Distillation or related exchange processes in which liquids are contacted with gaseous media, e.g. stripping [2]**
3/02 • in boilers or stills **[2]**
3/04 • pipe stills
3/06 • Flash distillation **[2]**
3/08 • in rotating vessels; Atomisation on rotating discs (B01D 3/10 takes precedence)
3/10 • Vacuum distillation (B01D 3/12 takes precedence) **[2]**
3/12 • Molecular distillation **[2]**
3/14 • Fractional distillation
3/16 • • Fractionating columns in which vapour bubbles through liquid
3/18 • • • with horizontal bubble plates
3/20 • • • • Bubble caps; Risers for vapour; Discharge pipes for liquid
3/22 • • • with horizontal sieve plates or grids; Construction of sieve plates or grids
3/24 • • • with sloping plates or elements mounted stepwise
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
3/28 • • • Fractionating columns with surface contact and vertical guides, e.g. film action
3/30 • • Fractionating columns with movable parts or in which centrifugal movement is caused
3/32 • • Other features of fractionating columns
3/34 • with one or more auxiliary substances
3/36 • • Azeotropic distillation
3/38 • • Steam distillation
3/40 • • Extractive distillation
3/42 • Regulation; Control

**5/00** **Condensation of vapours; Recovering volatile solvents by condensation** (B01D 8/00 takes precedence; condensers F28B) **[3]**

**7/00** **Sublimation** (B01D 8/00 takes precedence; freeze-drying F26)
7/02 • Crystallisation directly from the vapour phase (into single crystals C30B 23/00) **[2]**

**8/00** **Cold traps; Cold baffles [3]**

**9/00** **Crystallisation** (crystallisation directly from the vapour phase B01D 7/02; making single crystals C30B)
9/02 • from solutions

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]**

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 tiltable 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]**

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

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**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 conveyors
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 or conveyor belts
46/38 • • • as fluidised bed

46/40 • Particle separators, e.g. dust precipitators, using edge filters, i.e. using contiguous impervious surfaces
46/42 • Auxiliary equipment or operation thereof
46/44 • • controlling filtration
46/46 • • • automatic
46/48 • • Removing dust other than cleaning filters
46/50 • • Means for discharging electrostatic potential
46/52 • Particle separators, e.g. dust precipitators, using filters embodying folded material
46/54 • Particle separators, e.g. dust precipitators, using ultra-fine filter sheets or diaphragms

**47/00 Separating dispersed particles from gases, air or vapours by liquid as separating agent** (B01D 45/10 takes precedence; fractionating columns or parts thereof B01D 3/16)
47/02 • by passing the gas or air or vapour over or through a liquid bath
47/04 • by passing the gas or air or vapour through foam
47/05 • by condensation of the separating agent **[3]**
47/06 • Spray cleaning
47/08 • • with rotary nozzles
47/10 • Venturi scrubbers
47/12 • Washers with plural different washing sections (B01D 47/14 takes precedence) **[3]**
47/14 • Packed scrubbers **[3]**
47/16 • Apparatus having rotary means, other than rotatable nozzles, for atomising the cleaning liquid
47/18 • • with horizontally-arranged shafts

**49/00 Separating dispersed particles from gases, air or vapours by other methods**
49/02 • by thermal repulsion

**50/00 Combinations of devices for separating particles from gases or vapours**

**51/00 Auxiliary pretreatment of gases or vapours to be cleaned from dispersed particles [6]**
51/02 • Amassing the particles, e.g. by flocculation
51/04 • • by seeding, e.g. by adding particles
51/06 • • by varying the pressure of the gas or vapour
51/08 • • • by sound or ultrasonics
51/10 • Conditioning the gas to be cleaned

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**53/00 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** (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]**

**Note(s)**

Group B01D 53/34 takes precedence over groups B01D 53/02-B01D 53/32.

53/02 • by adsorption, e.g. preparative gas chromatography
53/04 • • with stationary adsorbents
53/047 • • • Pressure swing adsorption **[6]**
53/053 • • • • with storage or buffer vessel **[6]**
53/06 • • with moving adsorbents
53/08 • • • according to the "moving bed" method
53/10 • • • with dispersed adsorbents
53/12 • • • • according to the "fluidised technique"
53/14 • by absorption
53/18 • • Absorbing units; Liquid distributors therefor (B01D 3/16, B01D 3/26, B01D 3/30 take precedence)
53/22 • by diffusion
53/24 • by centrifugal force (centrifuges B04B; cyclones B04C)
53/26 • Drying gases or vapours
53/28 • • Selection of materials for use as drying agents
53/30 • Controlling by gas-analysis apparatus
53/32 • by electrical effects other than those provided for in group B01D 61/00 **[5]**
53/34 • Chemical or biological purification of waste gases **[3, 6]**
53/38 • • Removing components of undefined structure **[6]**
53/40 • • • Acidic components (B01D 53/44 takes precedence) **[6]**
53/42 • • • Basic components (B01D 53/44 takes precedence) **[6]**
53/44 • • • Organic components **[6]**
53/46 • • Removing components of defined structure **[6]**
53/48 • • • Sulfur compounds **[6]**
53/50 • • • • Sulfur oxides (B01D 53/60 takes precedence) **[6]**
53/52 • • • • Hydrogen sulfide **[6]**
53/54 • • • Nitrogen compounds **[6]**
53/56 • • • • Nitrogen oxides (B01D 53/60 takes precedence) **[6]**
53/58 • • • • Ammonia **[6]**
53/60 • • • Simultaneously removing sulfur oxides and nitrogen oxides **[6]**
53/62 • • • Carbon oxides **[6]**
53/64 • • • Heavy metals or compounds thereof, e.g. mercury **[6]**
53/66 • • • Ozone **[6]**
53/68 • • • Halogens or halogen compounds **[6]**
53/70 • • • • Organic halogen compounds **[6]**
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]**
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:
   - "properties" covers those of a mechanical, physical or chemical nature.
2. Manufacturing processes, if considered of interest, are also classified in group B01D 67/00.

69/02 • characterised by their properties **[5]**
69/04 • Tubular membranes **[5]**
69/06 • Flat membranes **[5]**
69/08 • Hollow fibre membranes (manufacture of hollow fibres D01D 5/24, D01F 1/08) **[5]**

69/10 • Supported membranes; Membrane supports **[5]**
69/12 • Composite membranes; Ultra-thin membranes **[5]**
69/14 • Dynamic membranes **[5]**

**71/00 Semi-permeable membranes for separation processes or apparatus characterised by the material; Manufacturing processes specially adapted therefor [5]**

**Note(s)**

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.
2. Manufacturing processes, if considered of interest, are also classified in group B01D 67/00.

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71/02 • Inorganic material **[5]**
71/04 • • Glass **[5]**
71/06 • Organic material **[5]**
71/08 • • Polysaccharides **[5]**
71/10 • • • Cellulose; Modified cellulose **[5]**
71/12 • • • Cellulose derivatives **[5]**
71/14 • • • • Esters of organic acids **[5]**
71/16 • • • • • Cellulose acetate **[5]**
71/18 • • • • • Mixed esters, e.g. cellulose acetate-butyrate **[5]**
71/20 • • • • Esters of inorganic acids, e.g. cellulose nitrate **[5]**
71/22 • • • • Cellulose ethers **[5]**
71/24 • • Rubbers **[5]**

**Note(s)**

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).

71/26 • • Polyalkenes **[5]**
71/28 • • Polymers of vinyl aromatic compounds **[5]**
71/30 • • Polyalkenyl halides **[5]**
71/32 • • • containing fluorine atoms **[5]**
71/34 • • • • Polyvinylidene fluoride **[5]**
71/36 • • • • Polytetrafluoroethene **[5]**
71/38 • • Polyalkenylalcohols; Polyalkenylesters; Polyalkenylethers; Polyalkenylaldehydes; Polyalkenylketones; Polyalkenylacetals; Polyalkenylketals **[5]**
71/40 • • Polymers of unsaturated acids or derivatives thereof, e.g. salts, amides, imides, nitriles, anhydrides, esters **[5]**
71/42 • • • Polymers of nitriles, e.g. polyacrylonitrile **[5]**
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]**
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]**
71/66 • • Polymers having sulfur in the main chain, with or without nitrogen, oxygen or carbon only **[5]**
71/68 • • • Polysulfones; Polyethersulfones **[5]**
71/70 • • Polymers having silicon in the main chain, with or without sulfur, nitrogen, oxygen or carbon only **[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]**
71/74 • • Natural macromolecular material or derivatives thereof (B01D 71/08, B01D 71/24 take precedence) **[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]**
71/78 • • • Graft polymers **[5]**
71/80 • • • Block polymers **[5]**
71/82 • • • characterised by the presence of specified groups, e.g. introduced by chemical after-treatment **[5]**

**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
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

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**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

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**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
17/10 • Derivatives of low-molecular-weight sulfocarboxylic acids or sulfopolycarboxylic acids
17/12 • Sulfonates of aromatic or alkylated aromatic compounds
17/14 • Derivatives of phosphoric acid
17/16 • Amines or polyamines

17/18 • Quaternary ammonium compounds
17/20 • Phosphonium and sulfonium compounds
17/22 • Amides or hydrazides
17/24 • • Amides of higher fatty acids with aminoalkylated sulfonic acids
17/26 • Sulfonamides
17/28 • Aminocarboxylic acids (protein hydrolysates B01F 17/30)
17/30 • Proteins; Protein hydrolysates
17/32 • Heterocyclic compounds
17/34 • Higher-molecular-weight carboxylic acid esters (B01F 17/06 takes precedence)
17/36 • • Esters of polycarboxylic acids
17/38 • Alcohols, e.g. oxidation products of paraffins
17/40 • Phenols
17/42 • Ethers, e.g. polyglycol ethers of alcohols or phenols
17/44 • • Ether carboxylic acids
17/46 • • Ethers of aminoalcohols
17/48 • • Cellulose ethers
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)**

1. 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.
2. 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

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**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 conveyor 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]**
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]**
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 Preparing grain for milling or like processes** (hulling, husking, decorticating, polishing, removing the awns, or degerming B02B 3/00)
1/02 • Dry treatment (sifting or sorting in general B07)
1/04 • Wet treatment, e.g. washing, wetting, softening
1/06 • • Devices with rotary parts
1/08 • Conditioning grain with respect to temperature or water content (air conditioning or ventilating of silos F24F; drying apparatus F26B; hygrometers G01N)

**3/00 Hulling; Husking; Decorticating** (decorticating textile fibres D01B 1/14)**; Polishing; Removing the awns** (in threshing machines A01F 12/42)**; Degerming**
3/02 • by means of discs
3/04 • by means of rollers
3/06 • by means of screws or worms
3/08 • by means of beaters or blades
3/10 • by means of brushes
3/12 • by means of fluid
3/14 • Producing flour or meal directly

**5/00 Grain treatment not otherwise provided for**
5/02 • Combined processes

**7/00 Auxiliary devices**
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

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**1/00 Crushing or disintegrating by reciprocating members**
1/02 • Jaw crushers or pulverisers
1/04 • • with single-acting jaws
1/06 • • with double-acting jaws
1/08 • • with jaws coacting with a rotating roller
1/10 • • Shape or construction of jaws
1/12 • Mills with non-rotating spiked members
1/14 • Stamping mills

**2/00 Crushing or disintegrating by gyratory or cone crushers**
2/02 • eccentrically moved
2/04 • • with vertical axis
2/06 • • • and with top bearing
2/08 • • with horizontal axis
2/10 • concentrically moved; Bell crushers

**4/00 Crushing or disintegrating by roller mills** (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)
4/02 • with two or more rollers
4/04 • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
4/06 • • specially adapted for milling grain
4/08 • • with co-operating corrugated or toothed crushing-rollers
4/10 • with a roller co-operating with a stationary member
4/12 • • in the form of a plate
4/14 • • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
4/16 • • • specially adapted for milling grain
4/18 • • in the form of a bar
4/20 • • • wherein the roller is corrugated or toothed
4/22 • • • specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
4/24 • • • specially adapted for milling grain
4/26 • • in the form of a grid or grating
4/28 • Details
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

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**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

**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. riffling **[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 $SO_3$ **[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]**

**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)

**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) **[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
7/04 • • Casings facilitating discharge
7/06 • • Safety devices
7/08 • Rotary bowls
7/10 • • Bowls for shaping solids
7/12 • • Inserts, e.g. armouring plates
7/14 • • • for separating walls of conical shape
7/16 • • • Sieves or filters
7/18 • • formed or coated with sieving or filtering elements

**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

**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 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
5/04 • • Tangential inlets
5/06 • • Axial inlets
5/08 • Vortex chamber constructions
5/081 • • Shapes or dimensions
5/085 • • with wear-resisting arrangements
5/087 • • with flexible gas-tight walls
5/10 • • with perforated walls
5/103 • • Bodies or members, e.g. bulkheads, guides, in the vortex chamber (cores B04C 5/107)
5/107 • • Cores; Devices for inducing an air-core in hydrocyclones (forming part of the outlet pipe B04C 5/13)
5/12 • Construction of the overflow ducting, e.g. diffusing or spiral exits
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
5/14 • Construction of the underflow ducting; Apex constructions; Discharge arrangements

5/15 • • with swinging flaps or revolving sluices; Sluices; Check-valves
5/16 • • with variable-size outlets from the underflow ducting
5/18 • • with auxiliary fluid assisting discharge
5/181 • • Bulkheads or central bodies in the discharge opening
5/185 • • Dust collectors
5/187 • • • forming an integral part of the vortex chamber
5/20 • with heating or cooling, e.g. quenching, means
5/22 • with cleaning means
5/23 • • using liquids
5/24 • Multiple arrangement thereof
5/26 • • for series flow
5/28 • • for parallel flow
5/30 • • Recirculation constructions in or with cyclones which accomplish a partial recirculation of the medium, e.g. by means of conduits

**7/00** **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**

**9/00** **Combinations with other devices, e.g. fans** (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)

**11/00** **Accessories, e.g. safety or control devices, not otherwise provided for**

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

**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)**

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.

**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

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**1/00** **Nozzles, spray heads or other outlets, with or without auxiliary devices such as valves, heating means** (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)
1/02 • 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)
1/04 • • in flat form, e.g. fan-like, sheet-like
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)
1/14 • with multiple outlet openings (B05B 1/02, B05B 1/26 take precedence); with strainers in or outside the outlet opening
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
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)

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 **[3, 4]**

**11/00 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]**

11/02 • the flow being effected by a follower, e.g. membrane, floating piston, in container for liquid or other fluent material **[2]**

11/04 • the flow being effected by deformation of container for liquid or other fluent material **[2]**

11/06 • the spray being effected by gas or vapour flow, e.g. from a compressible bulb **[2, 3]**

**12/00 Arrangements or special adaptations of delivery controlling means in spraying systems [2]**

12/02 • for controlling time, or sequence, of delivery **[2]**

12/04 • • for sequential operation or multiple outlets **[2]**

12/06 • • for effecting pulsating flow **[2]**

12/08 • responsive to condition of liquid or other fluent material discharged, of ambient medium or of target **[2]**

12/10 • • responsive to temperature or viscosity of liquid or other fluent material discharged **[2]**

12/12 • • responsive to conditions of ambient medium or target, e.g. humidity, temperature **[2]**

12/14 • for supplying a selected one of a plurality of liquids or other fluent materials to a single spray outlet **[3]**

**13/00** **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]**

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)

13/04 • • the spray heads being moved during operation

13/06 • specially designed for treating the inside of hollow bodies (spray heads B05B 1/00-B05B 7/00)

**15/00** **Details of spraying plant or apparatus not otherwise provided for; Accessories [4]**

15/02 • Arrangements or devices for cleaning discharge openings

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)

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)

15/08 • • Means for adjusting position of spray heads

15/10 • Arrangements for moving spray heads automatically to or from the working position

15/12 • Spray booths **[4]**

**17/00** **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]**

17/04 • operating with special methods

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) **[2]**

**Note(s)**

1. 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.
2. Hand tools or apparatus using hand-held tools are classified in group B05C 17/00.

**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

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**1/00** **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]**

1/02 • for applying liquid or other fluent material to separate articles

1/04 • for applying liquid or other fluent material to work of indefinite length

1/06 • • by rubbing contact, e.g. by brushes, by pads

1/08 • • using a roller **[2]**

1/10 • • • the liquid or other fluent material being supplied from inside the roller

1/12 • • • the work being fed round the roller (B05C 1/10 takes precedence)

1/14 • • using a travelling band **[2]**

1/16 • • only at particular parts of the work

**3/00** **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]**

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

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

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)

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) **[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 **[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) **[2]**
17/005 • for discharging material through an outlet orifice by pressure (B05C 17/02 takes precedence) **[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) **[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]**
19/02 • using fluidised-bed technique **[2]**
19/04 • the particulate material being projected, poured or allowed to flow onto the surface of the work (B05C 19/02 takes precedence) **[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 [2]**

**B05D PROCESSES FOR APPLYING LIQUIDS OR OTHER FLUENT MATERIALS TO SURFACES, IN GENERAL** (conveying articles or workpieces through baths of liquid B65G, e.g. B65G 49/02) **[2]**

**Note(s)**

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.

**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

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**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 **[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 **[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 [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 **[2]**
5/10 • to obtain an adhesive surface **[2]**
5/12 • to obtain a coating with specific electrical properties **[2]**

**7/00 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]**

7/02 • to macromolecular substances, e.g. rubber **[2]**
7/04 • • to surfaces of films or sheets **[2]**
7/06 • to wood **[2]**
7/08 • • using synthetic lacquers or varnishes **[2]**
7/10 • • • based on cellulose derivatives **[2]**
7/12 • to leather **[2]**
7/14 • to metal, e.g. car bodies **[2]**
7/16 • • using synthetic lacquers or varnishes **[2]**
7/18 • • • based on cellulose derivatives **[2]**
7/20 • to wires **[2]**
7/22 • to internal surfaces, e.g. of tubes **[2]**
7/24 • for applying particular liquids or other fluent materials **[2]**
7/26 • • synthetic lacquers or varnishes (B05D 7/08, B05D 7/16 take precedence) **[2]**

## 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.

**1/00 Processes or apparatus for generating mechanical vibrations of infrasonic, sonic or ultrasonic frequency**

1/02 • making use of electrical energy (B06B 1/18, B06B 1/20 take precedence)

1/04 • • operating with electromagnetism (dynamo-electric motors with vibrating magnet, armature or coil system H02K 33/00)

1/06 • • operating with piezo-electric effect or with electrostriction (piezo-electric or electrostrictive elements in general H01L 41/00)

1/08 • • operating with magnetostriction (magnetostrictive elements in general H01L 41/00)

1/10 • making use of mechanical energy (B06B 1/18, B06B 1/20 take precedence)

1/12 • • operating with systems involving reciprocating masses

1/14 • • • the masses being elastically coupled

1/16 • • operating with systems involving rotary unbalanced masses

1/18 • wherein the vibrator is actuated by pressure fluid (B06B 1/20 takes precedence)

1/20 • making use of a vibrating fluid

**3/00 Processes or apparatus specially adapted for transmitting mechanical vibrations of infrasonic, sonic or ultrasonic frequency**

3/02 • involving a change of amplitude

3/04 • involving focusing or reflecting

## 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

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**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]**
13/065 • • Apparatus for grading or sorting using divergent conveyor belts or cables **[3]**
13/07 • • Apparatus in which aggregates or articles are moved along or past openings which increase in size in the direction of movement **[3]**
13/075 • • Apparatus comprising moving article-receiving openings, the size of which varies as they move **[3]**
13/08 • according to weight (B07B 13/10 takes precedence)
13/10 • using momentum effects
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]**
13/14 • Details or accessories
13/16 • • Feed or discharge arrangements
13/18 • • Control

**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** (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**

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

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**5/00 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** (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 calipering 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 per se 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
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 conveyors 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)**

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 C03C, 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.

**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

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**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 or articles on a conveyor

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 conveyors **[5]**
9/26 • • • • • Rotating conveyors **[5]**
9/28 • • • the apparatus cleaning by splash, spray or jet application, with or without soaking **[5]**
9/30 • • • • and having conveyors **[5]**
9/32 • • • • • Rotating conveyors **[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-wares
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]**

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

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

**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


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**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
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)
1/24 • • in a continuous process
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 Rolling materials of special alloys so far as the composition of the alloy requires or permits special rolling methods or sequences** (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 Extending closed shapes of metal bands by rolling** (manufacture of circular shapes, e.g. wheel rims, B21H 1/06)

**9/00 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**

**11/00 Subsidising the rolling processes by subjecting rollers or work to vibrations**

**13/00 Metal-rolling stands, i.e. an assembly composed of a stand frame, rolls, and accessories** (B21B 17/00-B21B 23/00 take precedence; details, component parts, accessories, auxiliary means, procedures in connection with metal rolling, see 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
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)

**15/00 Arrangements for performing additional metal-working operations specially combined with or arranged in, or specially adapted for use in connection with, metal-rolling mills**
15/02 • in which work is subjected to permanent internal twisting, e.g. for producing reinforcement bars for concrete

**Rolling methods or mills specially designed for making or processing tubes**

**17/00 Tube-rolling by rollers of which the axes are arranged essentially perpendicular to the axis of the work, e.g. "axial" tube-rolling**
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 Tube-rolling by rollers arranged outside the work and having their axes not perpendicular to the axis of the work** (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 Pilgrim-step tube-rolling**
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 Tube-rolling not restricted to methods provided for in only one of groups B21B 17/00-B21B 21/00, e.g. combined processes** (B21B 25/00 takes precedence)

**25/00 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**
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]**

**39/00 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** (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)

39/02 • Feeding or supporting work; Braking or tensioning arrangements

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)

39/06 • • Pushing or forcing work into pass

39/08 • • Braking or tensioning arrangements

39/10 • • Arrangement or installation of feeding rollers in rolling stands

39/12 • • Arrangement or installation of roller tables in relation to a roll stand

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)

39/16 • • immediately before entering or after leaving the pass

39/18 • • Switches for directing work in metal-rolling mills or trains

39/20 • Revolving, turning-over, or like manipulation of work (guides in which work is subjected to permanent internal twisting B21B 15/02)

39/22 • • by tipping, e.g. by lifting one side by levers or wedges (B21B 39/26, B21B 39/28 take precedence)

39/24 • • by tongs or grippers

39/26 • • by members, e.g. grooved, engaging opposite sides of the work and moved relatively to each other to revolve the work

39/28 • • by means of guide members shaped to revolve the work during its passage

39/30 • • by lodging it in a rotating ring manipulator or ring segment manipulator

39/32 • • Devices specially adapted for turning sheets

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

**41/00 Guiding, conveying, or accumulating easily-flexible work, e.g. wire, sheet metal bands, in loops or curves; Loop lifters**

41/02 • Returning work to repeat the pass or passes

41/04 • • above or underneath the rolling stand or rolls

41/06 • in which the direction of movement of the work is turned through approximately 180°

41/08 • without overall change in the general direction of movement of the work

41/10 • • Loop deflectors

41/12 • Arrangements of interest only with respect to provision for indicating or controlling operations

**43/00 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** (conveying means in general B65G)

43/02 • Cooling beds comprising rakes or bars (B21B 43/10 takes precedence) **[2]**

43/04 • Cooling beds comprising rolls or worms

43/06 • Cooling beds comprising carriages (B21B 43/08 takes precedence)

43/08 • Cooling beds comprising revolving drums or recycling chains

43/10 • Cooling beds with other work-shifting elements projecting through the bed

43/12 • Devices for positioning workpieces "flushed", i.e. with all their axial ends arranged in line on cooling beds or on co-operating conveyors **[2]**

**45/00 Devices for surface treatment of work, specially combined with or arranged in, or specially adapted for use in connection with, metal-rolling mills** (B21B 15/00 takes precedence; technical features of scaling-off devices B21C 43/00)

45/02 • for lubricating, cooling, or cleaning

45/04 • for de-scaling

45/06 • • of strip material (B21B 45/08 takes precedence)

45/08 • • hydraulically

**47/00 Auxiliary arrangements, devices or methods in connection with rolling of multi-layer sheets of metal** (soaking pits C21D 9/70) **[2]**

47/02 • for folding sheets before rolling

47/04 • for separating layers after rolling

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

## 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
General methods.....1/00
Auxiliary operations.....5/00, 9/00
Equipment.....3/00, 19/00
METAL EXTRUDING
General methods.....23/00
Auxiliary operations.....29/00, 33/00, 35/00
Equipment.....25/00, 26/00, 27/00
Control.....31/00
DETAILS COMMON TO DRAWING AND EXTRUDING OF METAL.....43/00
MANUFACTURING NOT OTHERWISE PROVIDED FOR.....37/00

AUXILIARY OPERATIONS USED IN CONNECTION WITH METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL

Reeling.....47/00
Other auxiliary operations.....45/00, 51/00
Auxiliary equipment.....19/00, 49/00

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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

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**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
25/08 • Dies or mandrels with section variable during extruding, e. g for making tapered work; Controlling variation
25/10 • Making tools by operations not covered by a single other subclass

**26/00 Rams or plungers for metal extruding; Discs therefor [2]**

**27/00 Containers for metal to be extruded** (B21C 29/02 takes precedence)
27/02 • for making coated work
27/04 • Venting metal-container chamber

**29/00 Cooling or heating extruded work or parts of the extrusion press**
29/02 • of containers for metal to be extruded
29/04 • of press heads, dies, or mandrels

**31/00 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)

**33/00 Feeding extrusion presses with metal to be extruded**
33/02 • the metal being in liquid form

**35/00 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]**
35/02 • Removing or drawing-off work
35/03 • • Straightening the work (metal straightening in general B21D)
35/04 • Cutting-off or removing waste
35/06 • Cleaning dies, ducts, containers or mandrels **[2]**

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**37/00 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]**
37/02 • of sheets
37/04 • of rods or wire
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)
37/08 • • Making tubes with welded or soldered seams (involving only a soldering or welding operation B23K)
37/083 • • • Supply, or operations combined with supply, of strip material
37/087 • • • using rods or strips of soldering material
37/09 • • • of coated strip material
37/10 • • Making tubes with riveted seams
37/12 • • Making tubes or metal hoses with helically arranged seams
37/14 • • Making tubes from doubled flat material
37/15 • • Making tubes of special shape; Making the fittings
37/16 • • • Making tubes with varying diameter in longitudinal direction
37/18 • • • • conical tubes
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
37/22 • • • Making finned or ribbed tubes by fixing strip or like material to tubes (making heat exchangers B21D 53/02)
37/24 • • • • annularly-ribbed tubes
37/26 • • • • helically-ribbed tubes
37/28 • • • Making tube fittings for connecting pipes, e.g. U-pieces
37/29 • • • • Making branched pieces, e.g. T-pieces
37/30 • • Finishing tubes, e.g. sizing, burnishing

**43/00 Devices for cleaning metal products combined with or specially adapted for use with machines or apparatus provided for in this subclass**
43/02 • combined with or specially adapted for use in connection with drawing or winding machines or apparatus
43/04 • • Devices for de-scaling wire or like flexible work

**Auxiliary operations used in connection with metal working without essentially removing material**

**45/00 Separating mandrels from work or vice versa**

**47/00 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)
47/02 • Winding-up or coiling
47/04 • • on or in reels or drums, without using a moving guide (reels or drums B21C 47/28)
47/06 • • • with loaded rollers, bolts, or equivalent means holding the material on the reel or drum
47/08 • • without making use of a reel or drum, the first turn being formed by a stationary guide
47/10 • • by means of a moving guide
47/12 • • • the guide moving parallel to the axis of the coil (B21C 47/14 takes precedence)
47/14 • • • by means of a rotating guide, e.g. laying the material around a stationary reel or drum
47/16 • Unwinding or uncoiling
47/18 • • from reels or drums
47/20 • • • the unreeled material moving transversely to the tangent line of the drum, e.g. axially, radially
47/22 • • Unwinding coils without reels or drums
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 • • expansible or contractible
47/32 • Tongs or gripping means specially adapted for reeling operations

47/34 • Feeding or guiding devices not specially adapted to a particular type of apparatus

**49/00 Devices for temporarily accumulating material**

**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**

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

## B21D WORKING OR PROCESSING OF SHEET METAL OR METAL TUBES, RODS OR PROFILES WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING (working or processing of wire B21F)

**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**


TREATMENT CHARACTERISED BY FUNCTION
Straightening....1/00, 3/00, 25/00
Bending....11/00
of sheets....5/00, 13/00
of rods....7/00, 13/00
of tubes....9/00, 15/00
Twisting....11/00
Corrugating or grooving or bending into waves....13/00, 15/00, 17/00
Punching, stamping, deep- drawing, spinning, high-energy forming....22/00-28/00
EDGE TREATMENT; CONNECTION OF PARTS....19/00, 41/00, 39/00
OTHER METHODS....25/00, 31/00, 41/00
COMBINED PROCESSES....21/00, 35/00
HANDLING....43/00, 45/00
OTHER AUXILIARY OPERATIONS....33/00
TOOLS....37/00
SAFETY....55/00
SPECIAL TREATMENT FOR THE MANUFACTURE OF SPECIFIED ARTICLES....47/00-53/00


**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 [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**

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
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)

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 **[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; Twisting [2]**
11/02 • Bending by stretching or pulling over a die
11/06 • Bending into helical or spiral form; Forming a succession of return bends, e.g. serpentine form
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 • Joggling
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**
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 [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
17/04 • by rolling

**19/00 Flanging or other edge treatment, e.g. of tubes**
19/02 • by continuously-acting tools moving along the edge
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. by armouring
19/16 • Reverse flanging of tube ends

**21/00 Combined processes according to methods covered by groups B21D 1/00-B21D 19/00**

**<u>Stamping; Spinning; Deep-drawing; Working sheet metal of limited length by stretching; Punching</u>**

**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
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)
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 by using rigid devices or tools or yieldable or resilient pads, e.g. shaping by applying fluid pressure or magnetic forces**
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; 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 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; embossing decorations or marks B44B 5/00)
31/02 • Stabbing or piercing, e.g. for making sieves
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) **[2]**
31/06 • Deforming sheet metal, tubes or profiles by sequential impacts, e.g. hammering, beating, peen forming

**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 • • Pivotally-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)**; 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 unpiling
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**

**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 is classified 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; Subsequent re-forming
51/16 • characterised by the use of the objects (making heat exchangers B21D 53/02)
51/18 • • vessels, e.g. tubs, vats, tanks, sinks, or the like
51/20 • • • barrels
51/22 • • • pots, e.g. for cooking
51/24 • • high-pressure containers, e.g. boilers, bottles
51/26 • • cans or tins; Closing cans or tins in a permanent manner (making outlet arrangements B21D 51/38) **[2]**
51/28 • • • Folding the longitudinal seam
51/30 • • • Folding the circumferential seam
51/32 • • • • by rolling
51/34 • • • • by pressing
51/36 • • collapsible or like thin-walled tubes, e.g. for toothpaste
51/38 • • Making inlet or outlet arrangements of cans, tins, baths, bottles or other vessels; Making can ends; Making closures
51/40 • • • Making outlet openings, e.g. bung holes
51/42 • • • • Making or attaching spouts
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 them B67B)
51/46 • • • • Placing sealings or sealing material
51/48 • • • • Making crown caps
51/50 • • • • Making screw caps
51/52 • • boxes, cigarette cases, or the like
51/54 • • cartridge cases, e.g. for ammunition, for letter carriers in pneumatic-tube plants

**53/00 Making other particular articles** (making chains or chain parts B21L)

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]**
53/04 • • of sheet metal
53/06 • • of metal tubes
53/08 • • of both metal tubes and sheet metal
53/10 • parts of bearings; sleeves; valve seats or the like
53/12 • • cages for bearings
53/14 • belts, e.g. machine-gun belts
53/16 • rings, e.g. barrel hoops
53/18 • • of hollow or C-shaped cross-section, e.g. for curtains, for eyelets
53/20 • • washers, e.g. for sealing
53/22 • • • with means for preventing rotation
53/24 • nuts or like thread-engaging members
53/26 • wheels or the like
53/28 • • gear wheels
53/30 • • wheel rims
53/32 • • wheel covers
53/34 • • brake drums
53/36 • clips, clamps, or like fastening or attaching devices, e.g. for electric installation
53/38 • locksmith's goods, e.g. handles
53/40 • • hinges, e.g. door hinge plates
53/42 • • keys
53/44 • fancy goods, e.g. jewellery products
53/46 • haberdashery, e.g. buckles, combs; pronged fasteners, e.g. staples
53/48 • • buttons, e.g. press-buttons, snap fasteners
53/50 • • metal slide-fastener parts
53/52 • • • fastener elements; Attaching such elements so far as this procedure is combined with the process for making the elements
53/54 • • • slides
53/56 • • • stops
53/58 • end-pieces for laces or ropes
53/60 • cutlery wares; garden tools or the like
53/62 • • spoons; table forks
53/64 • • knives; scissors; cutting blades (B21D 53/72 takes precedence; handle portions B21D 53/70)
53/66 • • spades; shovels (handle portions B21D 53/70)
53/68 • • rakes, garden forks, or the like (handle portions B21D 53/70)
53/70 • • handle portions (B21D 53/72 takes precedence)
53/72 • • sickles; scythes
53/74 • frames for openings, e.g. for windows, doors, handbags
53/76 • writing or drawing instruments, e.g. writing pens, erasing pens
53/78 • propeller blades; turbine blades
53/80 • dustproof covers; safety covers
53/82 • perforated music sheets; pattern sheets, e.g. for control purposes, stencils
53/84 • other parts for engines, e.g. connecting-rods
53/86 • other parts for bicycles or motorcycles
53/88 • other parts for vehicles, e.g. cowlings, mudguards
53/90 • • axle-housings
53/92 • other parts for aircraft

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**55/00 Safety devices protecting the machine or the operator, specially adapted for apparatus or machines dealt with in this subclass**

**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

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**Wire working characterised by operations performed**

**1/00 Bending wire other than coiling; Straightening wire**
1/02 • Straightening
1/04 • Undulating
1/06 • Bending wire-eyes

**3/00 Coiling wire into particular forms**
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

**5/00 Upsetting wire** (in the manufacture of nails or pins B21G 3/12)

**7/00** **Twisting wire; Twisting wire together** (for connections of limited size B21F 15/04)

**9/00** **Straining wire** (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

**11/00** **Cutting wire** (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)

**13/00** **Splitting wire**

**15/00** **Connecting wire to wire or other metallic material or objects; Connecting parts by means of wire** (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

**17/00** **Jacketing or reinforcing articles with wire** (by winding B65H 54/00, B65H 81/00; by braiding D04C)

**19/00** **Metallic coating of wire** (by extruding B21C 23/24; by soldering or welding, e.g. cladding or plating, B23K; by other non-mechanical means C23; electroplating C25D)

**23/00** **Feeding wire in wire-working machines or apparatus** (applicable also to feeding rods or strips B21D 43/00)

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

**25/00** **Making barbed wire**

**27/00** **Making wire network, i.e. wire nets** (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

**29/00** **Making fencing or like material made partly of wire** (B21F 25/00, B21F 27/00 take precedence) **[2]**
29/02 • comprising bars or the like connected by wires

**31/00** **Making meshed-ring network from wire**

**33/00** **Tools or devices specially designed for handling or processing wire fabrics or the like**
33/02 • Mounting of wire network on frames
33/04 • Connecting ends of helical springs for mattresses

**35/00** **Making springs from wire** (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

**37/00** **Manufacture of rings from wire** (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)

**39/00** **Making wheel spokes from wire**

**41/00** **Making umbrella frames or members from wire**

**43/00** **Making bands, e.g. bracelets, or wire** (making chains B21L; using looms D03D)

**45/00** **Wire-working in the manufacture of other particular articles** (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
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

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**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 Making gear wheels**
5/02 • with cylindrical outline
5/04 • bevel gears

**7/00 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)
7/02 • spades; shovels
7/04 • hoes
7/06 • ploughshares; axes
7/08 • forks; rakes
7/10 • knives; sickles; scythes
7/12 • horse-shoes; articles of like shape, e.g. wear-resisting attachments for shoes
7/14 • knurled articles
7/16 • turbine blades; compressor blades; propeller blades
7/18 • grooved pins; Rolling grooves, e.g. oil grooves, in articles

**8/00 Rolling metal of indefinite length in repetitive shapes specially designed for the manufacture of particular objects**
8/02 • Rolls of special shape

**9/00 Feeding arrangements for rolling machines or apparatus manufacturing articles dealt with in this subclass**
9/02 • for screw-rolling machines

**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

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**1/00** **Preparing metal stock**
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)
1/04 • Shaping in the rough solely by forging or pressing
1/06 • Heating or cooling methods or arrangements specially adapted for performing forging or pressing operations

**3/00** **Lubricating during forging or pressing** (lubricating in general F16N)

**5/00** **Methods for forging, hammering, or pressing** (for working sheet metal or metal tubes, rods, or profiles B21D; for working wire B21F)**; Special equipment or accessories therefor**
5/02 • Die forging; Trimming by making use of special dies
5/04 • by directly applied fluid pressure or explosive action
5/06 • for performing particular operations
5/08 • • Upsetting
5/10 • • Piercing billets (in combination with extrusion B21C 23/00)
5/12 • • Forming profiles on internal or external surfaces (making screw-thread by forging, pressing, or hammering B21K)

**7/00** **Hammers; Forging machines with hammers or die jaws acting by impact** (hand hammers B25D; electrical features section H)
7/02 • Special design or construction
7/04 • • Power hammers
7/06 • • Drop hammers
7/08 • • • with rigidly-guided hammer
7/10 • • with both drive and hammer connected to a fulcrumed lever, e.g. tail hammers
7/12 • • • the lever being a spring, i.e. spring hammers
7/14 • • Forging machines working with several hammers
7/16 • • • in rotary arrangements
7/18 • • Forging machines working with die jaws, e.g. pivoted, movable laterally of the forging or pressing direction, e.g. for swaging
7/20 • Drives for hammers; Transmission means therefor
7/22 • • for power hammers
7/24 • • • operated by steam, air, or other gaseous pressure
7/26 • • • • operated by internal combustion
7/28 • • • operated by hydraulic or liquid pressure
7/30 • • • operated by electro-magnets
7/32 • • • operated by rotary drive, e.g. electric motor
7/34 • • • operating both the hammer and the anvil, so-called counter-tup
7/36 • • for 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** **Forging presses**
9/02 • Special design or construction
9/04 • • Piercing presses
9/06 • • Swawing presses; Upsetting presses
9/08 • • • equipped with devices for heating the workpiece (electric heating elements H05B)
9/10 • Drives for forging presses
9/12 • • operated by hydraulic or liquid pressure
9/14 • • • in conjunction with electric power
9/16 • • • in conjunction with steam or gas power
9/18 • • operated by making use of gearing mechanisms, e.g. levers, spindles, crankshafts, eccentrics, toggle-levers, rack bars
9/20 • • Control devices specially adapted to forging presses not restricted to one of the preceding subgroups

**11/00** **Forging hammers combined with forging presses; Forging machines with provision for hammering and pressing**

**13/00** **Details of machines for forging, pressing, or hammering**
13/02 • Dies or mountings therefor **[2]**
13/03 • • Die mountings **[2]**
13/04 • Frames; Guides
13/06 • Hammer tups; Anvils; Anvil blocks
13/08 • Accessories for handling work or tools
13/10 • • Manipulators (in general B25J)
13/12 • • • Turning means
13/14 • • Ejecting devices

**15/00** **Riveting**
15/02 • Riveting procedures
15/04 • • Riveting hollow rivets mechanically

15/06 • • Riveting hollow rivets by means of hydraulic, liquid, or gas pressure
15/08 • • Riveting by applying heat to the end parts of the rivets to enable heads to be formed
15/10 • Riveting machines (electric heating elements H05B)
15/12 • • with tools or tool parts having a movement additional to the feed movement, e.g. spin
15/14 • • specially adapted for riveting specific articles, e.g. brake lining machines
15/16 • • Drives for riveting machines; Transmission means therefor
15/18 • • • operated by air pressure or other gas pressure, e.g. explosion pressure
15/20 • • • operated by hydraulic or liquid pressure
15/22 • • • operated by both hydraulic or liquid pressure and gas pressure
15/24 • • • operated by electro-magnets
15/26 • • • operated by rotary drive, e.g. by electric motor
15/28 • • Control devices specially adapted to riveting machines not restricted to one of the preceding subgroups
15/30 • • Particular elements, e.g. supports; Suspension equipment specially adapted for portable riveters
15/32 • • • Devices for inserting or holding rivets in position with or without feeding arrangements
15/34 • • • • for installing tubular rivets
15/36 • • Rivet sets, i.e. tools for forming heads; Mandrels for expanding parts of hollow rivets
15/38 • Accessories for use in connection with riveting, e.g. pliers for upsetting; Hand tools for riveting
15/40 • • for forming rivet heads
15/42 • • Special clamping devices for workpieces to be riveted together, e.g. operating through the rivet holes
15/44 • • Rivet hole positioners
15/46 • • Positioners for rivets for making tube joints
15/48 • • Devices for caulking rivets
15/50 • • Removing or cutting devices for rivets

**17/00** **Forge furnaces** (furnaces for heat treatment C21D 9/00; furnaces in general F27)
17/02 • electrically heated (electric heating elements H05B)

**19/00** **Blacksmiths' requisites not otherwise provided for**
19/02 • Hearths; Air supply arrangements specially adapted therefor
19/04 • Anvils; Associated items

**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

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**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)
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**
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**

**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

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**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

**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

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**1/00** **Compositions of refractory mould or core materials; Grain structures thereof** (refractory materials in general C04B 35/00)**; Chemical or physical features in the formation or manufacture of moulds**

1/02 • characterised by additives for special purposes, e.g. indicators, breakdown additives

1/04 • • for protection of the casting, e.g. against decarbonisation

1/06 • • • for casting extremely oxidisable metals

1/08 • • for decreasing shrinkage of the mould, e.g. for investment casting

1/10 • • for influencing the hardening tendency of the mould material (influencing the hardening tendency of the binding agent only B22C 1/16)

1/12 • • for manufacturing permanent moulds or cores

1/14 • • for separating the pattern from the mould

1/16 • characterised by the use of binding agents; Mixtures of binding agents

1/18 • • of inorganic agents

1/20 • • of organic agents

1/22 • • • of resins or rosins

1/24 • • • of oily or fatty substances; of distillation residues therefrom

1/26 • • • of carbohydrates; of distillation residues therefrom

**3/00** **Selection of compositions for coating the surfaces of moulds, cores, or patterns**

3/02 • specially adapted for vacuum-sealed moulding **[6]**

**5/00** **Machines or devices specially designed for dressing or handling the mould material so far as specially adapted for that purpose** (of general applicability, see the relevant places, e.g. for material with water-setting properties B28C)

5/02 • Dressing by centrifuging essentially or additionally

5/04 • by grinding, blending, mixing, kneading, or stirring

5/06 • by sieving or magnetic separating

5/08 • by sprinkling, cooling, or drying

5/10 • by dust separating

5/12 • for filling flasks (in combination with compacting B22C 15/20-B22C 15/28)

5/13 • • during vacuum-sealed moulding **[6]**

5/14 • Equipment for storing or handling the dressed mould material, forming part of a plant for preparing such material

5/16 • • with conveyors or other equipment for feeding the material

5/18 • Plants for preparing mould materials

**7/00** **Patterns; Manufacture thereof so far as not provided for in other classes**

7/02 • Lost patterns

7/04 • Pattern plates

7/05 • • for vacuum-sealed moulding **[6]**

7/06 • Core boxes

**9/00** **Moulds or cores** (uniquely adapted to particular casting processes B22D)**; Moulding processes** (processes involving the use of particular moulding machines, see the relevant groups for these machines)

9/02 • Sand moulds or like moulds for shaped castings

9/03 • • formed by vacuum-sealed moulding **[6]**

9/04 • • Use of lost patterns

9/06 • Permanent moulds for shaped castings (moulds for ingots B22D 7/06)

9/08 • Features with respect to supply of molten metal, e.g. ingates, circular gates, skim gates

9/10 • Cores; Manufacture or installation of cores

9/11 • • for vacuum-sealed moulding **[6]**

9/12 • Treating moulds or cores, e.g. drying, hardening

9/14 • • Equipment or plant specially adapted for drying moulds or cores (B22C 13/08 takes precedence)

9/16 • • • Movable drying equipment

9/18 • Finishing

9/20 • Stack moulds, i.e. arrangement of multiple moulds or flasks

9/22 • Moulds for peculiarly-shaped castings

9/24 • • for hollow articles

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. gaggers, 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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**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 conveyors

**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]**
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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]**
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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; alumino-thermic 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; alumino-thermic 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]**
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 • • • Meltable 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 (making alloys by powder metallurgy C22C); APPARATUS OR DEVICES SPECIALLY ADAPTED FOR METALLIC POWDER

**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**

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; Apparatus or devices specially adapted therefor**

9/02 • using physical processes **[3]**
9/04 • • starting from solid material, e.g. by crushing, grinding or milling **[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)**

1. 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.

2. 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.
3. 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)

**Subclass index**


TURNING
- Methods ..... 1/00
- Lathes
  - general-purpose lathes ..... 3/00
  - semi-automatic or automatic lathes ..... 7/00, 9/00, 11/00
  - for particular work ..... 5/00
  - handling, adjusting ..... 13/00, 15/00
  - component parts
    - headstocks, tailstocks, chucks ..... 19/00, 23/00, 31/00
    - tools, or holders therefor ..... 27/00, 29/00
    - other parts ..... 17/00, 21/00, 33/00
  - accessories ..... 25/00

BORING, DRILLING
- Methods ..... 35/00, 37/00
- Machines
  - general-purpose machines ..... 39/00
  - for particular work ..... 41/00
  - hand-held machines ..... 45/00
  - component parts ..... 47/00, 49/00, 51/00

DEVICES FOR ATTACHMENT TO ANY MACHINE TOOL ..... 43/00


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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**

<u>Components or accessories particularly for turning machines</u>

**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]**
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 • Liftable 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

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**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
5/04 • • Plain cutters, i.e. having essentially a cylindrical or tapered cutting surface of substantial length (B23C 5/10 takes precedence)
5/06 • • Face-milling cutters, i.e. having only or primarily a substantially flat cutting surface
5/08 • • Disc-type cutters
5/10 • • Shank-type cutters, i.e. with an integral shaft
5/12 • • Cutters specially designed for producing particular profiles (B23C 5/10 takes precedence)
5/14 • • • essentially comprising curves
5/16 • characterised by physical features other than shape
5/18 • • with permanently-fixed cutter-bits or teeth
5/20 • • with removable cutter-bits or teeth
5/22 • • • Securing arrangements for bits or teeth
5/24 • • • • adjustable
5/26 • Securing milling-cutters to the driving spindle
5/28 • Features relating to lubricating or cooling

**7/00 Milling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool**
7/02 • to lathes
7/04 • to planing or slotting machines

**9/00 Details or accessories so far as specially adapted to milling machines or cutters** (drives, control devices, or accessories, in general B23Q)

**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 • Pivotally-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

**25/00 Machines or arrangements for shearing stock while the latter is travelling otherwise than in the direction of the cut** (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 • Flying shearing machines (B23D 25/12 takes precedence; flying shears for cutting in general B26D 1/56)
25/04 • • in which a cutting unit moves bodily with the work while cutting (B23D 25/06 takes precedence)
25/06 • • having a cutting device mounted on an oscillating lever
25/08 • • having two coacting shearing blades mounted independently
25/10 • • • on co-operating beams moving parallel to each other and attached to lever mechanisms
25/12 • Shearing machines with blades on coacting rotating drums
25/14 • without regard to the exact dimensions of the resulting material, e.g. for cutting-up scrap

**27/00 Machines or devices for cutting by a nibbling action**
27/02 • 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]**
27/04 • • actuated by electric power
27/06 • • actuated by fluid or gas pressure

**29/00** **Hand-held metal-shearing or metal-cutting devices** (with nibbling action B23D 27/02; hand-operated devices for metal-cutting otherwise than by shearing B26B)
29/02 • Hand-operated metal-shearing devices

**31/00** **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**
31/02 • for performing different cutting operations on travelling stock, e.g. slitting and severing simultaneously
31/04 • for trimming stock combined with devices for shredding scrap

**33/00** **Accessories for shearing machines or shearing devices** (feeding stock to machines or removing stock B21D 43/00)
33/02 • Arrangements for holding, guiding, or feeding work during the operation
33/04 • • for making circular cuts
33/06 • • in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00)
33/08 • Press-pads; Counter-bases; Hold-down devices
33/10 • Stops for positioning work
33/12 • Equipment for indicating where to cut

**35/00** **Tools for shearing machines or shearing devices; Holders or chucks for shearing tools**

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**36/00** **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 [2]**

**Broaching**

**37/00** **Broaching machines or broaching devices**
37/02 • Broaching machines with horizontally-arranged working tools
37/04 • • for broaching inner surfaces
37/06 • • for broaching outer surfaces
37/08 • Broaching machines with vertically-arranged working tools
37/10 • • for broaching inner surfaces
37/12 • • for broaching outer surfaces
37/14 • Broaching machines with rotatably-arranged working tools
37/16 • • for broaching helical grooves
37/18 • Broaching machines with working tools mounted on an endless chain or belt
37/20 • Broaching machines with arrangements for working in opposite directions
37/22 • for special purposes (B23D 37/14 takes precedence)

**39/00** **Accessories for broaching machines or broaching devices**

**41/00** **Broaching machines or broaching devices characterised only by constructional features of particular parts** (constructional features of these parts per se B23Q)
41/02 • of frames; of work supports
41/04 • of tool-carrying arrangements
41/06 • of devices for feeding, clamping, or ejecting workpieces
41/08 • of drives; of control devices

**43/00** **Broaching tools** (for cutting gear teeth B23F 21/26)
43/02 • for cutting by rectilinear movement (B23D 43/08 takes precedence)
43/04 • • having inserted cutting edges
43/06 • for cutting by rotational movement
43/08 • mounted on an endless chain or belt

**Sawing**

**45/00** **Sawing machines or sawing devices with circular saw blades or with friction saw discs** (shearing machines with rotary discs B23D 19/00-B23D 25/00)
45/02 • with a circular saw blade or the stock mounted on a carriage
45/04 • with a circular saw blade or the stock carried by a pivoted lever
45/06 • with a circular saw blade arranged underneath a stationary work-table
45/08 • with a ring blade having inside saw teeth
45/10 • with a plurality of circular saw blades
45/12 • with a circular saw blade for cutting tubes
45/14 • for cutting otherwise than in a plane perpendicular to the axis of the stock, e.g. for making a mitred cut
45/16 • Hand-held sawing devices with circular saw blades
45/18 • 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]**
45/20 • • Flying sawing machines, the saw carrier of which is reciprocated in a guide and moves with the travelling stock during sawing
45/22 • • Flying sawing machines with lever-supported saw carrier which moves in a complete circular path
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
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

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**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)**

1. 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.
2. 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.
3. 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

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**1/00** **Making gear teeth by tools of which the profile matches the profile of the required surface** (special adaptations for making curved teeth B23F 9/00)
1/02 • by grinding
1/04 • by planing or slotting
1/06 • by milling
1/08 • by broaching; by broach-milling

**3/00** **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** (copying systems or devices per se B23Q 35/00)

**5/00** **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**
5/02 • by grinding
5/04 • • the tool being a grinding worm
5/06 • • the tool being a grinding disc with a plane front surface
5/08 • • the tool being a grinding disc having the same profile as the tooth or teeth of a rack
5/10 • • the tool being a grinding disc having the same profile as the tooth or teeth of a crown or bevel wheel
5/12 • by planing or slotting
5/14 • • the tool having the same profile as a tooth or teeth of a rack
5/16 • • the tool having a shape similar to that of a spur wheel or part thereof
5/18 • • the tool having the same profile as a tooth of a crown wheel
5/20 • by milling
5/22 • • the tool being a hob for making spur gears
5/24 • • the tool being a hob for making bevel gears
5/26 • • the tool having the same profile as a tooth or teeth of a rack, for making spur gears
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

**7/00** **Making herring-bone gear teeth**

**9/00** **Making gears having teeth curved in their longitudinal direction**
9/02 • by grinding
9/04 • by planing or slotting with reciprocating cutting tools
9/06 • • having a shape similar to a spur wheel of part thereof
9/07 • • having a shape similar to a crown wheel or a part thereof **[2]**
9/08 • by milling, e.g. with helicoidal hob
9/10 • • with a face-mill
9/12 • • • for non-continuous generating processes **[2]**
9/14 • • • for continuous generating processes **[2]**

**11/00** **Making worm wheels, e.g. by hobbing**

**13/00** **Making worms by methods essentially requiring the use of machines of the gear-cutting type** (making screw-thread B23G)
13/02 • Making worms of cylindrical shape
13/04 • • by grinding
13/06 • Making worms of globoidal shape
13/08 • • by grinding

**15/00** **Methods or machines for making gear wheels of special kinds, not covered by groups B23F 7/00-B23F 13/00**
15/02 • Making gear teeth on wheels of varying radius of operation, e.g. on elliptical wheels
15/04 • Making fine-pitch gear teeth on clock wheels or the like by special machining
15/06 • Making gear teeth on the front surface of wheels, e.g. for clutches or couplings with toothed faces
15/08 • Making intermeshing rotors, e.g. of pumps

**17/00** **Special methods or machines for making gear teeth, not covered by groups B23F 1/00-B23F 15/00**

**19/00** **Finishing gear teeth by other tools than those used for manufacturing gear teeth**
19/02 • Lapping gear teeth
19/04 • • Lapping spur gears by making use of a correspondingly shaped counterpart
19/05 • Honing gear teeth **[2]**
19/06 • Shaving the faces of gear teeth
19/10 • Chamfering the end edges of gear teeth
19/12 • • by grinding

**21/00** **Tools specially adapted for use in machines for manufacturing gear teeth**
21/02 • Grinding discs; Grinding worms (truing grinding tools B24B; grinding tools in general B24D)
21/03 • Honing tools **[2]**
21/04 • Planing or slotting tools

21/06 • • having a profile which matches a gear tooth profile
21/08 • • having the same profile as a tooth or teeth of a rack
21/10 • • Gear-shaper cutters having a shape similar to a spur wheel or part thereof
21/12 • Milling tools
21/14 • • Profile cutters of disc type
21/16 • • Hobs
21/18 • • • Taper hobs, e.g. for bevel gears
21/20 • • Fly cutters
21/22 • • Face-mills for longitudinally-curved gear teeth
21/23 • • • with cutter teeth arranged on a spiral curve for continuous generating processes **[2]**
21/24 • Broach-milling tools
21/26 • Broaching tools
21/28 • Shaving cutters

**23/00 Accessories or equipment combined with or arranged in, or specially designed to form part of, gear-cutting machines** (accessories or equipment not restricted to gear-cutting machines B23Q; tool-guiding mechanisms, see the relevant groups for making gear teeth)
23/02 • Loading or chucking arrangements for workpieces
23/04 • • Loading arrangements
23/06 • • Chucking arrangements
23/08 • Index mechanisms
23/10 • Arrangements for compensating irregularities in drives or indexing mechanisms
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

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**1/00 Thread cutting; Automatic machines specially designed therefor**
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)
1/04 • • Machines with one working-spindle
1/06 • • • specially adapted for making conical screws, e.g. wood-screws
1/08 • • Machines with a plurality of working-spindles
1/10 • • • specially adapted for making conical screws, e.g. wood-screws
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
1/14 • • • specially adapted for making conical screws, e.g. wood-screws
1/16 • in holes of workpieces by taps (B23G 1/26, B23G 1/32, B23G 1/36 take precedence)
1/18 • • Machines with one working-spindle
1/20 • • Machines with a plurality of working-spindles
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

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**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]**
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 or boring [2, 3, 2014.01]***

***Note(s) [2014.01]***

1. *This main group covers :*
   - *laser working for making a weakened layer, with or without removing material;*
   - *laser shock processing;*
   - *apparatus for laser surface treatment;*
   - *laser ablation.*
2. *This main group does not cover :*
   - *laser assisted deposition which is covered by subclass C23C;*
   - *laser sintering which is covered by group B22F 3/105 for metallic powder, by group B29C 67/04 for plastics, by group C03B 19/06 for glass or by group C04B 35/64 for ceramics;*
   - *laser assisted chemical etching which is covered by group C23F 1/00.*

*26/02 • Positioning or observing the workpiece, e.g. with respect to the point of impact; Aligning, aiming or focusing the laser beam* ***[3, 2014.01]***
26/03 • • Observing, e.g. monitoring, the workpiece **[7]**
*26/035 • • Aligning the laser beam (automatically B23K 26/042)* ***[2014.01]***
*26/04 • • Automatically aligning, aiming or focusing the laser beam, e.g. using the back-scattered light* ***[3, 2014.01]***
*26/042 • • • Automatically aligning the laser beam* ***[2014.01]***
*26/044 • • • • Seam tracking* ***[2014.01]***

*26/046* • • • *Automatically focusing the laser beam* ***[2014.01]***
*26/06* • • *Shaping the laser beam, e.g. by masks or multi-focusing* ***[3, 2014.01]***
*26/062* • • • *by direct control of the laser beam* ***[2014.01]***
*26/0622* • • • • *by shaping pulses* ***[2014.01]***
*26/064* • • • *by means of optical elements, e.g. lenses, mirrors or prisms* ***[2014.01]***
*26/066* • • • • *by using masks* ***[2014.01]***
26/067 • • • Dividing the beam into multiple beams, e.g. multi-focusing **[7]**
26/073 • • • Shaping the laser spot **[7]**
*26/08* • *Devices involving relative movement between laser beam and workpiece* ***[3, 2014.01]***
*26/082* • • *Scanning systems, i.e. devices involving movement of the laser beam relative to the laser head* ***[2014.01]***
26/10 • • using a fixed support **[3]**
*26/12* • *in a special environment or atmosphere, e.g. in an enclosure* ***[3, 2014.01]***
*26/122* • • *in a liquid, e.g. underwater* ***[2014.01]***
*26/14* • *using a fluid stream, e.g. a jet of gas, in conjunction with the laser beam; Nozzles therefor (B23K 26/12 takes precedence)* ***[3, 2014.01]***
*26/142* • • *for the removal of by-products* ***[2014.01]***
*26/144* • • *the fluid stream containing particles, e.g. powder* ***[2014.01]***
*26/146* • • *the fluid stream containing a liquid* ***[2014.01]***
26/16 • Removal of by-products, e.g. particles or vapours produced during treatment of a workpiece (by a fluid stream B23K 26/142) **[3]**
26/18 • using absorbing layers on the workpiece, e.g. for marking or protecting purposes **[3]**
*26/20* • *Bonding (soldering by means of radiant energy B23K 1/005; joining of preformed plastics parts by heating using laser beam B29C 65/16)* ***[7, 2014.01]***
*26/21* • • *by welding* ***[2014.01]***
*26/211* • • • *with interposition of special material to facilitate connection of the parts* ***[2014.01]***
26/22 • • • Spot welding **[7]**
*26/24* • • • *Seam welding* ***[7, 2014.01]***
*26/242* • • • • *Fillet welding, i.e. involving a weld of substantially triangular cross section joining two parts* ***[2014.01]***
*26/244* • • • • *Overlap seam welding* ***[2014.01]***
*26/26* • • • • *of rectilinear seams* ***[7, 2014.01]***
*26/262* • • • • • *of longitudinal seams of tubes* ***[2014.01]***
*26/28* • • • • *of curved planar seams* ***[7, 2014.01]***
*26/282* • • • • • *of tube sections* ***[2014.01]***
*26/30* • • • • *of three-dimensional seams* ***[7, 2014.01]***
*26/302* • • • • • *of helicoidal seams* ***[2014.01]***
*26/32* • • *taking account of the properties of the material involved* ***[7, 2014.01]***
*26/322* • • • *involving coated metal parts (using absorbing layers on the workpiece B23K 26/18)* ***[2014.01]***
*26/323* • • • *involving parts made of dissimilar metallic material* ***[2014.01]***
*26/324* • • • *involving non-metallic parts* ***[2014.01]***
*26/34* • *Laser welding for purposes other than joining* ***[7, 2014.01]***
*26/342* • • *Build-up welding* ***[2014.01]***
*26/346* • *in combination with welding or cutting covered by groups B23K 5/00-B23K 25/00, e.g. in combination with resistance welding* ***[2014.01]***
*26/348* • • *in combination with arc heating, e.g. TIG [tungsten inert gas], MIG [metal inert gas] or plasma welding (laser beam for starting a welding or cutting arc B23K 9/067)* ***[2014.01]***
*26/351* • *for trimming or tuning of electrical components* ***[2014.01]***
*26/352* • *for surface treatment* ***[2014.01]***
*26/354* • • *by melting* ***[2014.01]***
*26/356* • • *by shock processing* ***[2014.01]***
*26/359* • • *by providing a line or line pattern, e.g. a dotted break initiation line* ***[2014.01]***
*26/36* • *Removing material (B23K 26/55, B23K 26/57 take precedence)* ***[7, 2014.01]***
*26/361* • • *for deburring or mechanical trimming (B23K 26/351 takes precedence)* ***[2014.01]***
*26/362* • • *Laser etching* ***[2014.01]***
*26/364* • • • *for making a groove or trench, e.g. for scribing a break initiation groove* ***[2014.01]***
*26/38* • • *by boring or cutting* ***[7, 2014.01]***
*26/382* • • • *by boring* ***[2014.01]***
*26/384* • • • • *of specially shaped holes* ***[2014.01]***
*26/386* • • • • *of blind holes* ***[2014.01]***
*26/388* • • • • *Trepanning, i.e. boring by moving the beam spot about an axis* ***[2014.01]***
*26/40* • • *taking account of the properties of the material involved* ***[7, 2014.01]***
*26/402* • • • *involving non-metallic material, e.g. isolators* ***[2014.01]***
*26/50* • *Working by transmitting the laser beam through or within the workpiece* ***[2014.01]***
*26/53* • • *for modifying or reforming the material inside the workpiece, e.g. for producing break initiation cracks* ***[2014.01]***
*26/55* • • *for creating voids inside the workpiece, e.g. for forming flow passages or flow patterns* ***[2014.01]***
*26/57* • • *the laser beam entering a face of the workpiece from which it is transmitted through the workpiece material to work on a different workpiece face, e.g. for effecting removal, fusion splicing, modifying or reforming* ***[2014.01]***
*26/60* • *Preliminary treatment* ***[2014.01]***
*26/70* • *Auxiliary operations or equipment* ***[2014.01]***

**28/00** **Welding or cutting not covered by groups B23K 5/00-B23K 26/00** (joining workpieces by electrolysis C25D 2/00; electrolytic removal of materials C25F) **[2]**
*28/02* • *Combined welding or cutting procedures or apparatus* ***[2, 2014.01]***

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**31/00** **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** (making tubes or profiled bars involving operations other than soldering or welding B21C 37/04, B21C 37/08)
31/02 • relating to soldering or welding (dip or wave soldering in the manufacture of printed circuits H05K 3/34)
31/10 • relating to cutting or desurfacing
31/12 • relating to investigating the properties, e.g. the weldability, of materials **[5]**

**33/00** **Specially-profiled edge portions of workpieces for making soldering or welding connections; Filling the seams formed thereby**

**35/00 Rods, electrodes, materials, or media, for use in soldering, welding, or cutting**

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
35/12 • • not specially designed for use as electrodes
35/14 • • • for soldering
35/16 • • • of non-circular cross-section; with special arrangement, e.g. internal (B23K 35/14 takes precedence)
35/18 • • • • multi-cored; multiple
35/20 • • • • with more than one layer of coating or sheathing material
35/22 • characterised by the composition or nature of the material
35/24 • • Selection of soldering or welding materials proper (B23K 35/34 takes precedence)
35/26 • • • with the principal constituent melting at less than 400°C
35/28 • • • with the principal constituent melting at less than 950°C
35/30 • • • with the principal constituent melting at less than 1550°C
35/32 • • • with the principal constituent melting at more than 1550°C
35/34 • • comprising compounds which yield metals when heated
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]**
35/362 • • • Selection of compositions of fluxes (B23K 35/365, B23K 35/368 take precedence) **[2]**
35/363 • • • • for soldering or brazing **[4]**
35/365 • • • Selection of non-metallic compositions of coating materials either alone or conjoint with selection of soldering or welding materials **[2]**
35/368 • • • Selection of non-metallic compositions of core materials either alone or conjoint with selection of soldering or welding materials **[2]**
35/38 • • Selection of media, e.g. special atmospheres for surrounding the working area
35/40 • Making wire or rods for soldering or welding (processes involving a single technical art, see the relevant subclasses, e.g. B05D, B21C)

**37/00 Auxiliary devices or processes, not specially adapted to a procedure covered by only one of the other main groups of this subclass** (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)

37/02 • Carriages for supporting the welding or cutting element
37/04 • for holding or positioning work
37/047 • • moving work to adjust its position between soldering, welding or cutting steps (B23K 37/053 takes precedence) **[5]**
37/053 • • aligning cylindrical work; Clamping devices therefor **[5]**
37/06 • for positioning the molten material, e.g. confining it to a desired area
37/08 • for flash removal **[5]**

**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


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**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** **Connecting or disconnecting metal parts or objects by metal-working techniques, not otherwise provided for** (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]**

11/02 • by first expanding and then shrinking or vice versa, e.g. by using pressure fluids; by making force fits

**13/00** **Making metal objects by operations essentially involving machining but not covered by a single other subclass** (making specific objects B23P 15/00)

13/02 • in which only the machining operations are important

13/04 • involving slicing of profiled material

**15/00** **Making specific metal objects by operations not covered by a single other subclass or a group in this subclass**

15/02 • turbine or like blades from one piece

15/04 • turbine or like blades from several pieces

15/06 • piston rings from one piece

15/08 • piston rings from several pieces

15/10 • pistons

15/12 • gratings

15/14 • gear parts, e.g. gear wheels

15/16 • plates with holes of very small diameter e.g. for spinning or burner nozzles

15/18 • brake shoes

15/20 • railroad requirements, e.g. buffers

15/22 • cartridges or like shells

15/24 • dies (B21C 3/18, B21C 25/10, B21D 37/20 take precedence)

15/26 • heat exchangers

15/28 • cutting tools (sawing tools B23D 63/00, B23D 65/00; files or rasps B23D 73/00)

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
15/52 • • • taps

**17/00 Metal-working operations, not covered by a single other subclass or another group in this subclass**
17/02 • Single metal-working processes; Machines or apparatus therefor
17/04 • characterised by the nature of the material involved or the kind of product independently of its shape
17/06 • • Making steel wool or the like

**19/00 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** (hand tools in general B25) **[3]**
19/02 • for connecting objects by press fit or for detaching same (B23P 19/10 takes precedence) **[1, 7]**
19/027 • • using hydraulic or pneumatic means (B23P 19/033 takes precedence) **[7]**
19/033 • • using vibration **[7]**
19/04 • for assembling or disassembling parts (B23P 19/10 takes precedence) **[1, 7]**
19/06 • • Screw or nut setting or loosening machines
19/08 • • Machines for placing washers, circlips, or the like on bolts or other members
19/10 • Aligning parts to be fitted together **[7]**
19/12 • • Alignment of parts for insertion into bores **[7]**

**21/00 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**

**23/00 Machines or arrangements of machines for performing specified combinations of different metal-working operations not covered by a single other subclass** (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, see the relevant subclass for the operation)
23/02 • Machine tools for performing different machining operations (lathes, e.g. capstan lathes, B23B)
23/04 • for both machining and other metal-working operations
23/06 • Metal-working plant comprising a number of associated machines or apparatus

**25/00 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**

## B23Q DETAILS, COMPONENTS, OR ACCESSORIES FOR MACHINE TOOLS, e.g. ARRANGEMENTS FOR COPYING OR CONTROLLING (tools of the kind used in lathes or boring machines B23B 27/00); 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

**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

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**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 conveyors (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 conveyors; Arranging work on conveyors, e.g. varying spacing between individual workpieces **[2]**
7/18 • • Orienting work on conveyors **[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]**
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** (by electro-erosion B23H; abrasive or related blasting B24C; electrolytic etching or polishing C25F 3/00)**; 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

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**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 (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)

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 15/06)
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 **[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

**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 **[4]**
7/04 • involving a rotary work-table
7/06 • involving conveyor 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
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 **[4]**
7/16 • • for grinding end faces, e.g. of gauges, rollers, nuts or piston rings (for combined grinding of surfaces of revolution and of adjacent plane surfaces on work B24B 5/01) **[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
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**

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 televison 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**

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

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**17/00** **Special adaptations of machines or devices for grinding controlled by patterns, drawings, magnetic tapes or the like; Accessories therefor [4]**

17/02 • involving mechanical transmission means only
17/04 • involving optical auxiliary means, e.g. optical projection form grinding machines
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** (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 **[4]**
19/12 • • for grinding cams or camshafts
19/14 • for grinding turbine blades, propeller blades or the like **[4]**
19/16 • for grinding sharp-pointed workpieces, e.g. needles, pens, fish hooks, tweezers or record player styli (polishing of needles B24B 29/08) **[4]**
19/18 • • for grinding carding equipment, e.g. card-clothings
19/20 • for grinding dies
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 or magnetic recording heads **[4]**
19/28 • • for grinding shoes or linings of drum brakes **[4]**

**21/00** **Machines or devices using grinding or polishing belts** (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 **[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; dust extraction equipment B24B 55/10) **[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** (for grinding or polishing using belts B24B 21/00) **[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** (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 conveyor 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 adapted for machines covered by group B24B 31/00 **[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
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; Accessories** (B24B 3/00 takes precedence) **[1, 2012.01]**

37/005 • Control means for lapping machines or devices **[2012.01]**
37/013 • • Devices or means for detecting lapping completion **[2012.01]**
37/015 • • Temperature control **[2012.01]**
37/02 • designed for working surfaces of revolution **[1, 2012.01]**
37/025 • • designed for working spherical surfaces **[2012.01]**
37/04 • designed for working plane surfaces **[1, 2012.01]**
37/07 • • characterised by the movement of the work or lapping tool **[2012.01]**
37/08 • • • for double side lapping **[2012.01]**
37/10 • • • for single side lapping **[2012.01]**
37/11 • Lapping tools **[2012.01]**
37/12 • • Lapping plates for working plane surfaces **[2012.01]**
37/14 • • • characterised by the composition or properties of the plate materials **[2012.01]**
37/16 • • • characterised by the shape of the lapping plate surface, e.g. grooved **[2012.01]**
37/20 • • Lapping pads for working plane surfaces **[2012.01]**
37/22 • • • characterised by a multi-layered structure **[2012.01]**
37/24 • • • characterised by the composition or properties of the pad materials **[2012.01]**
37/26 • • • characterised by the shape of the lapping pad surface, e.g. grooved **[2012.01]**
37/27 • Work carriers **[2012.01]**
37/28 • • for double side lapping of plane surfaces **[2012.01]**
37/30 • • for single side lapping of plane surfaces **[2012.01]**
37/32 • • • Retaining rings **[2012.01]**
37/34 • Accessories **[2012.01]**

**39/00 Burnishing machines or devices, i.e. requiring pressure members for compacting the surface zone; 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 (B24B 37/27 takes precedence) **[1, 2012.01]**

**45/00 Means for securing grinding wheels on rotary arbors**

**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, B24B 37/005 take precedence; if applicable to other machine tools, B23Q 15/00-B23Q 17/00 take precedence) **[1, 2012.01]**
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]**
49/06 • • requiring comparison of the workpiece with standard gauging plugs, rings or the like
49/08 • involving liquid or pneumatic means
49/10 • involving electrical means (B24B 49/02, B24B 49/08 take precedence)
49/12 • involving optical means
49/14 • taking regard of the temperature during grinding
49/16 • taking regard of the load
49/18 • taking regard of the presence of dressing tools

**51/00 Arrangements for automatic control of a series of individual steps in grinding a workpiece**

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**53/00 Devices or means for dressing or conditioning abrasive surfaces [4]**
53/007 • Cleaning of grinding wheels **[4]**
53/013 • Application of loose grinding agent as auxiliary tool during truing operation **[4]**
53/017 • Devices or means for dressing, cleaning or otherwise conditioning lapping tools **[2012.01]**
53/02 • of plane surfaces on abrasive tools (B24B 53/017 takes precedence) **[1, 2012.01]**
53/04 • of cylindrical or conical surfaces on abrasive tools or wheels (B24B 53/017 takes precedence) **[4, 2012.01]**
53/047 • • equipped with one or more diamonds **[4]**
53/053 • • using a rotary dressing tool **[4]**
53/06 • of profiled abrasive wheels
53/065 • • having other than straight profiles, e.g. crowned (B24B 53/07 takes precedence) **[4]**
53/07 • • by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls **[4]**
53/075 • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/07 takes precedence) **[4]**
53/08 • • controlled by information means, e.g. patterns, templets, punched tapes or the like
53/085 • • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/09 takes precedence) **[4]**
53/09 • • • having transfer elements formed as pantograph mechanism **[4]**
53/095 • Cooling or lubricating during dressing operation **[4]**
53/10 • of travelling flexible backings coated with abrasives; Cleaning of abrasive belts **[4]**
53/12 • Dressing tools; Holders therefor **[4]**
53/14 • • Dressing tools equipped with rotary rollers or cutters; Holders therefor **[4]**

**55/00 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**
55/02 • Equipment for cooling the grinding surfaces, e.g. devices for feeding coolant (incorporated in grinding wheels B24D) **[4]**
55/03 • • designed as a complete equipment for feeding or clarifying coolant **[4]**
55/04 • Protective covers for the grinding wheel

55/05 • • specially designed for portable grinding machines **[4]**
55/06 • Dust extraction equipment on grinding or polishing machines (B24B 31/12 takes precedence)
55/08 • • specially designed for belt grinding machines **[4]**
55/10 • • specially designed for portable grinding machines, e.g. hand-guided **[4]**
55/12 • 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]**

**57/00 Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents** (for abrasive blasting B24C 1/00, B24C 7/00) **[4]**
57/02 • for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents **[4]**
57/04 • for feeding of solid grinding, polishing or lapping agents **[4]**

## 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 Methods for use of abrasive blasting for producing particular effects; Use of auxiliary equipment in connection with such methods**
1/02 • for sharpening or cleaning cutting tools, e.g. files
1/04 • for treating only selected parts of a surface, e.g. for carving stone or glass
1/06 • for producing matt surfaces, e.g. on plastic materials, on glass
1/08 • for polishing surfaces, e.g. by making use of liquid-borne abrasives
1/10 • 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)

**3/00 Abrasive blasting machines or devices; Plants**
3/02 • characterised by the arrangement of the component assemblies with respect to each other (B24C 3/08, B24C 3/18 take precedence)
3/04 • • stationary
3/06 • • movable; portable
3/08 • essentially adapted for abrasive blasting of travelling stock or travelling workpieces
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 (abrading-bodies specially designed for tumbling apparatus, e.g. abrading-balls B24B 31/14; honing tools B24B 33/08; lapping tools B24B 37/11)

**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

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**3/00 Physical features of abrasive bodies, or sheets, e.g. abrasive surfaces of special nature; Abrasive bodies or sheets characterised by their constituents**

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
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

**7/00 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**

7/02 • Wheels in one piece
7/04 • • with reinforcing means
7/06 • with inserted abrasive blocks, e.g. segmental
7/08 • • with reinforcing means
7/10 • with cooling provisions
7/12 • with apertures for inspecting the surface to be abraded
7/14 • Zonally-graded wheels; Composite wheels comprising different abrasives
7/16 • Bushings; Mountings
7/18 • Wheels of special form

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**9/00 Wheels or drums supporting in exchangeable arrangement a layer of flexible abrasive material, e.g. sandpaper**

9/02 • Expansible drums for carrying flexible material in tubular form, e.g. expanded by centrifugal force
9/04 • Rigid drums for carrying flexible material
9/06 • • able to be stripped-off from a built-in delivery spool
9/08 • Circular back-plates for carrying flexible material
9/10 • • with suction means for securing the material

**11/00 Constructional features of flexible abrasive materials; Special features in the manufacture of such materials**

11/02 • Backings, e.g. foils, webs, mesh fabrics
11/04 • Zonally-graded surfaces
11/06 • Connecting the ends of materials, e.g. for making abrasive belts
11/08 • Equipment for after-treatment of the coated backings, e.g. for flexing the coating

**13/00 Wheels having flexibly-acting working parts, e.g. buffing wheels; Mountings therefor**

13/02 • acting by their periphery
13/04 • • comprising a plurality of flaps or strips arranged around the axis
13/06 • • the flaps or strips being individually attached
13/08 • • comprising annular or circular sheets packed side by side
13/10 • • comprising assemblies of brushes
13/12 • • comprising assemblies of felted or spongy material, e.g. felt, steel wool, foamed latex
13/14 • acting by the front face
13/16 • • comprising pleated flaps or strips
13/18 • with cooling provisions
13/20 • Mountings for the wheels

**15/00 Hand tools or other devices for non-rotary grinding, polishing, or stropping**

15/02 • rigid; with rigidly-supported operative surface
15/04 • resilient; with resiliently-mounted operative surface
15/06 • specially designed for sharpening cutting edges
15/08 • • of knives; of razors
15/10 • • of safety-razor blades (devices with mechanically-operated parts B24B 3/50)

**18/00** **Manufacture of grinding tools, e.g. wheels, not otherwise provided for [4]**

**99/00** **Subject matter not provided for in other groups of this subclass [2010.01]**

# 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


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**1/00** **Vices** (specially adapted for tying flies for angling A01K 97/28; specially adapted for machine tools B23Q 3/00) **[5]**

1/02 • with sliding jaws
1/04 • with pivoted jaws
1/06 • Arrangements for positively actuating jaws
1/08 • • using cams
1/10 • • using screws
1/12 • • • with provision for disengagement
1/14 • • using toggle links
1/16 • • by pedal, with or without provision for additional manual actuation
1/18 • • motor driven, e.g. with fluid drive, with or without provision for manual actuation
1/20 • Vices for clamping work of special profile, e.g. pipes
1/22 • Arrangements for turning or tilting vices
1/24 • Details, e.g. jaws of special shape, slideways

**3/00** **Hand vices, i.e. vices intended to be held by hand; Pin vices**

**5/00** **Clamps** (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)

5/02 • with sliding jaws
5/04 • with pivoted jaws
5/06 • Arrangements for positively actuating jaws
5/08 • • using cams
5/10 • • using screws
5/12 • • using toggle links
5/14 • Clamps for work of special profile
5/16 • Details, e.g. jaws, jaw attachments

**7/00** **Pliers; Other hand-held gripping tools with jaws on pivoted limbs; Details applicable generally to pivoted-limb hand tools** (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)

7/02 • Jaws
7/04 • • adjustable
7/06 • Joints
7/08 • • with fixed fulcrum
7/10 • • with adjustable fulcrum
7/12 • involving special transmission means between the handles and the jaws, e.g. toggle levers, gears
7/14 • Locking means
7/16 • • combined with means for tightening the operating arms or jaws

7/18 • Adjusting means for the operating arms
7/20 • Pliers for sealing
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)

**9/00** **Hand-held gripping tools other than those covered by group B25B 7/00** (wrenches B25B 13/00; specially adapted for watchmakers' or like use G04D)
9/02 • without sliding or pivotal connections, e.g. tweezers, one-piece tongs
9/04 • with sliding jaws

**11/00** **Work holders or positioners not covered by groups B25B 1/00-B25B 9/00, e.g. magnetic work holders, vacuum work holders** (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)
11/02 • Assembly jigs

**13/00** **Spanners; Wrenches** (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)
13/02 • with rigid jaws (B25B 13/46, B25B 13/48 take precedence)
13/04 • • of ring jaw type
13/06 • • of socket type
13/08 • • of open jaw type
13/10 • with adjustable jaws (B25B 13/46, B25B 13/48 take precedence)
13/12 • • the jaws being slidable
13/14 • • • by rack and pinion, worm or gear
13/16 • • • by screw or nut
13/18 • • • by cam, wedge, or lever
13/20 • • • Arrangements for locking the jaws
13/22 • • • • by ratchet action or toothed bars
13/24 • • • • by cam, wedge, or friction means
13/26 • • • • by toggle links
13/28 • • the jaws being pivotally movable
13/30 • • • by screw or nut
13/32 • • • by cam, wedge, or lever
13/34 • • • Arrangements for locking the jaws
13/36 • • • • by ratchet action
13/38 • • • • by cam, wedge, or friction means
13/40 • • • • by toggle links
13/42 • • • • with self-locking action
13/44 • of the chuck type
13/46 • of the ratchet type, for providing a free return stroke of the handle
13/48 • for special purposes
13/50 • • for operating on work of special profile, e.g. pipes
13/52 • • • Chain or strap wrenches
13/54 • • • Internal grip wrenches
13/56 • Spanner sets
13/58 • Jaw attachments

**15/00** **Screwdrivers** (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
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)**

1. In this subclass, the following term is used with the meaning indicated:
   - "nail" includes pin, bolt, stud, plug or the like.
2. 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

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**1/00** **Hand-held nailing tools** (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)**; Nail feeding devices therefor [4]**

1/02 • operated by manual power **[3]**
1/04 • operated by fluid pressure **[3]**
1/06 • operated by electric power
1/08 • operated by combustion pressure
1/10 • • generated by detonation of a cartridge
1/12 • • • acting directly on the nail
1/14 • • • acting on an intermediate plunger or anvil (pistols for slaughtering or stunning animals A22B 3/02)
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)
1/18 • • • Details or accessories, e.g. splinter guards, spall minimisers

**3/00** **Portable devices for holding and guiding nails; Nail dispensers**

**5/00** **Manually operated portable stapling tools; Hand-held power-operated stapling tools** (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)**; Staple feeding devices therefor** (surgical staples A61B 17/064; staples F16B 15/00) **[3, 4, 5]**

5/02 • with provision for bending the ends of the staples on to the work
5/04 • • with means for forming the staples in the tool
5/06 • without provision for bending the ends of the staples on to the work
5/08 • • with means for forming the staples in the tool
5/10 • Driving means
5/11 • • operated by manual power **[3]**
5/13 • • operated by fluid pressure **[3]**
5/15 • • operated by electric power **[3]**

5/16 • Staple-feeding devices

**7/00 Accessories for nailing or stapling tools, e.g. supports** (for tools operated by detonation of a cartridge B25C 1/18)

**9/00 Nail punches**

**11/00 Nail, spike, or staple extractors** (incorporated in hammers B25D 1/00)

11/02 • Pincers (joints therefor B25B 7/06)

**13/00 Nail straightening devices**

## B25D PERCUSSIVE TOOLS [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

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**1/00 Hand hammers; Hammer heads of special shape or materials**

1/02 • Inserts or attachments forming the striking part of hammer heads (B25D 1/08-B25D 1/14 take precedence) **[5]**

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 **[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**

**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)

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** (centrifugal or rotary impact type B25D 15/00)

**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 [3]**

**17/00 Details of, or accessories for, portable power-driven percussive tools [4]**

17/02 • Percussive tool bits

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

17/11 • Arrangements of noise damping means **[3]**

17/12 • • of exhaust silencers **[3]**

17/14 • Removing or laying dust

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

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**
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**

**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**

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

**5/00 Tool, instrument or work supports or storage means used in association with vehicles; Workers' supports, e.g. mechanics' creepers**

**7/00 Marking-out or setting-out work** (appliances or methods for marking-out, perforating, or making buttonholes A41H 25/00; cord line chalkers B44D 3/38)

7/02 • Plates having a flat surface
7/04 • Devices, e.g. scribers, 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

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**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

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**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**

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**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

**19/00 Clippers or shavers operating with a plurality of cutting edges, e.g. hair clippers, dry shavers**
19/02 • of the reciprocating-cutter type
19/04 • • Cutting heads therefor; Cutters therefor; Securing equipment thereof
19/06 • • • involving co-operating cutting elements both of which have shearing teeth
19/08 • • • • of nipper type
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
19/12 • of the oscillating-cutter type; Cutting heads therefor; Cutters therefor (B26B 19/04 takes precedence)
19/14 • of the rotary-cutter type; Cutting heads therefor; Cutters therefor (B26B 19/04 takes precedence)
19/16 • • involving a knife cylinder or a knife cone or separate cutting elements moved like a rotating cylinder or a rotating cone
19/18 • • • in combination with a fixed razor-blade without shearing perforations
19/20 • with provision for shearing hair of preselected or variable length
19/22 • with provision for thinning-out hair
19/24 • specially adapted for shearing animals, e.g. sheep
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
19/28 • Drive layout for hair clippers or dry shavers, e.g. providing for electromotive drive (electric motors per se H02)
19/30 • • providing for muscle drive, e.g. by rolling over the skin
19/32 • • providing for mechanical drive, e.g. installation of a spring motor
19/34 • • providing for fluid drive
19/36 • • providing for remote drive by means of a flexible shaft; Transmission means therefor
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)
19/40 • • Lubricating
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 per se A45D 27/38)
19/44 • • Suction means for collecting severed hairs or for the skin to be shaved
19/46 • • providing for illuminating the area to be shaved or clipped
19/48 • • Accessory implements for carrying out a function other than cutting hair, e.g. attachable appliances for manicuring (massage means per se A61H 7/00-A61H 23/00)

**21/00 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**
21/02 • involving unchangeable blades
21/04 • • Razors of the knife type
21/06 • • Safety razors with fixed blade, e.g. with moulded-in blade
21/08 • involving changeable blades
21/10 • • Safety razors with one or more blades arranged longitudinally to the handle
21/12 • • • combined with combs or other means for hair trimming
21/14 • • Safety razors with one or more blades arranged transversely to the handle
21/16 • • • involving blades with only one cutting edge (B26B 21/22-B26B 21/38 take precedence)
21/18 • • • involving blades with two cutting edges (B26B 21/22-B26B 21/38 take precedence)
21/20 • • • involving blades with more than two cutting edges; involving disc blades (B26B 21/22-B26B 21/38 take precedence)
21/22 • • • involving several blades to be used simultaneously
21/24 • • • of the magazine type; of the injector type (containers for storing razor-blades A45D 27/24)
21/26 • • • of the continuous ribbon type
21/28 • • • of the drawing cut type, i.e. with the cutting edge of the blade arranged obliquely to the handle
21/30 • • • of the type carrying pivotally-mounted caps
21/32 • • • • in razors involving double-edged blades
21/34 • • • of the type carrying rollers
21/36 • • • • with provision for reciprocating the blade (reciprocating the cutting elements of clippers or dry shavers B26B 19/00)
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)
21/40 • Details or accessories
21/42 • • for cutting hair of preselected or variable length (combs, stencils or guides specially adapted for hair trimming devices A45D 24/36)
21/44 • • Means integral with, or attached to, the razor for storing shaving-cream, styptic, or the like
21/46 • • for illuminating the skin (B26B 19/46 takes precedence)
21/48 • • Heating means
21/50 • • Means integral with, or attached to, the razor for stropping the blade
21/52 • • Handles, e.g. tiltable, flexible
21/54 • Razor-blades

21/56 • • characterised by the shape **[3]**
21/58 • • characterised by the material **[3]**
21/60 • • • by the coating material **[3]**

**23/00 Axes; Hatchets**

**25/00 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]**

**27/00 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**

**29/00 Guards or sheaths for hand cutting tools; Arrangements for guiding hand cutting tools** (guards for hair clippers or dry shavers B26B 19/38) **[5]**
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 PERFORATING, PUNCHING, CUTTING-OUT, STAMPING-OUT OR SEVERING** (disintegrating by knives or other cutting or tearing members which chop material into fragments B02C 18/00; cutting by abrasive fluid jets B24C 5/02; hand-held cutting tools B26B) **[2, 5]**

**Note(s)**

1. 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.
2. 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

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**1/00 Cutting through work characterised by the nature or movement of the cutting member; Apparatus or machines therefor; Cutting members therefor [3]**
1/01 • involving a cutting member which does not travel with the work **[3]**
1/02 • • having a stationary cutting member (B26D 1/547 takes precedence) **[3]**
1/03 • • • with a plurality of cutting members **[3]**
1/04 • • having a linearly-movable cutting member (B26D 1/46, B26D 1/547 take precedence) **[3]**
1/06 • • • wherein the cutting member reciprocates **[3]**
1/08 • • • • of the guillotine type **[3]**
1/09 • • • • • with a plurality of cutting members **[3]**
1/10 • • • • in, or substantially in, a direction parallel to the cutting edge **[3]**
1/11 • • • • • with a plurality of cutting members **[3]**
1/12 • • having a cutting member moving about an axis (B26D 1/547 takes precedence) **[3]**
1/14 • • • with a circular cutting member, e.g. disc cutter **[3]**
1/143 • • • • rotating about a stationary axis (B26D 1/20-B26D 1/24 take precedence) **[3]**
1/147 • • • • • with horizontal cutting member **[3]**
1/15 • • • • • with vertical cutting member **[3]**
1/153 • • • • • with inclined cutting member **[3]**
1/157 • • • • rotating about a movable axis (B26D 1/20-B26D 1/24 take precedence) **[3]**
1/16 • • • • • mounted on a movable arm or the like **[3]**
1/18 • • • • • mounted on a movable carriage **[3]**
1/20 • • • • coacting with a fixed member **[3]**
1/22 • • • • coacting with a movable member, e.g. a roller (B26D 1/24 takes precedence) **[3]**
1/24 • • • • coacting with another disc cutter **[3]**
1/25 • • • with a non-circular cutting member **[3]**
1/26 • • • • moving about an axis substantially perpendicular to the line of cut **[3]**
1/28 • • • • • and rotating continuously in one direction during cutting **[3]**
1/29 • • • • • • with cutting member mounted in the plane of a rotating disc, e.g. for slicing beans **[3]**
1/30 • • • • • with limited pivotal movement to effect cut **[3]**
1/34 • • • • moving about an axis parallel to the line of cut **[3]**
1/36 • • • • • and rotating continuously in one direction during cutting, e.g. mounted on a rotary cylinder **[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 **[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 or stamping-out B26F 1/38)
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
3/16 • Cutting rods or tubes transversely
3/18 • to obtain cubes or the like **[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 takes precedence) **[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

**7/00 Details of apparatus for cutting, cutting-out, stamping-out, punching, perforating, or severing by means other than cutting [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
7/08 • Means for treating work or cutting member to facilitate cutting (tensioning band cutters B26D 1/48)
7/10 • • by heating (severing with heated members B26F 3/08)
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
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
7/27 • Means for performing other operations combined with cutting (B26D 9/00 takes precedence) **[3]**
7/28 • • for counting the number of cuts or measuring cut lengths (B26D 5/24, B26D 5/40 take precedence) **[3]**
7/30 • • for weighing cut product **[3]**
7/32 • • for conveying or stacking cut product (means for removing cut-out material or waste B26D 7/18) **[3]**
7/34 • • for applying a coating, such as butter, to cut product **[3]**

**9/00 Cutting apparatus combined with punching or perforating apparatus or with dissimilar cutting apparatus**

**11/00 Combinations of several similar cutting apparatus**

**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)**

1. 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.
2. Attention is drawn to Notes (1) and (2) following the title of subclass B26D.

**1/00 Perforating; Punching; Cutting-out; Stamping-out; Apparatus therefor** (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)

1/02 • Perforating by punching, e.g. with relatively-reciprocating punch and bed
1/04 • • with selectively-operable punches
1/06 • • with punching tools moving with the work
1/08 • • • wherein the tools are carried by, and in operation move relative to, a rotative drum or similar support
1/10 • • • Roller type punches
1/12 • • to notch margins of work
1/14 • • Punching tools; Punching dies
1/16 • Perforating by tool or tools of the drill type
1/18 • Perforating by slitting, i.e. forming cuts closed at their ends without removal of material
1/20 • • with tools carried by a rotating drum or similar support (B26F 1/22 takes precedence)
1/22 • • to form non-rectilinear cuts, e.g. for tabs
1/24 • Perforating by needles or pins
1/26 • Perforating by non-mechanical means, e.g. by fluid jet
1/28 • • by electrical discharges
1/31 • • by radiation **[3]**
1/32 • Hand-held perforating or punching apparatus, e.g. awls
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]**
1/36 • • Punching or perforating pliers
1/38 • Cutting-out; Stamping-out
1/40 • • using a press, e.g. of the ram type (presses in general B30B)
1/42 • • • having a pressure roller
1/44 • • Cutters therefor; Dies therefor
1/46 • • • Loose press knives

**3/00 Severing by means other than cutting; Apparatus therefor** (severing by grinding B24B 27/06)

3/02 • Tearing
3/04 • Severing by squeezing (B26F 3/08 takes precedence)
3/06 • Severing by using heat (severing by laser beam B23K 26/00)
3/08 • • with heated members
3/10 • • • with heated rollers or discs
3/12 • • • with heated wires
3/16 • • by radiation **[3]**

## 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

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**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 counter-balancing (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 counter-balancing
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
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

**7/00** **Sawing machines working with circular saw blades, specially designed for length sawing of trunks**

7/02 • by making use of circular saws mounted substantially at right angles, e.g. vertically and horizontally
7/04 • by making use of a plurality of circular saws mounted on a single spindle; Arrangements for adjusting the mutual distances

**9/00** **Portable power-driven circular saws for manual operation** (details or components, e.g. handles, casings, of portable power-driven tools not particularly related to the operation performed B25F 5/00) **[4]**

9/02 • Arrangements for adjusting the cutting depth or the amount of tilting
9/04 • Guiding equipment, e.g. for cutting panels

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**11/00** **Cross-cut reciprocating saws with power drive; Appurtenances therefor**

11/02 • Arrangements for guiding the saw blade
11/04 • • Supports able to be attached to the work
11/06 • Arrangements for chucking the saw blade, with or without releasable transmission mechanisms for uncoupling the drive
11/08 • Frames, pillars, or beds
11/10 • Devices for clamping the work or holding same in position

11/12 • Saw assemblies designed to be mounted on or driven by tractors

**Band or strap sawing machines**

**13/00 Band or strap sawing machines** (for length cutting of trunks B27B 15/00)**; Components or equipment therefor**
13/02 • Frames, Pillars
13/04 • Work-tables; Arrangements for tilting the band saw blade
13/06 • Saw pulleys; Bearings therefor
13/08 • Arrangements for stretching the band saw blade
13/10 • Guiding equipment for the band saw blade, e.g. guide rollers, back guides, side guides
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
13/16 • Accessories, e.g. for cooling the saw blade

**15/00 Band or strap sawing machines specially designed for length cutting of trunks**
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
15/08 • with a plurality of band saw blades

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**17/00 Chain saws; Equipment therefor**
17/02 • Chain saws equipped with guide bar (B27B 17/06 takes precedence)
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

**19/00 Other reciprocating saws with power drive; Fret-saws** (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00) **[4]**
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)
19/04 • • characterised by power drive, e.g. by electromagnetic drive
19/06 • • Stationary machines
19/09 • • portable **[2]**
19/10 • Fret-saws, i.e. with bilaterally-chucked saw blade in a manually-guided bow
19/12 • • with power drive
19/14 • • with hand drive

**21/00 Hand saws without power drive** (B27B 19/14 takes precedence)**; Equipment for hand sawing, e.g. saw horses**
21/02 • Buck or hack saws
21/04 • Cross-cut saws; Pad saws
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

**23/00 Other cutting of wood by non-rotary toothed tools; Tools therefor** (cutting with hot wire B27M 1/06)

**Components or accessories for saws**

**25/00 Feeding devices for timber in saw mills or sawing machines; Feeding devices for trees** (B27B 31/00 takes precedence) **[5]**
25/02 • with feed and pressure rollers
25/04 • with feed chains or belts
25/06 • Resilient feeding or pressing accessories, e.g. pads, springs
25/08 • Feeding devices able to be attached to any sawing machine
25/10 • Manually-operated feeding or pressing accessories, e.g. pushers

**27/00 Guide fences or stops for timber in saw mills or sawing machines; Measuring equipment thereon** (safety guards or devices specially designed for wood saws B27G 19/00; constructional features of measuring devices G01B)
27/02 • arranged laterally and parallel with respect to the plane of the saw blade
27/04 • arranged perpendicularly to the plane of the saw blade
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 FOR WORKING WOOD OR SIMILAR MATERIALS; TOOLS FOR WORKING WOOD OR SIMILAR MATERIALS** (tools for grinding B24D; 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 FOR WOOD WORKING MACHINES OR TOOLS**

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

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**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 specially adapted for working wood or similar materials [2]**

**13/00 Cutter blocks; Other rotary cutting tools specially adapted for working wood or similar materials** (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**

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**23/00 Gauging means specially designed for adjusting of tools or guides, e.g. adjusting cutting blades in cutter blocks** (for arrangement on manually operated saws B27B 21/08; 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; CHEMICAL OR PHYSICAL TREATMENT OF CORK, CANE, REED, STRAW OR SIMILAR MATERIALS [2]

**1/00 Dampening wood**
1/02 • Apparatus

**3/00 Impregnating wood, e.g. for protection** (combined impregnating and drying B27K 5/04)
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 Staining or dyeing wood; Bleaching wood; Treating of wood not provided for in groups B27K 1/00 or B27K 3/00**
5/02 • Staining or dyeing wood; Bleaching wood
5/04 • Combined bleaching or impregnating and drying of wood
5/06 • Softening or hardening wood (by impregnating involving polymerisation B27K 3/15)

**7/00 Chemical or physical treatment of cork**

**9/00 Chemical or physical treatment of reed, straw, or similar material**

## 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]**

**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

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**1/00** **Producing shaped articles from the material** (using presses B28B 3/00; shaping on moving conveyors 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 conveyors 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 conveyors irrespective of the manner of shaping**

5/02 • on conveyors 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
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 conveyors
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 conveyors or jigging conveyors
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

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**7/00 Mixing; Kneading** (in general B01F; combined with calendering B29C 43/24, with injection B29C 45/46, 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
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Blow-moulding....49/00
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OTHER SHAPING TECHNIQUES
Bending, folding, twisting, straightening, flattening....53/00
Stretching....55/00
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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

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**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]**
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 • • Conveyors 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]**

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 making and attaching of elements of slide fasteners [4]**

5/02 • the fasteners having separate interlocking members **[4]**

5/04 • the interlocking members being formed by continuous meander of filamentary material **[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]**

5/10 • the interlocking members being formed by continuous profiled strip **[4]**

**7/00** **Producing flat articles, e.g. films or sheets** (B29D 24/00 takes precedence) **[4]**

7/01 • Films or sheets **[4]**

**11/00** **Producing optical elements, e.g. lenses or prisms [4]**

11/02 • Artificial eyes from organic plastic material

**12/00 Producing frames**
12/02 • Spectacle frames

**15/00 Producing gear wheels or similar articles with grooves or projections, e.g. control knobs**

**16/00 Producing articles with corrugations** (B29D 23/18 takes precedence) **[4]**

**17/00 Producing carriers of records containing fine grooves or impressions, e.g. disc records for needle playback or cylinder records; Producing record discs from master stencils [4, 6]**

**19/00 Producing buttons or semi-finished parts of buttons**
19/04 • by cutting, milling, turning, stamping, or perforating moulded parts; Surface treatment of buttons
19/06 • • Devices for feeding semi-finished parts to the processing machines
19/08 • • Making holes in buttons or in semi-finished parts thereof

**21/00 Producing hair combs or similar toothed or slotted articles**
21/04 • by sawing, milling, cutting, or similar operations
21/06 • Polishing

**22/00 Producing hollow articles** (tubular articles B29D 23/00; pneumatic tyres B29D 30/00) **[4]**
22/02 • Inflatable articles **[7]**
22/04 • Spherical articles, e.g. balls (B29D 22/02 takes precedence) **[7]**

**23/00 Producing tubular articles** (B29D 24/00 takes precedence) **[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]**

**24/00 Producing articles with hollow walls [4]**

**25/00 Producing frameless domes**

**28/00 Producing nets or the like [4]**

**29/00 Producing belts or bands [4]**
29/06 • Conveyor belts **[4]**
29/08 • Toothed driving belts **[4]**
29/10 • Driving belts having wedge-shaped cross-section **[4]**

**30/00 Producing pneumatic or solid tyres or parts thereof** (producing inner tubes B29D 23/24; connection of valves to inflatable elastic bodies B60C 29/00) **[4]**
30/02 • Solid tyres **[4]**
30/04 • Resilient fillings for rubber tyres; Filling tyres therewith **[4]**
30/06 • Pneumatic tyres or parts thereof **[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]**
30/12 • • • • Cores **[4]**
30/14 • • • • Rolling-down or pressing-down the layers in the building process **[4]**
30/16 • • • • Applying the layers; Guiding or stretching the layers during application **[4]**
30/18 • • • • Fitting the bead-rings or bead-cores; Folding the textile layers around the rings or cores **[4]**
30/20 • • • by the flat-tyre method, i.e. building on cylindrical drums **[4]**
30/22 • • • • Breaker plies being applied in the unexpanded state **[4]**
30/24 • • • • Drums **[4]**
30/26 • • • • • Accessories or details, e.g. membranes or transfer rings **[4]**
30/28 • • • • Rolling-down or pressing-down the layers in the building process **[4]**
30/30 • • • • Applying the layers; Guiding or stretching the layers during application **[4]**
30/32 • • • • Fitting the bead-rings or bead-cores; Folding the textile layers around the rings or cores **[4]**
30/34 • • • by jointly covering two bead-rings, located parallel to each other at a distance apart, with fabric or cord layers **[4]**
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]**
30/38 • • Textile inserts, e.g. cord or canvas layers, for tyres; Treatment of inserts prior to building the tyre (manufacture of layers comprising fibrous parallel reinforcements of substantial or continuous length B29C 70/20) **[4]**
30/40 • • • Chemical pretreatment of textile inserts before building the tyre **[4]**
30/42 • • • Endless textile bands without bead-rings **[4]**
30/44 • • • Stretching or treating the layers before application on the drum **[4]**
30/46 • • • Cutting textile inserts to required shape **[4]**
30/48 • • Bead-rings or bead-cores; Treatment thereof prior to building the tyre **[4]**
30/50 • • • Covering, e.g. by winding, the separate bead-rings or bead-cores with textile material, e.g. with flipper strips **[4]**
30/52 • • Unvulcanised treads, e.g. on used tyres; Retreading **[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

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**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]**

**35/00 Use of polymers of unsaturated polycarboxylic acids as moulding material [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]**

**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]**
55/02 • ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers **[4]**

**59/00 Use of polyacetals as moulding material [4]**

**61/00 Use of condensation polymers of aldehydes or ketones, as moulding material [4]**
61/04 • Phenoplasts **[4]**
61/20 • Aminoplasts **[4]**

**63/00 Use of epoxy resins as moulding material [4]**

**67/00 Use of polyesters as moulding material [4]**

**69/00 Use of polycarbonates as moulding material [4]**

**71/00 Use of polyethers as moulding material [4]**

**73/00 Use of other polymers having oxygen as the only hetero atom in the main chain, as moulding material [4]**

**75/00 Use of polyureas or polyurethanes as moulding material [4]**

**77/00 Use of polyamides, e.g. polyesteramides, as moulding material [4]**

**79/00 Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, as moulding material [4]**

**81/00 Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, as moulding material [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]**

**85/00 Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, as moulding material [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]**

**91/00 Use of waxes as moulding material [4]**

**95/00 Use of bituminous materials as moulding material [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]**
96/02 • Graft polymers **[4]**
96/04 • Block polymers **[4]**

**101/00 Use of unspecified macromolecular compounds as moulding material** (use of unspecified rubbers B29K 21/00) **[4]**
101/10 • Thermosetting resins **[4]**
101/12 • Thermoplastic materials **[6]**

**103/00 Use of resin-bonded materials as moulding material [4]**
103/04 • Inorganic materials **[4]**
103/06 • • Metal powders, metal carbides or the like **[4]**
103/08 • • Mineral aggregates, e.g. sand, clay or the like **[4]**

**105/00 Condition, form or state of moulded material [4]**
105/02 • heat-shrinkable **[4]**
105/04 • cellular or porous **[4]**
105/06 • containing reinforcements, fillers or inserts **[4]**
105/08 • • of continuous length, e.g. cords, rovings, mats, fabrics, strands or yarns **[4]**
105/10 • • • oriented **[4]**
105/12 • • of short lengths, e.g. chopped filaments, staple fibres or bristles **[4]**
105/14 • • • oriented **[4]**
105/16 • • Fillers **[4]**
105/18 • • • oriented **[4]**
105/20 • • Inserts **[4]**
105/22 • • • metallic **[4]**
105/24 • cross-linked or vulcanised **[4]**
105/26 • Scrap **[4]**
105/28 • opaque **[4]**
105/30 • reflecting **[4]**
105/32 • transparent **[4]**
105/34 • insulating **[4]**

**Compositions for reinforcements [6]**

**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]**

**233/00 Use of polymers of unsaturated acids or derivatives thereof, as reinforcement** (B29K 235/00 takes precedence) **[6]**
233/04 • Polymers of esters **[6]**
233/18 • Polymers of nitriles **[6]**
233/20 • • PAN, i.e. polyacrylonitrile **[6]**

**235/00 Use of polymers of unsaturated polycarboxylic acids as reinforcement [6]**

**245/00 Use of polymers of unsaturated cyclic compounds having no unsaturated aliphatic groups in a side-chain, e.g. coumarone-indene resins, as reinforcement [6]**

**255/00 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 223/00-B29K 245/00, as reinforcement [6]**
255/02 • ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers **[6]**

**259/00 Use of polyacetals as reinforcement [6]**

**261/00 Use of condensation polymers of aldehydes or ketones, as reinforcement [6]**
261/04 • Phenoplasts **[6]**
261/20 • Aminoplasts **[6]**

**263/00 Use of epoxy resins as reinforcement [6]**

**267/00** **Use of polyesters as reinforcement [6]**

**269/00** **Use of polycarbonates as reinforcement [6]**

**271/00** **Use of polyethers as reinforcement [6]**

**273/00** **Use of other polymers having oxygen as the only hetero atom in the main chain, as reinforcement [6]**

**275/00** **Use of polyureas or polyurethanes as reinforcement [6]**

**277/00** **Use of polyamides, e.g. polyesteramides, as reinforcement [6]**

**279/00** **Use of other polymers having nitrogen, with or without oxygen or carbon only, in the main chain, as reinforcement [6]**

**281/00** **Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, as reinforcement [6]**

**283/00** **Use of polymers having silicon, with or without sulfur, nitrogen, oxygen or carbon only, in the main chain, as reinforcement [6]**

**285/00** **Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, as reinforcement [6]**

**286/00** **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 [6]**

**295/00** **Use of bituminous materials as reinforcement [6]**

**296/00** **Use of specific macromolecular materials not provided for in a single one of main groups B29K 201/00-B29K 295/00, as reinforcement [6]**
296/02 • Graft polymers **[6]**
296/04 • Block polymers **[6]**

**301/00** **Use of unspecified macromolecular compounds as reinforcement** (use of unspecified rubbers B29K 221/00) **[6]**
301/10 • Thermosetting resins **[6]**
301/12 • Thermoplastic materials **[6]**

**303/00** **Use of resin-bonded materials as reinforcement [6]**
303/04 • Inorganic materials **[6]**
303/06 • • Metal powders, metal carbides or the like **[6]**
303/08 • • Mineral aggregates, e.g. sand, clay or the like **[6]**

**305/00** **Use of metals, their alloys or their compounds, as reinforcement [6]**

**Note(s)**

Alloys or compounds of specified metals are indexed with the same code as the specified metals.

305/02 • Aluminium **[6]**
305/04 • Lead **[6]**
305/06 • Tin **[6]**
305/08 • Transition metals **[6]**
305/10 • • Copper **[6]**
305/12 • • Iron **[6]**

**307/00** **Use of elements other than metals as reinforcement [6]**
307/02 • Boron **[6]**
307/04 • Carbon **[6]**

**309/00** **Use of inorganic materials not provided for in groups B29K 303/00-B29K 307/00, as reinforcement [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** **Use of natural products or their composites, not provided for in groups B29K 201/00-B29K 309/00, as reinforcement [6]**
311/02 • Cork **[6]**
311/04 • Linoleum **[6]**
311/06 • Bone, horn or 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 or fibreboard **[6]**

**Compositions for fillers [6]**

**401/00** **Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, as filler [6]**

**407/00** **Use of natural rubber as filler [6]**

**409/00** **Use of rubber derived from conjugated dienes, as filler [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]**

**421/00** **Use of unspecified rubbers as filler [6]**

**423/00** **Use of polyalkenes as filler [6]**

**425/00** **Use of polymers of vinyl-aromatic compounds as filler [6]**

**427/00** **Use of polyvinylhalogenides as filler [6]**
427/06 • PVC, i.e. polyvinylchloride **[6]**
427/12 • containing fluorine **[6]**
427/18 • • PTFE, i.e. polytetrafluoroethene **[6]**

**429/00** **Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals as filler [6]**

**431/00** **Use of polyvinylesters as filler [6]**

**433/00** **Use of polymers of unsaturated acids or derivatives thereof, as filler** (B29K 435/00 takes precedence) **[6]**
433/04 • Polymers of esters **[6]**
433/18 • Polymers of nitriles **[6]**
433/20 • • PAN, i.e. polyacrylonitrile **[6]**

**435/00** **Use of polymers of unsaturated polycarboxylic acids as filler [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]**

**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]**

455/02 • ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers **[6]**

**459/00 Use of polyacetals as filler [6]**

**461/00 Use of condensation polymers of aldehydes or ketones, as filler [6]**

461/04 • Phenoplasts **[6]**

461/20 • Aminoplasts **[6]**

**463/00 Use of epoxy resins as filler [6]**

**467/00 Use of polyesters as filler [6]**

**469/00 Use of polycarbonates as filler [6]**

**471/00 Use of polyethers as filler [6]**

**473/00 Use of other polymers having oxygen as the only hetero atom in the main chain, as filler [6]**

**475/00 Use of polyureas or polyurethanes as filler [6]**

**477/00 Use of polyamides, e.g. polyesteramides, 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]**

**481/00 Use of polymers having sulfur, with or without nitrogen, oxygen or carbon only, in the main chain, 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]**

**485/00 Use of polymers having elements other than silicon, nitrogen, oxygen or carbon only, in the main chain, 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]**

**491/00 Use of waxes as filler [6]**

**495/00 Use of bituminous materials as filler [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]**

496/02 • Graft polymers **[6]**

496/04 • Block polymers **[6]**

**501/00 Use of unspecified macromolecular compounds as filler** (use of unspecified rubbers B29K 421/00) **[6]**

501/10 • Thermosetting resins **[6]**

501/12 • Thermoplastic materials **[6]**

**503/00 Use of resin-bonded materials as filler [6]**

503/04 • Inorganic materials **[6]**

503/06 • • Metal powders, metal carbides or the like **[6]**

503/08 • • Mineral aggregates, e.g. sand, clay or the like **[6]**

**505/00 Use of metals, their alloys or their compounds, as filler [6]**

**Note(s)**

Alloys or compounds of specified metals are indexed with the same code as the specified metals.

505/02 • Aluminium **[6]**

505/04 • Lead **[6]**

505/06 • Tin **[6]**

505/08 • Transition metals **[6]**

505/10 • • Copper **[6]**

505/12 • • Iron **[6]**

505/14 • • Noble metals, e.g. silver, gold or platinum **[6]**

**507/00 Use of elements other than metals as filler [6]**

507/02 • Boron **[6]**

507/04 • Carbon **[6]**

**509/00 Use of inorganic materials not provided for in groups B29K 503/00-B29K 507/00, as filler [6]**

509/02 • Ceramics **[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 or ivory **[6]**

511/08 • Leather **[6]**

511/10 • Natural fibres, e.g. wool or cotton **[6]**

511/12 • Paper, e.g. cardboard **[6]**

511/14 • Wood, e.g. woodboard or fibreboard **[6]**

**Compositions for preformed parts, e.g. inserts [6]**

**601/00 Use of cellulose, modified cellulose or cellulose derivatives, e.g. viscose, for preformed parts, e.g. for inserts [6]**

**607/00 Use of natural rubber for preformed parts, e.g. for inserts [6]**

**609/00 Use of rubber derived from conjugated dienes, for preformed parts, e.g. for inserts [6]**

609/06 • SB polymers, i.e. butadiene-styrene polymers **[6]**

**619/00 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]**

**621/00 Use of unspecified rubbers for preformed parts, e.g. for inserts [6]**

**623/00 Use of polyalkenes for preformed parts, e.g. for inserts [6]**

**625/00 Use of polymers of vinyl-aromatic compounds for preformed parts, e.g. for inserts [6]**

**627/00 Use of polyvinylhalogenides for preformed parts, e.g. for inserts [6]**

627/06 • PVC, i.e. polyvinylchloride **[6]**

627/12 • containing fluorine **[6]**

627/18 • • PTFE, i.e. polytetrafluoroethene **[6]**

**629/00 Use of polyvinylalcohols, polyvinylethers, polyvinylaldehydes, polyvinylketones or polyvinylketals for preformed parts, e.g. for inserts [6]**

**631/00 Use of polyvinylesters for preformed parts, e.g. for inserts [6]**

**633/00 Use of polymers of unsaturated acids or derivatives thereof, for preformed parts, e.g. for inserts** (B29K 635/00 takes precedence) **[6]**

633/04 • Polymers of esters **[6]**
633/18 • Polymers of nitriles **[6]**
633/20 • • PAN, i.e. polyacrylonitrile **[6]**

**635/00 Use of polymers of unsaturated polycarboxylic acids for preformed parts, e.g. for inserts [6]**

**645/00 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]**

**655/00 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 623/00-B29K 645/00, for preformed parts, e.g. for inserts [6]**

655/02 • ABS polymers, i.e. acrylonitrile-butadiene-styrene polymers **[6]**

**659/00 Use of polyacetals for preformed parts, e.g. for inserts [6]**

**661/00 Use of condensation polymers of aldehydes or ketones, for preformed parts, e.g. for inserts [6]**

661/04 • Phenoplasts **[6]**
661/20 • Aminoplasts **[6]**

**663/00 Use of epoxy resins for preformed parts, e.g. for inserts [6]**

**667/00 Use of polyesters for preformed parts, e.g. for inserts [6]**

**669/00 Use of polycarbonates for preformed parts, e.g. for inserts [6]**

**671/00 Use of polyethers for preformed parts, e.g. for inserts [6]**

**673/00 Use of other polymers having oxygen as the only hetero atom in the main chain, for preformed parts, e.g. for inserts [6]**

**675/00 Use of polyureas or polyurethanes for preformed parts, e.g. for inserts [6]**

**677/00 Use of polyamides, e.g. polyesteramides, for preformed parts, e.g. for inserts [6]**

**679/00 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]**

**681/00 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]**

**683/00 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]**

**685/00 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]**

**686/00 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]**

**691/00 Use of waxes for preformed parts, e.g. for inserts [6]**

**695/00 Use of bituminous materials for preformed parts, e.g. for inserts [6]**

**696/00 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]**

696/02 • Graft polymers **[6]**
696/04 • Block polymers **[6]**

**701/00 Use of unspecified macromolecular compounds for preformed parts, e.g. for inserts** (use of unspecified rubbers B29K 621/00) **[6]**

701/10 • Thermosetting resins **[6]**
701/12 • Thermoplastic materials **[6]**

**703/00 Use of resin-bonded materials for preformed parts, e.g. for inserts [6]**

703/04 • Inorganic materials **[6]**
703/06 • • Metal powders, metal carbides or the like **[6]**
703/08 • • Mineral aggregates, e.g. sand, clay or the like **[6]**

**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 or 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 or ivory **[6]**
711/08 • Leather **[6]**
711/10 • Natural fibres, e.g. wool or cotton **[6]**
711/12 • Paper, e.g. cardboard **[6]**
711/14 • Wood, e.g. woodboard or 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.

**1/00 Articles provided with screw threads [4]**

**5/00 Elements of slide fasteners [4]**

**7/00 Flat articles, e.g. films or sheets** (B29L 24/00 takes precedence) **[4]**

**9/00 Layered products [4]**

**11/00 Optical elements, e.g. lenses, prisms [4]**

**12/00 Frames [4]**

**15/00 Gear wheels or similar articles with grooves or projections, e.g. control knobs [4]**

**16/00 Articles with corrugations** (B29L 23/18 takes precedence) **[4]**

**17/00 Carriers of records containing fine grooves or impressions, e.g. disc records for needle playback, cylinder records [4]**

**19/00 Buttons or semi-finished parts of buttons [4]**

**21/00 Hair combs or similar toothed or slotted articles [4]**

**22/00 Hollow articles** (tubular articles B29L 23/00; pneumatic tyres B29L 30/00) **[4]**
22/02 • Inflatable articles (balls B29L 31/54) **[5]**

**23/00 Tubular articles** (B29L 24/00 takes precedence) **[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]**

**24/00 Articles with hollow walls [4]**

**25/00 Frameless domes [4]**

**28/00 Nets or the like [4]**

**29/00 Belts or bands [4]**

**30/00 Pneumatic or solid tyres or parts thereof** (inner tubes B29L 23/24) **[4]**

**31/00 Other particular articles [4]**
31/04 • Bearings **[4]**
31/06 • Rods, e.g. connecting rods **[4]**
31/08 • Blades for rotors, stators, fans, turbines or the like, e.g. screw propellers **[4]**
31/10 • Building elements, e.g. bricks, blocks, tiles, panels, posts, beams **[4]**
31/12 • Chains **[4]**
31/14 • Filters, sieves or screens **[4]**
31/16 • Frictional elements, e.g. brake or clutch linings **[4]**
31/18 • Heat-exchangers or parts thereof **[4]**
31/20 • Fuel-blocks, e.g. nuclear fuel elements **[4]**
31/22 • Hinges **[4]**
31/24 • Pipe joints or couplings (B29L 31/26 takes precedence) **[4]**
31/26 • Sealing devices, e.g. packaging for pistons or pipe joints **[4]**
31/28 • Tools, e.g. cutlery **[4]**
31/30 • Vehicles, e.g. ships or aircraft, or body parts thereof **[4]**
31/32 • Wheels, pinions, pulleys, castors or rollers **[4]**
31/34 • Electrical apparatus, e.g. sparking plugs or parts thereof **[4]**
31/36 • • Plugs, connectors, or parts thereof **[4]**
31/38 • Loudspeaker cones; Acoustic diaphragms **[4]**
31/40 • Test specimens **[4]**
31/42 • Brushes **[4]**
31/44 • Furniture or parts thereof **[4]**
31/46 • Knobs or handles **[4]**
31/48 • Wearing apparel **[4]**
31/50 • • Footwear, e.g. shoes or parts thereof **[4]**
31/52 • Sports equipment; Toys (B29L 31/54 takes precedence) **[4]**
31/54 • Balls **[4]**
31/56 • Stoppers or lids for bottles, jars, or the like **[4]**
31/58 • Upholstery or cushions, e.g. vehicle upholstery or interior padding **[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

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**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
9/28 • for forming shaped articles (from material in powder, granular, or paste form, e.g. briquetting presses, B30B 11/00)
9/30 • for baling; Compression boxes therefor (baling hay, straw, or the like A01F)
9/32 • for consolidating scrap metal or for compacting used cars

**11/00 Presses specially adapted for forming shaped articles from material in particulate or plastic state, e.g. briquetting presses, tabletting presses** (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)

11/02 • using a ram exerting pressure on the material in a moulding space
11/04 • • co-operating with a fixed mould
11/06 • • • each charge of the material being compressed against the previously formed body
11/08 • • co-operating with moulds carried by a turn-table
11/10 • • • intermittently rotated
11/12 • • co-operating with moulds on the circumference of a rotating drum
11/14 • • co-operating with moulds on a movable carrier other than a turn-table or a rotating drum
11/16 • using pocketed rollers, e.g. two co-operating pocketed rollers
11/18 • using profiled rollers
11/20 • Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring
11/22 • Extrusion presses; Dies therefor (extruding by the use of roller-and-ring machines B30B 11/20)
11/24 • • using screws or worms
11/26 • • using press rams
11/28 • • using perforated rollers or discs
11/30 • • using directly-acting fluid pressure
11/34 • for coating articles, e.g. tablets

**12/00 Presses not provided for in groups B30B 1/00-B30B 11/00 [2]**

**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]**

**15/00 Details of, or accessories for, presses; Auxiliary measures in connection with pressing** (safety devices F16P)
15/02 • Dies; Inserts therefor; Mountings thereof; Moulds (extrusion dies B30B 11/22)
15/04 • Frames; Guides
15/06 • Platens or press rams
15/08 • Accessory tools, e.g. knives; Mountings therefor
15/10 • Brakes specially adapted for presses
15/12 • Clutches specially adapted for presses
15/14 • Control arrangements for mechanically-driven presses
15/16 • Control arrangements for fluid-driven presses (pumps per se F04; hydraulic accumulators per se F15B; valves per se F16K)
15/18 • • controlling the reciprocating motion of the ram
15/20 • • • controlling the speed of the ram, e.g. the speed of the approach, pressing or return strokes
15/22 • • controlling the degree of pressure applied by the ram during the pressing stroke
15/24 • • controlling the movement of a plurality of actuating members to maintain parallel movement of the platen or press beam
15/26 • Programme control arrangements
15/28 • Arrangements for preventing distortion of, or damage to, presses or parts thereof
15/30 • Feeding material to presses
15/32 • Discharging presses
15/34 • Heating or cooling presses or parts thereof

## 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

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**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 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**
35/02 • and having means for feeding or positioning sheets or blanks
35/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
35/26 • and having means for folding sheets or blanks
35/60 • and having means for uniting opposed surfaces or edges, or for taping
35/74 • and having means for effecting auxiliary operations

**37/00** **Machinery characterised by making envelopes or bags with structural provision at the base for thickness of contents, from webs, e.g. from tubular webs** (machinery characterised by cutting sheets or blanks from webs and working them to form such envelopes or bags B31B 31/00)

37/02 • and having means for feeding or positioning webs
37/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
37/26 • and having means for folding webs
37/60 • and having means for uniting opposed surfaces or edges, or for taping
37/74 • and having means for effecting auxiliary operations

**39/00** **Machinery characterised by making lined envelopes or bags**

39/02 • and having means for feed or positioning sheets, blanks, or webs
39/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
39/26 • and having means for folding sheets, blanks or webs
39/60 • and having means for uniting opposed surfaces or edges, or for taping
39/74 • and having means for effecting auxiliary operations
39/84 • • Forming valves or applying valve inserts (connection of valves to inflatable elastic bodies B60C 29/00)

**41/00** **Machinery characterised by making envelopes or bags of other specific form or construction**

41/02 • and having means for feeding or positioning sheets, blanks, or webs
41/14 • and having means for cutting, e.g. perforating, punching, slitting, trimming
41/26 • and having means for folding sheets, blanks or webs
41/60 • and having means for uniting opposed surfaces or edges, or for taping
41/74 • and having means for effecting auxiliary operations

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**43/00** **Machinery characterised by making containers by shaping, otherwise than by folding, sheet material under pressure**

**45/00** **Machinery characterised by making containers having corrugated or pleated walls**

**47/00** **Hand tools for making envelopes, bags, boxes or cartons**

47/02 • for making envelopes or bags without preshaped bottoms
47/04 • for making envelopes or bags with preshaped bottoms

**49/00** **Machinery, accessories or processes not provided for in groups B31B 1/00-B31B 47/00** (forms or constructions of boxes, cartons, envelopes or bags B65D) **[2]**

**Note(s)**

Processes dependent on the use of specific machinery provided for in groups B31B 1/00-B31B 45/00 are classified in those groups.

49/02 • for making boxes or cartons
49/04 • for making envelopes or bags

**B31C** **MAKING WOUND ARTICLES, e.g. WOUND TUBES** (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

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**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
1/08 • Accessories of machines therefor not otherwise provided for

**3/00** **Forming paper tubes or pipes by feeding obliquely to the winding mandrel centre line**

3/02 • and inserting into a tube end a bottom to form a container
3/04 • Seam processing

**5/00** **Forming paper tubes or pipes without mandrels**

**7/00** **Forming conical paper articles by winding** (winding blanks B31B)

7/02 • Forming truncated cones
7/04 • • on two or more mandrels

7/06 • • • and inserting into a cone end a bottom to form a container
7/08 • Forming pointed cones
7/10 • • on two or more mandrels

**9/00 Simultaneous forming of cylindrical and conical shapes by winding separate webs, e.g. forming bottles** (winding blanks B31B)

**11/00 Paper-winding machinery combined with other machinery**
11/02 • for additionally shaping the articles
11/04 • for applying impregnating by coating-substances during the winding
11/06 • for drying the wound and impregnated articles

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

**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.

**1/00 Multiple-step processes for making flat articles**
1/02 • the articles being labels or tags (means or processes for attaching threads D05)
1/04 • the articles being napkins, handkerchiefs, towels, doilies, or the like
1/06 • the articles being handles

**3/00 Making articles of cellular structure, e.g. insulating board**
3/02 • honeycombed structures
3/04 • cellular packaging articles, e.g. for bottles

**5/00 Multiple-step processes for making three-dimensional articles** (assembly of garlands A41G 1/00; making receptacles or containers B31B; making tubes B31B, B31C)
5/02 • including pressing
5/04 • including folding or pleating, e.g. Chinese lanterns

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**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)

**1/00 Mechanical deformation of paper or cardboard without removing material including combined deformation and laminating** (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]**
1/07 • Embossing (corrugating B31F 1/20) **[3]**
1/08 • Creasing (corrugating B31F 1/20; zig-zag folding B65H 45/20) **[2]**
1/10 • • by rotary tools
1/12 • Crêping paper
1/14 • • by doctor blades arranged crosswise to the web
1/16 • • by elastic belts
1/18 • • by tools arranged in the direction of web feed
1/20 • Corrugating; Corrugating combined with laminating to other paper or cardboard layers (corrugating veneer B27D) **[2]**
1/22 • • Making webs in which the channel of each corrugation is longitudinal with the web feed
1/24 • • Making webs in which the channel of each corrugation is transverse to the web feed
1/26 • • • by interengaging toothed cylinders **[2]**
1/28 • • • • combined with uniting the corrugated webs to flat webs
1/29 • • • by making use of rods, e.g. co-operating with a toothed cylinder **[2]**
1/30 • • • Tools secured to endless chains
1/32 • • Corrugating already corrugated webs
1/36 • Moistening and heating webs to facilitate mechanical deformation and drying deformed webs

**5/00 Attaching together paper or cardboard sheets, strips, or webs; Reinforcing edges of paper or cardboard** (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 crimpling 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
MAKING LAYERED PRODUCTS
Methods or apparatus for laminating.....37/00
Ancillary operations.....38/00

Controlling or monitoring.....41/00
Other operations, e.g. repairing.....43/00

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**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 <u>in situ</u>
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, parchmentised
29/08 • Corrugated paper, corrugated cardboard **[3]**

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**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]**

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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]**
38/06 • Embossing **[2006.01]**
38/08 • Impregnating **[2006.01]**
38/10 • Removing layers, or parts of layers, mechanically or chemically (punching, slitting or perforating B32B 38/04) **[2006.01]**
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]**

**39/00 Layout of apparatus or plants, e.g. modular laminating systems [2006.01]**

**41/00 Arrangements for controlling or monitoring lamination processes; Safety arrangements [2006.01]**
41/02 • Safety arrangements **[2006.01]**

**43/00 Operations specially adapted for layered products and not otherwise provided for, e.g. repairing; Apparatus therefor [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

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**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

**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)
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

**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
9/12 • • Justifying devices
9/14 • • Supply devices for molten metal
9/16 • Devices for handling type after casting
9/18 • • Ejector mechanisms
9/20 • • Trimming devices

**11/00 Details of, or accessories for, machines for mechanical composition using matrices for individual characters which are selected and assembled for type casting or moulding**

11/02 • Matrices
11/04 • Space bands
11/06 • Storage devices for matrices or space bands
11/08 • • Magazines for 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 conveyors 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
11/76 • • • Pots (melting pots for casting stereotype plates B41D 3/20)
11/78 • • • • movable towards, and away from, mould
11/80 • • • • with stirrers or means for removing dross
11/82 • • • • associated with mechanisms for introducing metal in solid form
11/84 • • • • Throats or mouthpieces; Wipers for mouthpieces
11/86 • • • • Heaters for pots; Temperature-control devices
11/88 • • • Pumps; Stop-motions or safety devices therefor
11/90 • Arrangements or devices for distributing matrices or space bands after casting or moulding
11/92 • • Second elevators
11/94 • • Screw conveyors
11/96 • Devices for cooling or cleaning matrices

**<u>Photographic or photoelectronic composing devices</u>**

**13/00 Equipment specially adapted for photographing mounted characters or the like, e.g. advertisements, lines**

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

**15/00 Photographic composing machines with movable character carriers for composing lines of characters prior to photography**

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

**17/00 Photographic composing machines having fixed or movable character carriers and without means for composing lines prior to photography**

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 fount
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

**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
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

**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

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** **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**
11/02 • for securities (security printing B41M 3/14) **[3]**

**13/00** **Common details of rotary presses or machines**
13/004 • Electric or hydraulic features of drives **[6]**
13/008 • Mechanical features of drives, e.g. gears, clutches **[6]**
13/012 • • Taking-up backlash **[6]**
13/016 • Brakes **[6]**
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)
13/03 • • Threading webs into printing machines **[6]**
13/04 • • intermittently
13/06 • • Turning-bar arrangements
13/08 • Cylinders
13/10 • • Forme cylinders
13/11 • • • Gravure cylinders **[6]**
13/12 • • • Registering devices
13/14 • • • • with means for displacing the cylinders
13/16 • • • • with means for displacing the printing formes on the cylinders
13/18 • • Impression cylinders
13/187 • • • for rotogravure **[6]**
13/193 • • Transfer cylinders; Offset cylinders **[6]**
13/20 • • Supports for bearings or supports for forme, offset, or impression cylinders
13/21 • • • Bearer rings **[6]**
13/22 • • Means for cooling or heating forme or impression cylinders
13/24 • • Cylinder-tripping devices; Cylinder-impression adjustments
13/26 • • • Arrangement of cylinder bearings
13/28 • • • • Bearings mounted eccentrically of the cylinder axis
13/30 • • • • Bearings mounted on sliding supports
13/32 • • • • Bearings mounted on swinging supports
13/34 • • • Cylinder-lifting or -adjusting devices
13/36 • • • • Cams, eccentrics, wedges, or the like
13/38 • • • • electrically or magnetically operated
13/40 • • • • fluid-pressure operated
13/42 • • Guards or covers, e.g. for preventing ingress or egress of foreign matter
13/44 • Arrangements to accommodate interchangeable cylinders of different sizes to enable machine to print on areas of different sizes
13/46 • Printing units for inserting latest news
13/48 • Arrangements to enable printing to be effected over selected areas of a single forme cylinder (by inking selected areas B41F 31/18)
13/50 • • by effecting relative movement of forme and impression cylinders during printing cycle
13/52 • • by projecting and retracting parts of the surface of the forme cylinder
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)
13/56 • • Folding or cutting
13/58 • • • lengthwise
13/60 • • • crosswise
13/62 • • • Folding-cylinders or drums
13/64 • • Collecting
13/66 • • • and stapling
13/68 • • Adding inserts
13/70 • • Depositing

**15/00** **Screen printers** (for selective printing B41J 2/005)
15/02 • Manually-operable devices
15/04 • • for multicolour printing
15/06 • • with auxiliary equipment, e.g. for drying printed articles
15/08 • Machines
15/10 • • for multicolour printing
15/12 • • with auxiliary equipment, e.g. for drying printed articles
15/14 • Details
15/16 • • Printing tables
15/18 • • • Supports for workpieces
15/20 • • • • with suction-operated elements
15/22 • • • • for single sheets
15/24 • • • • for webs
15/26 • • • • for articles with flat surfaces
15/28 • • • • for elongated flat articles, e.g. strips, bands
15/30 • • • • for articles with curved surfaces
15/32 • • • • for articles with conical surfaces
15/34 • • Screens; Frames; Holders therefor
15/36 • • • flat
15/38 • • • curved
15/40 • • Inking units
15/42 • • • comprising squeegees or doctors
15/44 • • Squeegees or doctors (doctors of rotary intaglio printing presses B41F 9/10)
15/46 • • • with two or more operative parts

**16/00** **Transfer printing apparatus** (apparatus or machines for applying decalcomanias B65C) **[4]**
16/02 • for textile material **[4]**

**17/00** **Printing apparatus or machines of special types or for particular purposes, not otherwise provided for** (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)
17/02 • for printing books or manifolding sets
17/04 • for printing calendars
17/08 • for printing on filamentary or elongated articles or material, or on articles with cylindrical surfaces
17/10 • • on articles or material of indefinite length, e.g. wires, hoses, tubes or yarns
17/12 • • • at an angle to axis
17/13 • • • for printing on rolls of material, the roll serving as impression cylinder, e.g. strip printers **[2009.01]**
17/14 • • on articles of finite length
17/16 • • • on end or bottom surfaces thereof
17/18 • • • on curved surfaces of articles of varying cross-section, e.g. bottles, lamp glasses
17/20 • • • on articles of uniform cross-section, e.g. pencils, rulers, resistors
17/22 • • • • by rolling contact
17/24 • for printing on flat surfaces of polyhedral articles
17/26 • • by rolling contact
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 conveyors 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

33/10 • • for starting or stopping operation of damping or inking units
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
33/16 • Programming systems for automatic control of sequence of operations
33/18 • Web break detection (B41F 33/04 takes precedence) **[6]**

**35/00 Cleaning arrangements or devices**
35/02 • for forme cylinders
35/04 • for inking rollers
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 Apparatus for bronze printing or for like operations** (applying granular materials or metallic foils for decorative purposes B44C 1/00)
1/02 • platen type
1/04 • cylinder type

**3/00 Apparatus for printing lines**

**5/00 Apparatus for bordering or edging sheets or like articles, e.g. for producing black rims on mourning cards**

**7/00 Auxiliary perforating apparatus associated with printing devices** (apparatus or machines for carrying-out printing operations combined with operations other than perforating B41F 19/00)

**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)**

1. 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.
2. 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.
3. 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

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**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

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-rachet 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

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**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 manifolding, 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 manifolding, 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 conveyors 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

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 conveyors
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; conveyors 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**

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

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**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 (conveyors 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 CHARACTERISED BY IDENTIFICATION OR SECURITY FEATURES; PRINTED MATTER OF SPECIAL FORMAT OR STYLE NOT OTHERWISE PROVIDED FOR; DEVICES FOR USE THEREWITH AND NOT OTHERWISE PROVIDED FOR; MOVABLE-STRIP WRITING OR READING APPARATUS

**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

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**1/00** **Books or other bound products** (indexing features B42F 21/00)

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

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** **Sheets united without binding to form pads or blocks**

5/02 • Form sets

5/04 • Calendar blocks
5/06 • • Tear-off calendar blocks

**7/00 Newspapers or the like**

**9/00 Bookmarkers; Spot indicators; Devices for holding books open** (indexing tabs for sheets B42F 21/00)**; Leaf turners [2]**
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 Carrying forward or transferring entries from one page to another, e.g. for book-keeping**

**12/00 Book-keeping books, forms, or arrangements** (B42D 11/00 takes precedence) **[2]**
12/02 • Book-keeping forms **[2]**

**13/00 Loose leaves modified for binding; Inserts** (indexing features B42F 21/00)

**15/00 Printed matter of special format or style not otherwise provided for**
15/02 • Postcards; Greeting, menu, business or like cards; Letter cards or letter-sheets (B42D 25/00 takes precedence)
15/04 • • Foldable or multi-part cards or sheets
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]**

**17/00 Hanging or securing devices for books, newspapers, or the like** (suspended filing appliances B42F 15/00) **[2]**

**19/00 Movable-strip writing or reading apparatus**

***25/00 Information-bearing cards or sheet-like structures characterised by identification or security features; Manufacture thereof*** *(printing processes to produce identification or security features B41M 3/14)* ***[2014.01]***
*25/20 • characterised by a particular use or purpose* ***[2014.01]***
*25/21 • • for multiple purposes* ***[2014.01]***
*25/22 • • for use in combination with accessories specially adapted for information-bearing cards* ***[2014.01]***
*25/23 • • Identity cards* ***[2014.01]***
*25/24 • • Passports* ***[2014.01]***
*25/25 • • Public transport tickets (apparatus for printing and issuing G07B)* ***[2014.01]***
*25/26 • • Entrance cards; Admission tickets* ***[2014.01]***
*25/27 • • Lots, e.g. lottery tickets* ***[2014.01]***
*25/28 • • for use in medical treatment or therapy* ***[2014.01]***
*25/29 • • Securities; Bank notes* ***[2014.01]***
*25/30 • Identification or security features, e.g. for preventing forgery* ***[2014.01]***
*25/305 • • Associated digital information (record carriers for use with machines and with at least a part designed to carry digital markings G06K 19/00)* ***[2014.01]***
*25/309 • • Photographs* ***[2014.01]***
*25/313 • • Fingerprints* ***[2014.01]***
*25/318 • • Signatures* ***[2014.01]***
*25/324 • • Reliefs* ***[2014.01]***
*25/328 • • Diffraction gratings; Holograms* ***[2014.01]***
*25/333 • • Watermarks* ***[2014.01]***
*25/337 • • Guilloche patterns* ***[2014.01]***
*25/342 • • Moiré effects* ***[2014.01]***
*25/346 • • Perforations* ***[2014.01]***
*25/351 • • Translucent or partly translucent parts, e.g. windows* ***[2014.01]***
*25/355 • • Security threads* ***[2014.01]***
*25/36 • • comprising special materials* ***[2014.01]***
*25/364 • • • Liquid crystals* ***[2014.01]***
*25/369 • • • Magnetised or magnetisable materials* ***[2014.01]***
*25/373 • • • Metallic materials* ***[2014.01]***
*25/378 • • • Special inks* ***[2014.01]***
*25/382 • • • • absorbing or reflecting infra-red light* ***[2014.01]***
*25/387 • • • • absorbing or reflecting ultra-violet light* ***[2014.01]***
*25/391 • • • • absorbing or reflecting polarised light* ***[2014.01]***
*25/40 • Manufacture* ***[2014.01]***
*25/405 • • Marking* ***[2014.01]***
*25/41 • • • using electromagnetic radiation (B42D 25/435 takes precedence)* ***[2014.01]***
*25/415 • • • using chemicals (B42D 25/445 takes precedence)* ***[2014.01]***
*25/42 • • • • by photographic processes* ***[2014.01]***
*25/425 • • • by deformation, e.g. embossing* ***[2014.01]***
*25/43 • • • by removal of material* ***[2014.01]***
*25/435 • • • • using electromagnetic radiation, e.g. laser* ***[2014.01]***
*25/44 • • • • using mechanical means, e.g. engraving* ***[2014.01]***
*25/445 • • • • using chemical means, e.g. etching* ***[2014.01]***
*25/45 • • Associating two or more layers* ***[2014.01]***
*25/455 • • • using heat* ***[2014.01]***
*25/46 • • • using pressure* ***[2014.01]***
*25/465 • • • using chemicals or adhesives* ***[2014.01]***
*25/47 • • • • using adhesives* ***[2014.01]***
*25/475 • • Cutting cards* ***[2014.01]***
*25/48 • • Controlling the manufacturing process* ***[2014.01]***
*25/485 • • • by electronic processing means* ***[2014.01]***

**B42F SHEETS TEMPORARILY ATTACHED TOGETHER; FILING APPLIANCES; FILE CARDS; INDEXING** (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

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**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 gussetted pockets
7/04 • Covers with retention means
7/06 • Portfolios or cases with a plurality of compartments (indexing features B42F 21/00)
7/08 • • expansible
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 • Expansible 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
21/04 • Tabs permanently fastened to sheets, papers, cards, or suspension files
21/06 • Tabs detachably mounted on sheets, papers, cards, or suspension files
21/08 • • in one of a number of predetermined positions
21/10 • • • represented by slits
21/12 • Sheets, papers, or cards having edges cut away to facilitate indexing, e.g. thumb cuts on books

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**23/00** **Filing appliances not provided for in other groups of this subclass [2006.01]**

## 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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**1/00** **Nibs** (continuously-adjustable nibs B43K 17/00)**; Writing- points** (for indicating or recording apparatus G01D 15/16) **[2]**
1/01 • with ink reservoirs, e.g. funnel-shaped **[6]**
1/02 • Split nibs
1/04 • • with broadened tips
1/06 • Tubular writing-points
1/08 • with ball points; Balls or ball beds
1/10 • Wire nibs
1/12 • Writing-points comprising fibres; Felt pads

**3/00** **Nib holders** (holders for continuously-adjustable nibs B43K 17/00)
3/02 • with ink guards
3/04 • with retractable nibs (mechanisms for retracting or locking nibs B43K 24/00)

**5/00** **Pens with ink reservoirs in holders, e.g. fountain-pens** (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)
5/02 • Ink reservoirs
5/03 • • specially adapted for concentrated ink, e.g. solid ink **[6]**
5/04 • • flexible
5/06 • • with movable pistons
5/08 • • • with ink-supplying valves

5/10 • • with reserve ink chambers
5/12 • • with ink-level inspection means
5/14 • • Exchangeable ink cartridges
5/16 • with retractable nibs (mechanisms for retracting or locking nibs B43K 24/00)
5/17 • • with closing means **[6]**
5/18 • Arrangements for feeding the ink to the nibs

**7/00** **Ball-point pens** (multiple-point writing implements B43K 27/00)
7/01 • for low viscosity liquid ink **[6]**
7/02 • Ink reservoirs; Ink cartridges (B43K 7/01 takes precedence) **[6]**
7/03 • • pressurised, e.g. by gas **[5]**
7/035 • • • the gas acting on a piston **[6]**
7/04 • • Arrangements for refilling the reservoirs, e.g. arrangements at the ball-point ends
7/06 • • Reservoirs with ink-level inspection means
7/08 • • Preventing leakage
7/10 • Arrangements for feeding the ink to the ball points (B43K 7/01 takes precedence) **[6]**
7/12 • with retractable ball points (mechanisms for retracting or locking ball points B43K 24/00)

**8/00** **Pens with writing-points other than nibs or balls** (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

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**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 templets 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
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 templets 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 templets 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 templets
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

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**1/00** **Fixing seals on documents** (embossing dies B44B; seals per se G09F 3/00)
1/02 • Sealing-wax holders

**3/00** **Devices for inserting documents into envelopes** (combined devices for inserting documents into, and closing, envelopes B43M 5/00)
3/02 • equipped with document-folding means (B43M 3/04 takes precedence)
3/04 • automatic

**5/00** **Devices for closing envelopes**
5/02 • Hand devices for both moistening gummed flaps of envelopes and for closing the envelopes
5/04 • automatic

**7/00** **Devices for opening envelopes** (cutting tools in general B26)
7/02 • Devices for both opening envelopes and removing contents

**9/00** **Paper-weights**

**11/00** **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** (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)
11/02 • with rollers
11/04 • with pads (B43M 11/06 takes precedence)
11/06 • Hand-held devices
11/08 • • of the fountain-pen type

**13/00** **Dispensers without mechanisms for single stamps modified for the application of stamps to articles** (manually-controlled or manually-operable label or stamp dispensers B65C 11/00)

**15/00** **Drawing-pins; Thumb-tacks** (extractors B25C 11/00)

**99/00** **Subject matter not provided for in other groups of this subclass [2010.01]**

## 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 OR INLAYING** (ornamenting 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

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**1/00** **Artists' machines or apparatus equipped with tools or work holders moving, or able to be controlled, three-dimensionally for making single sculptures or models** (copying devices for machine-tool use B23Q 35/00)
1/02 • wherein three-dimensional copies are made
1/04 • • having devices for changing, e.g. proportionally enlarging or reducing, the shape from an original pattern
1/06 • Accessories

**3/00** **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** (marking or engraving metal by the action of a high concentration of electric current B23H 9/06; forme engraving B41C 1/02; engraving by photomechanical reproduction G03F 7/20)

3/02 • wherein plane surfaces are worked

3/04 • wherein non-plane surfaces are worked

3/06 • Accessories, e.g. tool or work holders

**5/00** **Machines or apparatus for embossing decorations or marks, e.g. embossing coins** (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 59/02; embossing of paper or cardboard in general B31F 1/07; forme embossing B41C 1/08; printing machines for carrying out printing operations combined with embossing B41F 19/02; typewriters or selective printing or marking mechanisms adapted for embossing B41J 3/38; intaglio stamping devices or apparatus B41K 1/30, B41K 3/16; stamping apparatus with means for deforming the copy matter B41K 3/36; embossing leather C14B 1/56)

5/02 • Dies; Accessories

**7/00** **Machines, apparatus, or hand tools for branding**

7/02 • Branding irons

**9/00** **Machines or apparatus for inlaying with ornamental structures, e.g. tarsia or mosaic work**

**11/00** **Artists' hand tools for sculpturing, kneading, carving, engraving, guilloching, or embossing; Accessories therefor**

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
1/14 • • Iridescent effects

**3/00 Designs characterised by outlines**

**5/00 Designs characterised by irregular areas, e.g. mottled patterns**

**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

**99/00 Subject matter not provided for in other groups of this subclass [2013.01]**

# 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

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**Wheels**

**1/00 Spoked wheels; Spokes thereof** (non-metallic B60B 5/00) **[2]**

1/02 • Wheels with wire or other tension spokes

1/04 • • Attaching spokes to rim or hub

1/06 • Wheels with compression spokes (wheels of high resiliency B60B 9/00)

1/08 • • formed by casting

1/10 • • fabricated from sheet metal (B60B 1/12, B60B 3/08 take precedence)

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)

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]**

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**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)**

1. 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.
2. 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

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**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 resistence (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** **Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles** (measuring in general G01, e.g. G01L 17/00; remote signalling in general G08)**; Arrangement of tyre inflating devices on vehicles, e.g. of pumps, of tanks** (air pumps per se F04; tanks per se F17C)**; Tyre cooling arrangements [3]**

23/02 • Signalling devices actuated by tyre pressure
23/04 • • mounted on the wheel or tyre
23/06 • Signalling devices actuated by deformation of the tyre (wear-indicating arrangements B60C 11/24)
23/08 • • by touching the ground
23/10 • Arrangement of tyre-inflating pumps mounted on vehicles
23/12 • • operated by a running wheel
23/14 • • operated by the prime mover of the vehicle
23/16 • Arrangement of air tanks mounted on vehicles
23/18 • Tyre cooling arrangements **[3, 4]**
23/19 • • for dissipating heat **[4]**
23/20 • Devices for measuring or signalling tyre temperature **[3]**

**25/00** **Apparatus or tools adapted for mounting, removing or inspecting tyres** (apparatus or tools characterised by the means for holding wheels or parts thereof B60B 30/00) **[5]**

25/01 • for removing tyres from, or mounting tyres on, wheels **[5]**
25/02 • • Tyre levers or the like, e.g. hand-held (machine operated B60C 25/05) **[5]**
25/04 • • • pivotal about the wheel axis, or movable along the rim edge, e.g. rollable **[5]**
25/05 • • Machines **[5]**
25/12 • • • for only seating the beads **[5]**
25/122 • • • • acting on the tyre tread **[5]**
25/125 • • • for only breaking the beads **[5]**
25/128 • • • • acting axially on the whole circumference of the bead or side wall **[5]**
25/13 • • • • acting axially at localised regions of the bead or side wall **[5]**
25/132 • • • for removing and mounting tyres (for only seating the beads B60C 25/12; for only breaking the beads B60C 25/125) **[5]**
25/135 • • • • having a tyre support or a tool, movable along wheel axis **[5]**
25/138 • • • • • with rotary motion of tool or tyre support **[5]**
25/14 • Apparatus or tools for spreading tyre beads (B60C 25/12 takes precedence) **[5]**
25/15 • • with means for inverting the tyre **[5]**
25/18 • Tools for mounting or demounting air valves
25/20 • Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims

**27/00** **Non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels**

27/02 • extending over restricted arcuate part of tread (B60C 27/20 takes precedence)
27/04 • • the ground-engaging part being rigid
27/06 • extending over the complete circumference of tread, e.g. made of chains (B60C 27/20 takes precedence)
27/08 • • involving lugs or rings taking up wear
27/10 • • having tensioning means
27/12 • • • resilient
27/14 • • automatically attachable
27/16 • • formed of close material, e.g. leather
27/18 • • • the material being fabric, e.g. woven wire
27/20 • having ground-engaging plate-like elements
27/22 • for tandem tyres (endless-track features B62D)

**29/00** **Arrangements of tyre-inflating valves to tyres or rims; Accessories for tyre-inflating valves, not otherwise provided for** (tools for mounting or demounting valves B60C 25/18; valves per se, valve dust caps F16K) **[4, 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]**

**99/00** **Subject matter not provided for in other groups of this subclass [2006.01]**

**B60D** **VEHICLE CONNECTIONS** (components of brake systems B60T 17/04)

**Note(s)**

Attention is drawn to the Note following the title of class B60.

**1/00** **Traction couplings; Hitches; Draw-gear; Towing devices** (devices specially adapted for connection between tractors and agricultural machines or implements A01B 59/00; fifth-wheel couplings B62D) **[2]**

1/01 • Traction couplings or hitches characterised by their type **[5]**
1/02 • • Bolt or shackle-type couplings **[5]**
1/04 • • Hook or hook-and-hasp couplings **[5]**
1/06 • • Ball-and-socket hitches **[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]**
1/14 • Draw-gear or towing devices characterised by their type **[4]**
1/145 • • consisting of an elongated single bar or tube **[5]**
1/155 • • • comprising telescopic or foldable parts **[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]**
1/173 • • consisting of at least two bars which are not connected or articulated to each other **[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]**

1/30 • • for sway control **[5]**
1/32 • • • involving damping devices **[5]**
1/34 • • • involving springs **[5]**
1/36 • • for facilitating connection, e.g. hitch catchers **[5]**
1/38 • • • involving auxiliary cables for drawing the trailer to the tractor before coupling **[5]**
1/40 • • • involving a temporarily extensible or alignable member (B60D 1/38 takes precedence) **[5]**
1/42 • • for being adjustable **[5]**
1/44 • • • horizontally **[5]**
1/46 • • • vertically **[5]**
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]**
1/56 • • securing to the vehicle bumper **[5]**
1/58 • Auxiliary devices **[5]**
1/60 • • Covers, caps or guards **[5]**
1/62 • • involving supply lines, electric circuits, or the like **[5]**
1/64 • • • Couplings or joints therefor **[5]**
1/66 • • Props **[5]**

**3/00** **Fittings to facilitate pushing** (B60D 1/00 takes precedence; vehicle bumpers B60R 19/02; steering arrangements for backing a normally-drawn trailer B62D 13/06)

**5/00** **Gangways for coupled vehicles, e.g. of concertina type**

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

**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** **Vehicles for use both on rail and on road; Conversions therefor**
1/02 • with rail and road wheels on the same axle
1/04 • with rail and road wheels on different axles

**3/00** **Amphibious vehicles, i.e. vehicles capable of travelling both on land and on water; Land vehicles capable of travelling under water** (buoyant wheels B60B)

**5/00** **Other vehicles capable of travelling in or on different media** (vehicles having alternatively-usable runners and wheels B62B 13/18; flying-boats or seaplanes B64C 35/00)
5/02 • convertible into aircraft

**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

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**1/00** **Suspensions with rigid connection between axle and frame**
1/02 • with continuous axle
1/04 • with divided axle

**3/00** **Resilient suspensions for a single wheel** (pivoted suspension arms per se, 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)
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

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]**

7/20 • Vehicle storage compartments for roof parts
7/22 • Wind deflectors for open roofs

**9/00 Devices not provided for in one of main groups B60J 1/00-B60J 7/00** (B60J 10/00 takes precedence) **[3, 5]**

9/02 • Entrance or exit closures other than windows, doors, or in roofs, e.g. emergency escape closures in vehicle bottom
9/04 • Air curtains (in general F24F)

**10/00 Sealing arrangements** (sealings in general F16J 15/00) **[5]**

10/02 • for windows or windscreens **[5]**
10/04 • • for sliding window panes, e.g. sash guides **[5]**
10/06 • • • for flush-glass windows **[5]**
10/08 • for doors **[5]**
10/10 • for non-fixed roofs **[5]**
10/12 • for movable panels in roofs **[5]**

**11/00 Removable external protective coverings specially adapted for vehicles or parts of vehicles, e.g. parking covers** (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) **[1, 2006.01]**

**Note(s) [2006.01]**

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.

11/02 • Covers wound on rollers **[2006.01]**
11/04 • for covering at least the roof of the vehicle, e.g. for covering the whole vehicle **[2006.01]**
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) **[2006.01]**
11/08 • • for windows or windscreens (antiglare equipment B60J 3/00) **[2006.01]**
11/10 • • for wheels (hub caps or the like B60B 7/00; external spare wheel stowing, holding or mounting arrangements B62D 43/02) **[2006.01]**

## 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)**

1. 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.
2. 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** **Arrangement or mounting of control devices for vehicle transmissions, or parts thereof, not otherwise provided for** (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 per se 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

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**25/00** **Auxiliary drives** (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** **Arrangement or mounting of propulsion-unit control devices in vehicles** (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** **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** (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** **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** (fittings acting on two or more sub-units B60W 30/14; propulsion-unit control in general, see the relevant classes or subclasses, e.g. F02D; speedometers G01P; systems or devices for controlling speed in general G05D 13/00) **[2, 2006.01]**

**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** **Arrangement or adaptations of instruments** (arrangements on dashboard B60K 37/02)

**37/00** **Dashboards** (as road-vehicle superstructure sub-unit B62D)
37/02 • Arrangement of instruments (arrangement of lighting devices for dashboards B60Q 3/04)
37/04 • Arrangement of fittings on dashboard (of instruments B60K 37/02)
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

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**1/00** **Supplying electric power to auxiliary equipment of electrically-propelled vehicles** (arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q) **[6]**
1/02 • to electric heating circuits
1/04 • • fed by the power supply line
1/06 • • • using only one supply
1/08 • • • • Methods or devices for control or regulation
1/10 • • • with provision for using different supplies
1/12 • • • • Methods or devices for control or regulation
1/14 • to electric lighting circuits
1/16 • • fed by the power supply line

**3/00** **Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption**
3/02 • Dead-man's devices
3/04 • Cutting-off the power supply under fault conditions
3/06 • Limiting the traction current under mechanical-overload conditions
3/08 • Means for preventing excessive speed of the vehicle
3/10 • Indicating wheel slip
3/12 • Recording operating variables

**5/00** **Current-collectors for power supply lines of electrically-propelled vehicles**
5/02 • with ice-removing device
5/04 • using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)
5/06 • • Structure of the rollers or their carrying means
5/08 • • Structure of the sliding shoes or their carrying means
5/10 • • Devices preventing the collector from jumping off
5/12 • • Structural features of poles or their bases
5/14 • • • Devices for automatic lowering of a jumped-off collector
5/16 • • • Devices for lifting and resetting the collector (B60L 5/34 takes precedence)
5/18 • using bow-type collectors in contact with trolley wire
5/19 • • using arrangements for effecting collector movement transverse to the direction of vehicle motion **[3]**
5/20 • • Details of contact bow
5/22 • • Supporting means for the contact bow
5/24 • • • Pantographs
5/26 • • • Half-pantographs, e.g. using counter-rocking beams
5/28 • • • Devices for lifting and resetting the collector
5/30 • • • • using springs
5/32 • • • • using fluid pressure
5/34 • with devices to enable one vehicle to pass another one using the same power supply line
5/36 • with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
5/38 • for collecting current from conductor rails (B60L 5/40 takes precedence)
5/39 • • from third rail **[3]**
5/40 • for collecting current from lines in slotted conduits
5/42 • for collecting current from individual contact pieces connected to the power supply line

**7/00** **Electrodynamic brake systems for vehicles in general [4]**
7/02 • Dynamic electric resistor braking (B60L 7/22 takes precedence)
7/04 • • for vehicles propelled by dc motors
7/06 • • for vehicles propelled by ac motors
7/08 • • Controlling the braking effect (B60L 7/04, B60L 7/06 take precedence)
7/10 • Dynamic electric regenerative braking (B60L 7/22 takes precedence)
7/12 • • for vehicles propelled by dc motors

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 transductor
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 transductor
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)

**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.

**1/00** **Power supply lines for contact with collector on vehicle** (collectors therefor B60L 5/00)
1/02 • Details
1/04 • • Mechanical protection of line; Protection against contact by living beings
1/06 • • Arrangements along the power lines for reducing interference in nearby communication lines (in general H04B 15/02)
1/08 • • Arrangements for energising and de-energising power line sections using mechanical actuation by the passing vehicle
1/10 • • Arrangements for energising and de-energising power line sections using magnetic actuation by the passing vehicle
1/12 • Trolley lines; Accessories therefor
1/13 • • Trolley wires
1/14 • • Crossings; Points
1/16 • • Suspension insulators (in general H01B)
1/18 • • Section insulators; Section switches
1/20 • • Arrangements for supporting or suspending trolley wires, e.g. from buildings
1/22 • • • Separate lines from which power lines are suspended, e.g. catenary lines, supporting-lines under tension
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
1/26 • • Compensation means for variation in length
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)
1/30 • Power rails
1/32 • • Crossings; Points (B60M 1/34 takes precedence)
1/34 • • in slotted conduits
1/36 • Single contact pieces along the line for power supply

**3/00** **Feeding power to the supply lines in contact with collector on vehicles; Arrangements for consuming regenerative power** (controlling rail vehicles by varying voltage of power fed to vehicle B60L; power distribution in general H02J)
3/02 • with means for maintaining voltage within a predetermined range (in general G05F)
3/04 • Arrangements for cutting-in and -out of individual track sections (by passage of the vehicle B60M 1/10)
3/06 • Arrangements for consuming regenerative power

**5/00** **Arrangements along running rails or at joints thereof for current-conduction or insulation, e.g. safety devices for reducing earth currents** (insulating rail joints E01B 11/54; conductive connections between rails in general H01R 4/00, e.g. H01R 4/64)
5/02 • Means for reducing potential difference between rail and adjacent ground

**7/00** **Power lines or rails specially adapted for electrically-propelled vehicles of special types, e.g. suspension tramway, ropeway, underground railway**

**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.

**2/00** **Seats specially adapted for vehicles; Arrangement or mounting of seats in vehicles** (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]**
2/005 • Arrangement or mounting of seats in vehicles (B60N 2/02 takes precedence) **[7]**
2/01 • • Arrangement of seats relative to one another **[7]**
2/015 • • Attaching seats directly to vehicle chassis **[7]**
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]**
2/04 • • the whole seat being movable **[5]**
2/06 • • • slidable (B60N 2/12 takes precedence) **[5]**
2/07 • • • • Slide construction **[7]**
2/075 • • • • • roller-less **[7]**
2/08 • • • • characterised by the locking device **[5]**
2/10 • • • tiltable (B60N 2/12 takes precedence) **[5]**
2/12 • • • slidable and tiltable **[5]**
2/14 • • • rotatable, e.g. to permit easy access (B60N 2/10 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 conveyors 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

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**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

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

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**1/00 Optical viewing arrangements** (antiglare equipment, e.g. polarising, for windscreens or windows B60J 3/00) **[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 25/22)
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 43/06)
5/02 • arranged at front of vehicle
5/04 • arranged at rear of vehicle

**7/00 Stowing or holding appliances inside of vehicle primarily intended for personal property smaller than suit-cases, e.g. travelling articles, or maps** (for radio sets, television sets, telephones, or the like, mounting of cameras operative during drive, tools, or spare parts B60R 11/02-B60R 11/06; for receptacles for refuse, food, beverages, cigarettes B60N 3/00)

7/02 • in a separate luggage compartment
7/04 • in driver or passenger space
7/05 • • mounted on sun visor **[5]**
7/06 • • mounted on or below dashboards
7/08 • Disposition of racks, clips, or the like
7/10 • • for supporting hats, clothes or clothes hangers **[5]**
7/12 • • for supporting umbrellas **[5]**
7/14 • • for supporting weapons **[5]**

**9/00 Supplementary fittings on vehicle exterior for carrying loads, e.g. luggage, sports gear or the like [5]**

9/02 • at the sides, e.g. on running-board
9/04 • Carriers associated with vehicle roof (B60R 9/08 takes precedence) **[5]**
9/042 • • Carriers characterised by means to facilitate loading or unloading of the load, e.g. rollers, tracks, or the like **[5]**
9/045 • • Carriers being adjustable or transformable, e.g. expansible, collapsible **[5]**
9/048 • • Carriers characterised by article-gripping, -retaining, or -locking means **[5]**
9/05 • • Carriers characterised by wind deflecting means **[5]**
9/052 • • Carriers comprising elongate members extending only transversely of vehicle (B60R 9/08 takes precedence) **[5]**
9/055 • • Enclosure-type carriers, e.g. containers, boxes (B60R 9/048 takes precedence) **[5]**
9/058 • • characterised by releasable attaching means between carrier and roof **[5]**
9/06 • at vehicle front or rear
9/08 • specially adapted for sports gear
9/10 • • for cycles
9/12 • • for skis

**11/00 Arrangements for holding or mounting articles, not otherwise provided for**

11/02 • for radio sets, television sets, telephones, or the like; Arrangement of controls thereof
11/04 • Mounting of cameras operative during drive; Arrangement of controls thereof relative to the vehicle
11/06 • for tools or spare parts (for spare wheels B62D 43/00)

**13/00 Elements for body-finishing, identifying, or decorating; Arrangements or adaptations for advertising purposes**

13/01 • Liners for load platforms or load compartments **[5]**
13/02 • Trim mouldings; Ledges; Wall liners; Roof liners (B60R 13/01 takes precedence) **[5]**
13/04 • Ornamental or guard strips; Ornamental inscriptive devices
13/06 • Sealing strips
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]**
13/08 • Insulating elements, e.g. for sound insulation **[4]**
13/10 • Registration, licensing, or like devices

**15/00 Arrangements or adaptations of sanitation devices**

15/02 • Washing facilities
15/04 • Toilet facilities

**16/00 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]**

16/02 • electric **[3]**
16/023 • • for transmission of signals between vehicle parts or subsystems **[2006.01]**
16/027 • • • between relatively movable parts of the vehicle, e.g. between steering wheel and column **[2006.01]**
16/03 • • for supply of electrical power to vehicle subsystems **[2006.01]**
16/033 • • • characterised by the use of electrical cells or batteries **[2006.01]**
16/037 • • for occupant comfort **[2006.01]**
16/04 • • Arrangement of batteries **[3, 6, 2006.01]**
16/06 • • for carrying-off electrostatic charges **[3]**
16/08 • fluid **[3]**

**17/00 Arrangements or adaptations of lubricating systems or devices**

17/02 • Systems, e.g. central lubrication systems

**19/00 Wheel guards; Radiator guards; Obstruction removers; Fittings damping bouncing force in collisions** (mudguards B62D 25/16)

19/02 • Bumpers, i.e. impact receiving or absorbing members for protecting vehicles or fending off blows from other vehicles or objects (integral with waterborne vessels or specially adapted therefor B63B 59/02) **[4]**
19/03 • • characterised by material, e.g. composite (B60R 19/18 takes precedence) **[4]**
19/04 • • formed from more than one section (B60R 19/18 takes precedence) **[4]**
19/12 • • • vertically spaced **[4]**
19/14 • • • having folding parts **[4]**
19/16 • • • having deflecting members, e.g. rollers, balls **[4]**
19/18 • • Means within the bumper to absorb impact **[4]**
19/20 • • • containing gas or liquid, e.g. inflatable **[4]**
19/22 • • • containing cellular material, e.g. solid foam **[4]**
19/24 • • Arrangements for mounting bumpers on vehicles **[4]**
19/26 • • • comprising yieldable mounting means **[4]**
19/28 • • • • Metallic springs **[4]**
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 **[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; 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) **[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 **[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 **[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 **[4, 7]**
21/16 • • Inflatable occupant restraints or confinements designed to inflate upon impact or impending impact, e.g. air bags **[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 **[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 [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 **[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 **[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 **[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 **[4, 7]**
22/48 • Control systems, alarms, or interlock systems, for the correct application of the belt or harness **[4]**

**25/00 Fittings or systems for preventing or indicating unauthorised use or theft of vehicles** (locks for vehicles E05B 77/00-E05B 85/00) **[5, 2013.01]**
25/01 • operating on vehicle systems or fittings, e.g. on doors, seats or windscreens **[2013.01]**
25/02 • • operating on the steering mechanism **[1, 2013.01]**
25/021 • • • restraining movement of the steering column or steering wheel hub, e.g. restraining means controlled by ignition switch **[2013.01]**
25/0215 • • • • using electric means, e.g. electric motors or solenoids **[2013.01]**
25/022 • • • operating on the steering wheel, e.g. bars locked to the steering wheel rim (B60R 25/021 takes precedence) **[2013.01]**
25/023 • • • Countermeasures against the physical destruction of the steering lock **[2013.01]**
25/04 • • operating on the propulsion system, e.g. engine or drive motor **[1, 2013.01]**
25/042 • • • operating on the fuel supply **[2013.01]**
25/043 • • • by blocking the exhaust **[2013.01]**
25/044 • • • by limiting or blocking the air supply **[2013.01]**
25/045 • • • by limiting or cutting the electrical supply to the propulsion unit **[2013.01]**
25/06 • • • operating on the vehicle transmission
25/08 • • operating on brakes or brake systems
25/09 • • by restraining wheel rotation, e.g. wheel clamps **[2013.01]**
25/10 • actuating a signalling device **[1, 2013.01]**
25/102 • • a signal being sent to a remote location, e.g. a radio signal being transmitted to a police station, a security company or the owner **[2013.01]**
25/104 • • characterised by the type of theft warning signal, e.g. visual or audible signals with special characteristics **[2013.01]**
25/20 • Means to switch the anti-theft system on or off **[2013.01]**
25/21 • • using hidden switches **[2013.01]**
25/22 • • using mechanical identifiers **[2013.01]**
25/23 • • using manual input of alphanumerical codes **[2013.01]**
25/24 • • using electronic identifiers containing a code not memorised by the user **[2013.01]**

25/25 • • using biometry **[2013.01]**
25/30 • Detection related to theft or to other events relevant to anti-theft systems **[2013.01]**
25/31 • • of human presence inside or outside the vehicle **[2013.01]**
25/32 • • of vehicle dynamic parameters, e.g. speed or acceleration **[2013.01]**
25/33 • • of global position, e.g. by providing GPS coordinates **[2013.01]**
25/34 • • of conditions of vehicle components, e.g. of windows, door locks or gear selectors **[2013.01]**
25/40 • Features of the power supply for the anti-theft system, e.g. anti-theft batteries, back-up power supply or means to save battery power **[2013.01]**

**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

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**1/00 Cleaning of vehicles** (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)
1/02 • Cleaning windscreens, windows, or optical devices
1/04 • • Wipers or the like, e.g. scrapers
1/06 • • • characterised by the drive (producing other than swinging movement B60S 1/44)
1/08 • • • • electrically driven
1/10 • • • • pneumatically driven
1/12 • • • • hydraulically driven
1/14 • • • • personally driven
1/16 • • • • Means for transmitting drive
1/18 • • • • • mechanically
1/20 • • • • • • by cable drives; by flexible shafts
1/22 • • • • • • by rotary cams
1/24 • • • • • • by rotary cranks
1/26 • • • • • • by toothed gearing
1/28 • • • characterised by a plurality of wipers (B60S 1/06 takes precedence)
1/30 • • • • arranged both outside and inside
1/32 • • • characterised by constructional features of wiper blades or arms
1/34 • • • • Wiper arms; Mountings therefor
1/36 • • • • • Variable-length arms
1/38 • • • • Wiper blades
1/40 • • • • Connections between blades and arms
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 per se 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

**3/00 Vehicle cleaning apparatus not integral with vehicles** (cleaning in general B08B; cleaning peculiar to waterborne vessels B63B 57/00, B63B 59/00; ground equipment for cleaning aircraft B64F 5/00)
3/04 • for exteriors of land vehicles
3/06 • • with rotary bodies contacting the vehicles

**5/00 Servicing, maintaining, repairing, or refitting of vehicles** (vehicles adapted to carry a workshop for servicing or maintenance B60P 3/14; servicing rail locomotives B61K)
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)
5/04 • Supplying air for tyre inflation (arrangement of tyre inflating devices on vehicles B60C 23/00; tyre pressure gauges G01L 17/00) **[3]**
5/06 • Supplying batteries to, or removing batteries from, vehicles (circuit arrangements for charging batteries H02J 7/00) **[6]**

**9/00 Ground-engaging vehicle fittings for supporting, lifting, or manoeuvring the vehicle, wholly or in part, e.g. built-in jacks** (lifting devices in general B66F; supports in general F16M)
9/02 • for only lifting or supporting
9/04 • • mechanically
9/06 • • • of screw-and-nut type

9/08 • • • • the screw axis being substantially vertical
9/10 • • by fluid pressure
9/12 • • • of telescopic type
9/14 • for both lifting and manoeuvring
9/16 • • for operating only on one end of vehicle (B60S 9/205 takes precedence) **[4]**
9/18 • • • mechanically
9/20 • • • with fluid-pressure lift
9/205 • • Power driven manoeuvring fittings, e.g. reciprocably driven steppers or rotatably driven cams (vehicles with ground-engaging propulsion means, e.g. walking members, B62D 57/02) **[4]**
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]**
9/215 • • • • driven by an auxiliary motor **[4]**
9/22 • Means for attaching lifting, supporting, or manoeuvring devices to vehicles (for separate devices B60S 11/00)

**11/00 Vehicle modifications for receiving separate lifting, supporting, or manoeuvring devices**

**13/00 Vehicle-manoeuvring devices separate from the vehicle** (vehicle-lifting or pushing devices B66F)
13/02 • Turntables; Traversers (incorporated in vehicle-storing garages E04H)

**B60T VEHICLE BRAKE CONTROL SYSTEMS OR PARTS THEREOF; BRAKE CONTROL SYSTEMS OR PARTS THEREOF, IN GENERAL** (control of electrodynamic brake systems B60L 7/00; conjoint control of brakes and other drive units of vehicles B60W)**; 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]**

**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

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**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**

**Brake control systems or parts thereof**

**7/00 Brake-action initiating means**
7/02 • for personal initiation
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]**

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]**
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]**
8/88 • • with failure responsive means, i.e. means for detecting and indicating faulty operation of the speed responsive control means **[4]**
8/90 • • • using a simulated speed signal to test speed responsive control means **[4]**
8/92 • • • automatically taking corrective action **[4]**
8/94 • • • • on a fluid pressure regulator **[4]**
8/96 • • • • on speed responsive control means **[4]**

**10/00 Control or regulation for continuous braking making use of fluid or powdered medium, e.g. for use when descending a long slope [4]**
10/02 • with hydrodynamic brake **[4]**
10/04 • with hydrostatic brake **[4]**

**11/00 Transmitting braking action from initiating means to ultimate brake actuator without power assistance or drive or where such assistance or drive is irrelevant [5]**
11/04 • transmitting mechanically **[5]**
11/06 • • Equalising arrangements **[5]**
11/08 • • providing variable leverage **[5]**
11/10 • transmitting by fluid means, e.g. hydraulic **[5]**
11/12 • • the transmitted force being varied therein (B60T 11/16-B60T 11/28 take precedence) **[5]**
11/14 • • the transmitted force being substantially unchanged **[5]**
11/16 • • Master control, e.g. master cylinders **[5]**
11/18 • • • Connection thereof to initiating means **[5]**
11/20 • • • Tandem, side-by-side, or other multiple master-cylinder units **[5]**
11/21 • • • • with two pedals operating on respective circuits, pressures therein being equalised when both pedals are operated together, e.g. for steering **[5]**
11/22 • • • characterised by being integral with reservoir **[5]**
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]**
11/228 • • • Pressure-maintaining arrangements, e.g. for replenishing the master cylinder chamber with fluid from a reservoir (B60T 11/232 takes precedence) **[5]**
11/232 • • • Recuperation valves **[5]**
11/236 • • • Piston sealing arrangements **[5]**
11/24 • • Single initiating means operating on more than one circuit, e.g. dual circuits (multiple master-cylinder units B60T 11/20) **[5]**
11/26 • • Reservoirs (integral with master controls B60T 11/22) **[5]**
11/28 • • Valves specially adapted therefor (recuperation valves B60T 11/232) **[5]**
11/30 • • • Bleed valves for hydraulic brake systems **[5]**
11/32 • • • Automatic cut-off valves for defective pipes **[5]**
11/34 • • • Pressure-reducing or limiting valves **[5]**

**13/00 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**
13/02 • with mechanical assistance or drive
13/04 • • by spring or weight (fluid-released B60T 13/10)
13/06 • • by inertia, e.g. flywheel
13/08 • • • Overrun brakes
13/10 • with fluid assistance, drive, or release
13/12 • • the fluid being liquid
13/122 • • • Systems using both master cylinder and distributor valve; Structural associations of master cylinder with distributor valve **[6]**
13/125 • • • Systems using brake pressure distributor valve without master cylinder **[6]**
13/128 • • • Systems using booster hydraulically combined with master cylinder **[6]**
13/13 • • • • with additional direct hydraulic output from booster to brake circuit **[6]**
13/132 • • • Systems using booster having mechanical output, e.g. to master cylinder **[6]**
13/135 • • • Boosters characterised by control valve in booster piston **[6]**
13/138 • • • Pressure supply arrangements **[6]**
13/14 • • • • using accumulators or reservoirs **[6]**
13/16 • • • • using pumps directly, i.e. without interposition of accumulators or reservoirs **[6]**
13/18 • • • • • with control of pump output delivery **[6]**
13/20 • • • • • with control of pump driving means **[6]**
13/22 • • • Brakes applied by springs or weights and released hydraulically
13/24 • • the fluid being gaseous
13/26 • • • Compressed-air systems
13/36 • • • • direct, i.e. brakes applied directly by compressed air
13/38 • • • • Brakes applied by springs or weights and released by compressed air
13/40 • • • • indirect, i.e. compressed-air booster units
13/44 • • • • • with two-chamber booster units
13/45 • • • • • with multiple booster units, e.g. tandem booster units **[5]**
13/46 • • • Vacuum systems

13/48 • • • • direct, i.e. brakes applied directly by vacuum
13/50 • • • • Brakes applied by springs or weights and released by vacuum
13/52 • • • • indirect, i.e. vacuum booster units
13/56 • • • • • with two-chamber booster units
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
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. Main groups B60W 10/00 and B60W 30/00-B60W 50/00 do 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. 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.
4. 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, 2012.01]**
10/101 • • Infinitely variable gearings **[2012.01]**
10/103 • • • of fluid type **[2012.01]**
10/105 • • • of electric type **[2012.01]**
10/107 • • • with endless flexible members **[2012.01]**
10/108 • • • Friction gearings **[2012.01]**
10/109 • • • • of toroid type **[2012.01]**
10/11 • • Stepped gearings **[2012.01]**
10/111 • • • with separate change-speed gear trains arranged in series **[2012.01]**
10/113 • • • with two input flow paths, e.g. double clutch transmission selection of one of the torque flow paths by the corresponding input clutch **[2012.01]**
10/115 • • • with planetary gears **[2012.01]**
10/119 • including control of all-wheel-driveline-means, e.g. transfer gears or clutches for dividing torque between front and rear axles (B60W 10/14 takes precedence) **[2012.01]**
10/12 • including control of differentials **[2006.01, 2012.01]**
10/14 • • Central differentials for dividing torque between front and rear axles **[2012.01]**
10/16 • • Axle differentials, e.g. for dividing torque between the left and right wheels **[2012.01]**
10/18 • including control of braking systems **[2006.01, 2012.01]**
10/184 • • with wheel brakes **[2012.01]**
10/188 • • • hydraulic brakes **[2012.01]**
10/192 • • • electric brakes **[2012.01]**
10/196 • • acting within the driveline, e.g. retarders **[2012.01]**
10/198 • • with exhaust brakes **[2012.01]**
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, 2012.01]**
30/04 • • related to roll-over prevention **[2006.01]**
30/045 • • Improving turning performance **[2012.01]**
30/06 • Automatic manoeuvring for parking **[2006.01]**
30/08 • Predicting or avoiding probable or impending collision **[2006.01, 2012.01]**
30/085 • • Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping **[2012.01]**
30/09 • • Taking automatic action to avoid collision, e.g. braking and steering **[2012.01]**
30/095 • • Predicting travel path or likelihood of collision **[2012.01]**
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, 2012.01]**
30/165 • • • Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar" **[2012.01]**
30/17 • • • with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go **[2012.01]**
30/18 • Propelling the vehicle **[2006.01, 2012.01]**
30/182 • • Selecting between different operative modes, e.g. comfort and performance modes **[2012.01]**
30/184 • • Preventing damage resulting from overload or excessive wear of the driveline **[2012.01]**
30/186 • • • excessive wear or burn out of friction elements, e.g. clutches **[2012.01]**
30/188 • • Controlling power parameters of the driveline, e.g. determining the required power **[2012.01]**
30/19 • • Improvement of gear change, e.g. by synchronisation or smoothing gear shift **[2012.01]**
30/192 • • Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine **[2012.01]**
30/194 • • • related to low temperature conditions, e.g. high viscosity of hydraulic fluid **[2012.01]**
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, 2012.01]**
40/064 • • • Degree of grip **[2012.01]**
40/068 • • • Road friction coefficient **[2012.01]**
40/072 • • • Curvature of the road **[2012.01]**
40/076 • • • Slope angle of the road **[2012.01]**
40/08 • related to drivers or passengers **[2006.01, 2012.01]**
40/09 • • Driving style or behaviour **[2012.01]**
40/10 • related to vehicle motion **[2006.01, 2012.01]**
40/101 • • Side slip angle of tyre **[2012.01]**
40/103 • • Side slip angle of vehicle body **[2012.01]**
40/105 • • Speed **[2012.01]**
40/107 • • Longitudinal acceleration **[2012.01]**
40/109 • • Lateral acceleration **[2012.01]**
40/11 • • Pitch movement **[2012.01]**
40/112 • • Roll movement **[2012.01]**
40/114 • • Yaw movement **[2012.01]**
40/12 • related to parameters of the vehicle itself **[2006.01, 2012.01]**
40/13 • • Load or weight **[2012.01]**

**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, 2012.01]**
50/023 • • Avoiding failures by using redundant parts **[2012.01]**
50/029 • • Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts **[2012.01]**
50/032 • • Fixing failures by repairing failed parts, e.g. loosening a sticking valve **[2012.01]**
50/035 • • Bringing the control units into a predefined state, e.g. giving priority to particular actuators **[2012.01]**
50/038 • • Limiting the input power, torque or speed **[2012.01]**
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, 2012.01]**
50/10 • • Interpretation of driver requests or demands **[2012.01]**
50/12 • • Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation **[2012.01]**
50/14 • • Means for informing the driver, warning the driver or prompting a driver intervention **[2012.01]**
50/16 • • • Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal **[2012.01]**

# B61 RAILWAYS

**Note(s)**

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

- "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 conveyors, scraper conveyors 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]**

**Note(s)**

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.

**Subclass index**

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

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**1/00 General arrangement of stations, platforms, or sidings; Railway networks; Rail-vehicle marshalling systems** (shunting humps or shunting devices B61J; construction of platforms E01F 1/00; time-tables G09D)

1/02 • General arrangement of stations and platforms including protection devices for the passengers

**Elevated railways**

**3/00 Elevated railway systems with suspended vehicles** (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 • with self-propelled vehicles

**5/00 Elevated railway systems without suspended vehicles** (with monorail B61B 13/04; tracks therefor E01B 25/00)

5/02 • with two or more rails

**Rope railways; Power-and-free systems [2]**

**7/00 Rope railway systems with suspended flexible tracks**

7/02 • with separate haulage cables

7/04 • with suspended tracks serving as haulage cables

7/06 • with self-propelled vehicles

**9/00 Tramway or funicular systems with rigid track and cable traction** (haulage clips B61B 12/12; shunting devices with cable traction B61J) **[2]**

**10/00 Power-and-free systems** (ski-lift, sleigh-lift or like trackless systems with guided towing cables only B61B 11/00) **[2]**

10/02 • with suspended vehicles **[2]**

10/04 • with vehicles rolling trackless on the ground **[2]**

**11/00 Ski-lift, sleigh-lift or like trackless systems with guided towing cables only**

**12/00 Component parts, details, or accessories for rope railways or power-and-free systems not provided for in groups B61B 7/00-B61B 11/00** (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]**

**Other railway systems; Combinations of systems**

**13/00 Other railway systems**

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 conveyors 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)

**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

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**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

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**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
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)
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)

**B61D BODY DETAILS OR KINDS OF RAILWAY VEHICLES** (vehicles in general B60; adaptation of vehicles to special systems B61B; underframes B61F)

**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
BODY DETAILS AND ACCESSORIES
Details
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
Accessories
signs, ticket-holders.....41/00
covers; securing load.....39/00, 45/00
other.....49/00

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**Kinds of railway or tramway vehicles**

**1/00** **Carriages for ordinary railway passenger traffic** (mine cars B61D 11/00; tramcars B61D 13/00)
1/02 • General arrangements in sleeping or couchette carriages (B61D 1/08 takes precedence)
1/04 • General arrangements of seats (B61D 1/06 takes precedence; seats per se B61D 33/00)
1/06 • with multiple deck arrangement
1/08 • • of sleeping carriages

**3/00** **Wagons or vans** (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)
3/02 • with multiple deck arrangements (for carrying vehicles B61D 3/18) **[4]**
3/04 • with movable floors, e.g. rotatable or floors which can be raised or lowered
3/06 • Flat-bottomed cars convertible into hoppers
3/08 • Flat wagons including posts or standards
3/10 • Articulated vehicles
3/12 • • comprising running gear interconnected by loads
3/14 • • comprising running gear interconnected by load supports facilitating low-level load transport
3/16 • adapted for carrying special loads **[4]**
3/18 • • for vehicles **[4]**
3/20 • • for forwarding containers **[4]**

**5/00** **Tank wagons for carrying fluent materials** (tank aspects B65D 88/00, B65D 90/00, F17C)
5/02 • having more than one tank
5/06 • Mounting of tanks; Integral bodies and frames

**7/00** **Hopper cars** (flat-bottomed cars convertible into hoppers B61D 3/06) **[2]**
7/02 • with discharge openings in the bottoms (with body in two halves and discharge by tipping the halves B61D 9/00)
7/04 • • the openings being above axle level during discharge
7/06 • with openings capable of discharging both between and outside the wheels
7/08 • with openings capable of discharging only outside the wheels
7/10 • • the discharge being assisted by tipping the bottom
7/12 • the hoppers being movable (B61D 9/00 takes precedence)
7/14 • Adaptations of hopper elements to railways
7/16 • • Closure elements for discharge openings
7/18 • • • pivoted
7/20 • • • sliding
7/22 • • • Sealing means thereof
7/24 • • • Opening or closing means
7/26 • • • • mechanical
7/28 • • • • hydraulic or pneumatic
7/30 • • • • controlled by means external to cars
7/32 • • Means for assisting charge or discharge

**9/00** **Tipping wagons**
9/02 • characterised by operating means for tipping
9/04 • Adaptations of rail vehicle elements to tipping wagons
9/06 • • Bodies
9/08 • • Frames; Supporting or guiding means for the bodies
9/10 • • Devices preventing overturning when tipping
9/12 • • Body fitments or devices facilitating or controlling outflow on discharge
9/14 • Tipping systems controlled by trackside means

**11/00** **Mine cars** (B61D 5/00-B61D 9/00 take precedence)
11/02 • Body construction

**13/00** **Tramway vehicles**
13/02 • Double-deckers

**15/00** **Other railway vehicles, e.g. scaffold cars; Adaptations of vehicles for use on railways** (conveyor frames mounted for movement on rail tracks B65G 41/02; wheeled machines used in permanent-way construction or maintenance E01B)
15/02 • Breakdown cranes (crane gear B66C)
15/04 • convertible into other non-vehicular apparatus, e.g. exhibition stands
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

**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 specially adapted for rail vehicles** (locks for vehicles E05B 77/00 – E05B 85/00; 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

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**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
3/08 • • without driven axles or wheels
3/10 • • • with three or more axles
3/12 • specially modified for carrying adjacent vehicle bodies of articulated trains
3/14 • specially modified for reducing air resistance
3/16 • with a separate axle for each wheel

**5/00 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**
5/02 • Arrangements permitting limited transverse relative movements between vehicle underframe or bolster and bogie; Connections between underframes and bogies
5/04 • • Bolster supports or mountings (side bearings B61F 5/14)
5/06 • • • incorporating metal springs
5/08 • • • incorporating rubber springs

5/10 • • • incorporating fluid springs
5/12 • • • incorporating dampers
5/14 • • Side bearings
5/16 • • Centre bearings or other swivel connections between underframes and bolsters or bogies
5/18 • • • King-bolts
5/20 • • • with springs allowing transverse movements
5/22 • • Guiding of the vehicle underframes with respect to the bogies
5/24 • • • Means for damping or minimising the canting, skewing, pitching, or plunging movements of the underframes
5/26 • Mounting or securing axle-boxes in vehicle or bogie underframes
5/28 • • Axle-boxes integral with, or directly secured to, vehicle or bogie underframes
5/30 • • Axle-boxes mounted for movement under spring control in vehicle or bogie underframes
5/32 • • • Guides, e.g. plates, for axle-boxes
5/34 • • • • Wedge mechanisms for adjusting clearance between underframes and axles
5/36 • • • Arrangements for equalising or adjusting the load on wheels or springs, e.g. yokes
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
5/40 • • Bogies with side frames mounted for longitudinal relative movements
5/42 • • Adjustment controlled by buffer or coupling gear
5/44 • • Adjustment controlled by movements of vehicle body
5/46 • • Adjustment controlled by a sliding axle under the same vehicle underframe
5/48 • • Trailing or leading bogies for locomotives or motor-driven railcars (B61F 5/40 takes precedence) **[2]**
5/50 • Other details
5/52 • • Bogie frames

**7/00 Rail vehicles equipped for use on tracks of different width**

**9/00 Rail vehicles characterised by means for preventing derailing, e.g. by use of guide wheels**

**11/00 Rail vehicles characterised by rail-engaging elements other than wheels, e.g. balls**

**13/00 Rail vehicles characterised by wheel arrangements, not otherwise provided for**

**15/00 Axle-boxes** (mounting or securing axle-boxes B61F 5/26; lubrication B61F 17/00; bearings in general F16C)
15/02 • with journal bearings
15/04 • • for locomotives
15/06 • • for cars
15/08 • • the axle being slidable or tiltable in the bearings
15/10 • • • and having springs opposing such movements
15/12 • with roller, needle, or ball bearings
15/14 • • constructed for taking-up axial pressure
15/16 • • the axle being slidable or tiltable in the bearings
15/18 • • • and having springs opposing such movements
15/20 • Details
15/22 • • Sealing means preventing entrance of dust or leakage of oil
15/24 • • • preventing oil leakage when vehicle is tilted or inverted
15/26 • • Covers; Sealing thereof
15/28 • • Axle-boxes modified to ensure electrical conductivity

**17/00 Lubrication specially adapted for axle-boxes of rail vehicles** (lubrication in general F16N)
17/02 • with oil
17/04 • • Lubrication by stationary devices
17/06 • • • by means of a wick or the like
17/08 • • • • Devices for pressing the wick or the like against the rotating axle
17/10 • • • by means of an oil bath
17/12 • • • by gravity
17/14 • • Rotating lubricating devices
17/16 • • • with rings
17/18 • • • with chains
17/20 • • • with scoops or the like attached to, or coupled with, the axle
17/22 • • • with discs, rollers, or belts engaging the axle
17/24 • • by built-in lubricating pumps
17/26 • • by external feeding means, e.g. pneumatic devices
17/28 • • Applications of oil cleaners not otherwise provided for
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 Wheel guards; Bumpers; Obstruction removers or the like** (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 Subject matter not provided for in other groups of this subclass [2006.01]**

## B61G COUPLINGS SPECIALLY ADAPTED FOR RAILWAY VEHICLES; DRAUGHT OR BUFFING APPLIANCES SPECIALLY ADAPTED FOR RAILWAY VEHICLES

<u>Couplings peculiar to railway vehicles</u>

**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

**<u>Draught or buffing appliances peculiar to railway or tramway vehicles</u>**

**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)

**11/00 Buffers** (springs F16F)
11/02 • with metal springs
11/04 • • with helical springs
11/06 • • • arranged to damp each other by mutual friction
11/08 • with rubber springs
11/10 • with combined rubber and metal springs
11/12 • with fluid springs or shock-absorbers; Combinations thereof
11/14 • absorbing shocks by mechanical friction action; Combinations of mechanical shock-absorbers and springs (B61G 11/06 takes precedence)
11/16 • absorbing shocks by permanent deformation of buffer element
11/18 • Details

**B61H** **BRAKES OR OTHER RETARDING APPARATUS PECULIAR TO RAIL VEHICLES; ARRANGEMENTS OR DISPOSITIONS 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

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**1/00** **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** (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14; wheels B60B)

**3/00** **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** (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14)

**5/00** **Applications or arrangements of brakes with substantially-radial braking surfaces pressed together in axial direction, e.g. disc brakes** (self-applying brakes B61H 11/02; combinations of different types of brakes B61H 11/14)

**7/00** **Brakes with braking members co-operating with the track** (positive railway stops or track brakes secured to permanent way B61K 7/00)
7/02 • Scotch-blocks, skids, or like track-engaging shoes
7/04 • • attached to railway vehicles
7/06 • • • Skids
7/08 • • • • electromagnetically operated
7/10 • • unattached
7/12 • Grippers co-operating frictionally with tracks

**9/00** **Brakes characterised by, or modified for, their application to special railway systems or purposes**
9/02 • for aerial, e.g. rope, railways
9/04 • for preventing or controlling movement in one direction or, selectively, in either direction
9/06 • for storing energy during braking action

**11/00** **Applications or arrangements of braking or retarding apparatus not otherwise provided for; Combinations of apparatus of different kinds or types**
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
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
11/16 • Removable self-contained brake units

**13/00** **Actuating rail-vehicle brakes** (self-applying brakes B61H 11/02; wear-compensating mechanisms B61H 15/00)
13/02 • Hand or other personal actuation
13/04 • • by mechanisms incorporating toothed gearing
13/06 • Actuating or influencing the brakes by backward-pressure of buffers or coupling gear, e.g. buffer brakes
13/20 • Transmitting mechanisms (wear-compensating mechanisms B61H 15/00)
13/22 • • for braking a single wheel or wheels at one side only, e.g. for locomotives or motor railcars
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
13/26 • • for cars or bogies with more than two axles or bogies, the mechanisms at each side being interconnected
13/28 • • with variable leverage or mechanical advantage to obtain quick take-up
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)
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; derailing, 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

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**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 • • Derailing 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
9/12 • Measuring or surveying wheel-rims (measuring techniques G01)

**11/00 Serving peculiar to locomotives, e.g. filling with, or emptying of, water, sand, or the like at the depots** (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)
11/02 • Water columns for locomotives

**13/00 Other auxiliaries or accessories for railways** (safety belts or body harnesses A62B 35/00)
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

**B61L** **GUIDING RAILWAY TRAFFIC; ENSURING THE SAFETY OF RAILWAY TRAFFIC** (brakes or auxiliary equipment B61H, B61K; point or crossing construction E01B)

**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

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**1/00** **Devices along the route controlled by interaction with the vehicle or vehicle train** (detonators B61L 5/20; operation of points or signals by passage of the vehicle B61L 11/00, B61L 13/00; operation of gates, or gates and signals, by approaching vehicle B61L 29/18)

1/02 • Electric devices associated with track
1/04 • • mechanically actuated by a part of the vehicle
1/06 • • actuated by deformation of rail; actuated by vibration in rail
1/08 • • magnetically actuated; electrostatically actuated
1/10 • • actuated by electromagnetic radiation; actuated by particle radiation
1/12 • Electric devices associated with overhead trolley wires
1/14 • Devices for indicating the passing of the end of the vehicle or vehicle train
1/16 • Devices for counting axles; Devices for counting vehicles
1/18 • Railway track circuits (rail joints E01B 11/00, e.g. insulated rail joints E01B 11/54)
1/20 • Safety arrangements for preventing or indicating malfunction of the device, e.g. by leakage current, by lightning

**3/00** **Devices along the route for controlling devices on the vehicle or vehicle train, e.g. to release brake, to operate a warning signal**

3/02 • at selected places along the route, e.g. intermittent control
3/04 • • controlling mechanically
3/06 • • controlling by electromagnetic or particle radiation, e.g. by light beam
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; 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, B61L 13/00 take 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**
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**
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**
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**
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

**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
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
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
23/28 • • using non-automatic blocking from a place along the route
23/30 • • using automatic section blocking
23/32 • • • with provision for the blocking of passing sidings
23/34 • for indicating the distance between vehicles or vehicle trains by the transmission of signals therebetween **[4]**

**25/00 Recording or indicating positions or identities of vehicles or vehicle trains or setting of track apparatus**
25/02 • Indicating or recording positions or identities of vehicles or vehicle trains
25/04 • • Indicating or recording train identities
25/06 • Indicating or recording the setting of track apparatus, e.g. of points, of signals
25/08 • • Diagrammatic displays

**27/00 Central traffic control systems**
27/02 • Manual systems
27/04 • Automatic systems, e.g. controlled by train; Change-over to manual control

**29/00 Safety means for rail/road crossing traffic**
29/02 • Guards or obstacles for preventing access to the route (cattle guards connected to the permanent way E01B 17/00)
29/04 • Gates for level crossings
29/06 • • yielding to vehicles in one direction but operated in a different direction
29/08 • Operation of gates; Combined operation of gates and signals
29/10 • • Means for securing gates in their desired position
29/12 • • Manual operation
29/14 • • • mechanically
29/16 • • • electrically
29/18 • • Operation by approaching rail vehicle or rail vehicle train
29/20 • • • mechanically
29/22 • • • electrically

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
29/26 • • mechanically operated
29/28 • • electrically operated
29/30 • • • Supervision, e.g. monitoring arrangements
29/32 • • • Timing, e.g. advance warning of approaching train

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

# 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

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**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
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

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**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**

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**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.

**1/00 Types of vehicles**
1/02 • Passenger vehicles
1/04 • Load-carrying vehicles
1/06 • • convertible, e.g. with extensible parts, with changeable wheel track
1/08 • Racing vehicles, e.g. sulkies

**3/00 Undercarriages or running gear of vehicles; Axle supports** (undercarriages for supporting agricultural tools or apparatus A01B 35/30, A01B 39/24, A01B 51/00)
3/02 • Front wheel carriers; Bogies; Steering mechanisms for bogies

**5/00 Draught assemblies** (traction harness B68B 3/00)
5/02 • Shafts, poles, or thills; Mountings thereof, e.g. resilient, adjustable
5/04 • Swingletrees; Mountings thereof; Draught equalisers for a span of draught animals; Mountings for traces

**7/00 Braking mechanisms and brake control devices specially adapted for animal-drawn vehicles**
7/02 • Mechanisms for locking ground-engaging wheels, e.g. engaging spokes

7/04 • Automatic brake control devices

**9/00 Carriers or holders for whips; Holders for reins forming part of, or attached to, vehicles** (reins or whips per se B68B)

**11/00 Safeguarding appliances not otherwise provided for, e.g. for readily-releasing unmanageable draught animals**

11/02 • Providing for disengaging thills

11/04 • • combined with automatic braking

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

**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
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STEERING
- 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

ACCESSORIES FOR COLLISION MARKING.....41/00


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**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]**

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**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
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**

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**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

**61/00 Motor vehicles or trailers, characterised by the arrangement or number of wheels, not otherwise provided for, e.g. four wheels in diamond pattern**
61/02 • with two road wheels in tandem on the longitudinal centre line of the vehicle
61/04 • • with two other wheels which are coaxial
61/06 • with only three wheels
61/08 • • with single front wheel
61/10 • with more than four wheels
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)

**63/00 Motor vehicles or trailers not otherwise provided for**
63/02 • Motor vehicles
63/04 • • Component parts or accessories
63/06 • Trailers (vehicles comprising living accommodation for people, e.g. caravans, camping or like vehicles, B60P 3/32)
63/08 • • Component parts or accessories

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**65/00 Designing, manufacturing, e.g. assembling, facilitating disassembly, or structurally modifying motor vehicles or trailers, not otherwise provided for**
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]**
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]**
65/06 • • the sub-units or components being doors, windows, openable roofs, lids, bonnets, or weather strips or seals therefor **[7]**
65/08 • • • Weather strips or seals **[7]**
65/10 • • the sub-units or components being engines, clutches or transmissions **[7]**

65/12 • • the sub-units or components being suspensions, brakes or wheel units **[7]**
65/14 • • the sub-units or components being passenger compartment fittings, e.g. seats, linings, trim, instrument panels **[7]**
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]**

**67/00 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]**

**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]**

**101/00 Road speed [5]**

**103/00 Acceleration or deceleration in the direction of travel [5]**

**105/00 Loss of traction, e.g. wheel spin or skid [5]**

**107/00 Temperature [5]**

**109/00 Presence, absence or inactivity of driver or operator, e.g. by sensing the operation of the clutch, brake or throttle [5]**

**111/00 Forces disturbing the intended course of the vehicle, e.g. forces acting transversely of the direction of travel [5]**

**113/00 Position of parts of the steering mechanism, e.g. the steered wheels or the steering wheel [5]**

**115/00 Angle of articulation of articulated vehicle; Angle of tow-bar to towing vehicle [5]**

**117/00 Angular velocity of steering wheel [5]**

**119/00 Steering wheel torque [5]**

**121/00 Force applied to the steering linkage [5]**

**123/00 Fluid pressure supply for vehicle equipment, e.g. for power-assisted steering; Presence, failure or threshold values thereof; Lubricating or other fluid capacities [5]**

**125/00 Particular gear ratio selected [5]**

**127/00 Engine speed [5]**

**131/00 Load, including height of vehicle dependent on load; State of vehicle vibration damping means [5]**

**133/00 Trim or inclination, including road gradient [5]**

**135/00 Air moisture content [5]**

**137/00 Conditions not specified in groups B62D 101/00-B62D 135/00 [5]**

## B62H 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

**Note(s)**

In this subclass, the following term is used with the meaning indicated:
- "cycles" includes scooters.

**1/00 Supports or stands forming part of, or attached to, cycles**
1/02 • Articulated stands, e.g. in the shape of hinged arms (B62H 1/10 takes precedence)
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
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**

**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

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**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
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**

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**

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**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**

**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]**

## 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

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**1/00 Unicycles**

**3/00 Bicycles**
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

**5/00 Cycles with handlebars, equipped with three or more main road wheels** (cycle supports or stands equipped with additional wheels for ride stabilisation B62H 1/12) **[1, 2013.01]**
5/003 • Cycles with four or more wheels, specially adapted for disabled riders, e.g. personal mobility type vehicles with four wheels (wheelchairs A61G 5/00) **[2013.01]**
5/007 • • power-driven **[2013.01]**
5/01 • Motorcycles with four or more wheels (specially adapted for disabled riders B62K 5/003) **[2013.01]**
5/02 • Tricycles (children's tricycles B62K 9/02) **[1, 2013.01]**
5/023 • • specially adapted for disabled riders, e.g. personal mobility type vehicles with three wheels (wheelchairs A61G 5/00) **[2013.01]**
5/025 • • • power-driven **[2013.01]**
5/027 • • Motorcycles with three wheels (specially adapted for disabled riders B62K 5/023) **[2013.01]**
5/05 • • characterised by a single rear wheel **[2013.01]**
5/06 • • Frames for tricycles
5/08 • with steering devices acting on two or more wheels
5/10 • with means for inwardly inclining the vehicle body on bends **[2013.01]**

**7/00 Freight- or passenger-carrying cycles**
7/02 • Frames
7/04 • • having a carrying platform (article-carrying accessories B62J 7/00-B62J 11/00)

**9/00 Children's cycles** (toy vehicles A63H 17/00)

9/02 • Tricycles

**11/00** **Motorcycles, engine-assisted cycles or motor scooters with one or two wheels** (fairings or streamlining parts not forming part of the frame B62J; transmission of drive from engines 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 • Handlebar constructions, or arrangements of controls thereon, specially adapted thereto (hand controls per se B62K 23/02)

**13/00** **Cycles convertible to, or transformable into, other types of cycles or land vehicles** (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

**15/00** **Collapsible or foldable cycles**

**17/00** **Cycles not otherwise provided for**

**19/00** **Cycle frames** (cycle frames specially adapted for one particular kind of cycle specified in groups B62K 1/00-B62K 17/00, see 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 per se B62J 13/00)
19/46 • Luggage carriers forming part of frame (luggage carriers per se B62J 7/00)
19/48 • Fairings forming part of frame

**21/00** **Steering devices** (steering devices specially adapted for one particular kind of cycle specified in groups B62K 1/00-B62K 17/00, see 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 • Handlebars; Handlebar stems
21/14 • • having resilient parts therein
21/16 • • having adjustable parts therein
21/18 • Connections between forks and handlebars or handlebar stems
21/20 • • resilient
21/22 • • adjustable
21/24 • • readily releasable
21/26 • Handlebar grips (twist grips B62K 23/04)

**23/00** **Rider-operated controls specially adapted for cycles, i.e. means for initiating control operations, e.g. levers, grips** (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

**25/00** **Axle suspensions** (for vehicles in general B60G)
25/02 • for mounting axles rigidly on cycle frame or fork, e.g. adjustably
25/04 • for mounting axles resiliently on cycle frame or fork (for sidecars, forecars, or the like B62K 27/06)
25/06 • • with telescopic fork, e.g. including auxiliary rocking arms
25/08 • • • for front wheel
25/10 • • • for rear wheel
25/12 • • with rocking arm pivoted on each fork leg (in combination with telescopic fork B62K 25/06)
25/14 • • • with single arm on each fork leg
25/16 • • • • for front wheel
25/18 • • • • • the arm being pivoted intermediate its ends
25/20 • • • • for rear wheel
25/22 • • • with more than one arm on each fork leg
25/24 • • • • for front wheel
25/26 • • • • for rear wheel
25/28 • • with pivoted chain-stay
25/30 • • • pivoted on pedal crank shelf (B62K 25/32 takes precedence)
25/32 • • • the chain-stay forming a chain-guard

**27/00** **Sidecars; Forecars or the like** (trailers B60P, B62D; characterised by carrying propulsion engine B62M)
27/02 • Frames
27/04 • Car bodies; Fairings
27/06 • Resilient axle suspension
27/08 • Resilient car-body suspension on frame
27/10 • Other component parts or accessories

27/12 • • Coupling parts for attaching cars or the like to cycle; Arrangements thereof

27/14 • • • Resilient coupling parts

27/16 • • Hoods; Weather-guards, e.g. windscreens

**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.

**1/00 Brakes; Arrangements thereof** (back-pedalling brakes B62L 5/00)

1/02 • in which cycle wheels are engaged by brake elements

1/04 • • the tyre surfaces being engaged

1/06 • • the wheel-rim being engaged

1/08 • • • by the elements moving radially relative to the wheel

1/10 • • • by the elements moving substantially parallel to the wheel axis

1/12 • • • • the elements being mounted on levers pivotable about a common axis

1/14 • • • • the elements being mounted on levers pivotable about different axes

1/16 • • • • • the axes being located intermediate the ends of the levers

**3/00 Brake-actuating mechanisms** (actuating mechanisms for back-pedalling brakes B62L 5/00; Bowden mechanisms F16C 1/10)**; Arrangements thereof**

3/02 • for control by a hand lever (hand levers for control of cycles in general B62K 23/06)

3/04 • for control by a foot lever (foot levers for control of cycles in general B62K 23/08)

3/06 • Means for locking the actuating mechanisms (locking a cycle braking device directly B62H 5/18)

3/08 • Mechanisms specially adapted for braking more than one wheel

**5/00 Brakes, or actuating mechanisms therefor, controlled by back-pedalling** (free-wheel devices specially adapted for cycles F16D 41/00)

5/02 • the brakes being actuated through coacting coaxial cones

5/04 • • the brakes being of expanding-brake-bushing type

5/06 • • the brakes being of disc type

5/08 • • the brakes being of shoe type

5/10 • the brakes being actuated through coacting cams and balls or rollers

5/12 • • the brakes being of expanding-brake-bushing type

5/14 • • the brakes being of disc type

5/16 • • the brakes being of shoe type

5/18 • the brakes being additionally controlled by alternative means

5/20 • the brakes having adjustable braking power

**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 souce 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]**
1/10 • involving devices which enable the mechanical storing and releasing of energy occasionally, e.g. arrangement of flywheels **[1, 2010.01]**
1/12 • operated by both hand and foot power
1/14 • operated exclusively by hand power
1/16 • • by means of a to-and-fro movable handlebar
1/18 • by movement of rider's saddle
1/20 • • with additional rider propulsion means
1/24 • with reciprocating levers, e.g. foot levers (levers which can be immobilised as foot rests B62M 5/00) **[2013.01]**
1/26 • • characterised by rotary cranks combined with reciprocating levers **[2013.01]**
1/28 • • characterised by the use of flexible drive members, e.g. chains **[2013.01]**
1/30 • • characterised by the use of intermediate gears **[2013.01]**
1/32 • • characterised by directly driving the wheel axle, e.g. by using a ratchet wheel **[2013.01]**
1/34 • by walking on an endless belt **[2013.01]**
1/36 • with rotary cranks, e.g. with pedal cranks (B62M 1/34 takes precedence; combined with reciprocating levers B62M 1/26; cranks which can be immobilised as foot rests B62M 5/00) **[2013.01]**
1/38 • • for directly driving the wheel axle **[2013.01]**

**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

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6/10 • Rider propelled cycles with auxiliary combustion engine **[2010.01]**
6/15 • • Control or actuating devices therefor **[2010.01]**
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**

**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

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**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** (arrangements of vessel ventilation, heating, cooling, or air-conditioning B63J 2/00; floating substructures as supports of dredgers or soil-shifting machines E02F 9/06) **[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

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**1/00 Hydrodynamic or hydrostatic features of hulls or of hydrofoils** (hulls peculiar to submarines B63B 3/13; keels B63B 3/38)

1/02 • deriving lift mainly from water displacement (B63B 1/16 takes precedence)
1/04 • • with single hull
1/06 • • • Shape of fore part
1/08 • • • Shape of aft part
1/10 • • with multiple hulls
1/12 • • • the hulls being interconnected rigidly
1/14 • • • the hulls being interconnected resiliently
1/16 • deriving additional lift from hydrodynamic forces
1/18 • • of hydroplane type
1/20 • • • having more than one planing surface (B63B 1/22 takes precedence)
1/22 • • • with adjustable planing surfaces
1/24 • • of hydrofoil type
1/26 • • • having more than one hydrofoil (B63B 1/28 takes precedence)
1/28 • • • with movable hydrofoils
1/30 • • • • retracting or folding
1/32 • Other means for varying the inherent hydrodynamic characteristics of hulls
1/34 • • by reducing surface friction
1/36 • • • using mechanical means
1/38 • • • using air bubbles or air layers
1/40 • • by diminishing wave resistance

**3/00 Constructions of hulls** (non-metallic hulls B63B 5/00)

3/02 • Hulls assembled from prefabricated sub-units
3/04 • • with permanently-connected sub-units
3/06 • • • the sub-units being substantially identical
3/08 • • with detachably-connected sub-units
3/09 • Hulls constructed of non-magnetic metal
3/10 • Armoured hulls
3/12 • Frameless hulls
3/13 • Hulls built to withstand hydrostatic pressure when fully submerged, e.g. submarine hulls
3/14 • Hull parts (hull armour B63B 3/10)
3/16 • • Shells (ports or closures therefor B63B 19/00)
3/18 • • • characterised by being formed predominantly of parts that may be developed into plane surfaces
3/20 • • • of double type
3/22 • • • with corrugations
3/24 • • • Means for diminishing external ridges or protrusions
3/26 • • Frames
3/28 • • • of transverse type; Stringers
3/30 • • • • Bilge knees; Beam knees
3/32 • • • Web frames; Web beams
3/34 • • • of longitudinal type; Bulkhead connections
3/36 • • • Combined frame systems
3/38 • • Keels (movable keels B63B 41/00)
3/40 • • Stern posts; Stern frames
3/42 • • Shaft brackets
3/44 • • Bilge keels (stabilising aspect B63B 39/06)
3/46 • • Stems
3/48 • • Decks (planking B63B 5/06)
3/50 • • • of vaulted type
3/52 • • • Pillars; Deck girders
3/54 • • • Hatch openings
3/56 • • Bulkheads; Bulkhead reinforcements (arrangements of watertight doors B63B 43/24)
3/58 • • • with flat plating
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

**5/00 Hulls characterised by their construction of non-metallic material**

5/02 • made predominantly of wood
5/04 • • Carcasses
5/06 • • Decks; Shells
5/08 • • • with single-layer planking
5/10 • • • with multiple-layer planking
5/12 • made predominantly of wood with metal reinforcement, i.e. composite construction
5/14 • made predominantly of concrete, e.g. reinforced
5/16 • • monolithic
5/18 • • built-up from elements
5/20 • • • in combination with elements of other materials
5/22 • • with reinforcing members external to shell
5/24 • made predominantly of plastics

**7/00 Collapsible, foldable, inflatable, or like vessels** (foldable pontoons B63B 35/36)

7/02 • comprising only rigid parts
7/04 • • sectionalised
7/06 • having parts of non-rigid material
7/08 • • inflatable (inflatable buoys B63B 22/22; inflatable life-rafts B63C 9/04)

**9/00 Methods of designing, building, maintaining, converting, refitting, repairing, or determining properties of, vessels, not otherwise provided for** (shuttering for building concrete vessels E04G) **[2]**

9/02 • using towing tanks or model basins for designing
9/04 • Rebuilding ships, e.g. increasing tonnage
9/06 • Methods of building hulls **[2]**
9/08 • Determining vessel properties with respect to stability or balance **[2]**

**11/00** **Interior subdivision of hulls** (bulkhead space construction B63B 3/56)
11/02 • Arrangement of bulkheads, e.g. defining cargo spaces
11/04 • Constructional features of bunkers or ballast tanks, e.g. with elastic walls
11/06 • Propeller-shaft tunnels

**13/00** **Conduits for emptying or ballasting; Self-bailing equipment; Scuppers**
13/02 • Ports for passing water through vessels' sides

**15/00** **Superstructures; Arrangements or adaptations of masts**
15/02 • Staying of masts or of other superstructures

**17/00** **Vessels parts, details, or accessories, not otherwise provided for**
17/02 • Awnings
17/04 • Stanchions; Guard-rails
17/06 • Refuse discharge, e.g. for ash

**19/00** **Arrangements or adaptations of ports, doors, windows, port-holes, or other openings or covers** (scuppers B63B 13/00; arrangements of watertight doors in bulkheads B63B 43/24)
19/02 • Windows specially adapted for ships or other waterborne vessels, e.g. clear-view screens or portholes
19/04 • Air-catching equipment related to windows or port-holes
19/06 • • readily detachable
19/08 • Ports or like openings in vessels' sides (ports for passing water through vessels' sides B63B 13/02)
19/10 • • Coal ports
19/12 • Hatches; Hatchways (hatch coamings B63B 3/54)
19/14 • • Hatch covers
19/16 • • • with detachable boards
19/18 • • • slidable
19/19 • • • foldable **[3]**
19/197 • • • • actuated by fluid pressure **[3]**
19/203 • • • • actuated by cables or the like **[3]**
19/21 • • • of roll-up type **[3]**
19/22 • • Hatch beams
19/24 • • Hatch fastenings, e.g. cleats
19/26 • • Gaskets; Draining means
19/28 • • Other safety devices

**21/00** **Tying-up; Shifting, towing, or pushing equipment; Anchoring** (dynamic anchoring B63H 25/00) **[4]**
21/02 • Magnetic mooring equipment
21/04 • Fastening or guiding equipment for chains, ropes, hawsers, or the like
21/06 • • Bollards
21/08 • • Clamping devices
21/10 • • Fairleads
21/12 • • Rat guards
21/14 • • Hawse-holes; Hawse-pipes; Hawse-hole closures
21/16 • using winches
21/18 • Stoppers for anchor chains
21/20 • Adaptations of chains, ropes, hawsers, or the like, or of parts thereof
21/22 • Handling or lashing anchors
21/24 • Anchors
21/26 • • securing to bed
21/27 • • • by suction **[2]**
21/28 • • • driven-in by explosive charge
21/29 • • • by weight, e.g. flukeless weight anchors **[2]**
21/30 • • rigid when in use **[3]**
21/32 • • • with one fluke
21/34 • • • with two or more flukes
21/36 • • • • foldable
21/38 • • pivoting when in use **[3]**
21/40 • • • with one fluke
21/42 • • • • of ploughshare type
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
21/60 • • • Quick releases
21/62 • • characterised by moving of more than one vessel
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) **[2]**
21/66 • • Equipment specially adapted for towing underwater objects or vessels, e.g. fairings for tow-cables **[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 **[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 buoys with gas generating means (B63B 22/12 takes precedence) **[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 **[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
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
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 or trimming; Vessels characterised thereby** (fishing vessel fish holds B63B 35/24; 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
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; floating cranes B66C 23/52) **[3]**

**Note(s)**

Groups B63B 27/30-B63B 27/36 take precedence over groups B63B 27/04-B63B 27/28.

27/04 • of derricks **[3]**
27/08 • of winches **[3]**
27/10 • of cranes **[3]**
27/12 • • of gantry type **[3]**
27/14 • of ramps, gangways or outboard ladders **[3]**
27/16 • of lifts or hoists **[3]**
27/18 • of cableways, e.g. with breeches-buoys **[3]**
27/22 • of conveyors, e.g. of endless-belt or screw-type **[3, 6]**
27/24 • of pipe-lines **[3]**
27/25 • • for fluidised bulk material **[3]**
27/26 • of devices with throwing action **[3]**
27/28 • of chutes **[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 **[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 specially adapted for vessels
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; mine-laying or mine-sweeping vessels, submarines, aircraft carriers or other vessels characterised by their offensive or defensive arrangements B63G) **[5]**
35/03 • Pipe-laying vessels **[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 **[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 • Pontoons **[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) **[5]**
35/52 • • Nets, slipways or the like, for recovering aircraft from the water **[5]**
35/53 • • Floating runways **[3, 5]**
35/54 • Ferries **[5]**
35/56 • Lightships (marking of navigational route with anchored lightships B63B 51/02) **[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 (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 **[5]**
35/68 • • for towing **[5]**
35/70 • • for pushing **[5]**
35/71 • Canoes, kayaks or the like **[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 members (ring-shaped life-buoys B63C 9/08) **[4, 5]**
35/78 • • • U-shaped buoyant members **[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 [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 or side boards**

**43/00 Improving safety of vessels, e.g. damage control, not otherwise provided for**
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
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 Arrangements or adaptations of signalling or lighting devices** (life-buoys, life-belts, life-jackets, life-suits or the like, characterised by signalling means B63C 9/20) **[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**

**51/00 Marking of navigational routes otherwise than with buoys [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**
57/02 • by washing
57/04 • by ventilating

**59/00 Hull protection specially adapted for vessels; Cleaning devices specially adapted for vessels**
59/02 • Fenders integral with waterborne vessels or specially adapted therefor; Rubbing-strakes (skid fenders for lifeboats B63B 23/36)
59/04 • Preventing hull fouling **[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]**

**69/00 Equipment for shipping not otherwise provided for [2013.01]**

**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

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**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
11/14 • • • with forced air supply
11/16 • • • with air supply by suction from diver, e.g. snorkels
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

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**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]**

**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

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**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 reciprocatable
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 **[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

**B64C AEROPLANES; HELICOPTERS** (air-cushion vehicles B60V)

**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

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**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 aerials or radomes (aerials 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)
3/48 • • • by relatively-movable parts of wing structures
3/50 • • • by leading or trailing edge flaps (ailerons B64C 9/00)
3/52 • • Warping
3/54 • • Varying in area (flaps extendable to increase camber B64C 3/44)
3/56 • • Folding or collapsing to reduce overall dimensions of aircraft
3/58 • provided with fences or spoilers (adjustable for control purposes B64C 9/00)

**5/00** **Stabilising surfaces** (attaching stabilising surfaces to fuselage B64C 1/26)
5/02 • Tailplanes (fins B64C 5/06)
5/04 • Noseplanes
5/06 • Fins (specially for wings B64C 5/08)
5/08 • mounted on, or supported by, wings
5/10 • adjustable
5/12 • • for retraction against or within fuselage or nacelle
5/14 • • Varying angle of sweep
5/16 • • about spanwise axes
5/18 • • in area

**7/00** **Structures or fairings not otherwise provided for**
7/02 • Nacelles

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**9/00** **Adjustable control surfaces or members, e.g. rudders** (trimming stabilising surfaces B64C 5/10; systems for actuating flying-control surfaces B64C 13/00)
9/02 • Mounting or supporting thereof
9/04 • with compound dependent movements
9/06 • with two or more independent movements
9/08 • bodily displaceable (varying camber of wings B64C 3/44)
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)
9/12 • surfaces of different type or function being simultaneously adjusted
9/14 • forming slots (boundary-layer control B64C 21/00)
9/16 • • at the rear of the wing
9/18 • • • by single flaps
9/20 • • • by multiple flaps
9/22 • • at the front of the wing
9/24 • • • by single flap
9/26 • • • by multiple flaps
9/28 • • by flaps at both the front and rear of the wing operating in unison
9/30 • Balancing hinged surfaces, e.g. dynamically
9/32 • Air braking surfaces (braking by parachutes B64D 17/80)
9/34 • collapsing or retracting against or within other surfaces or other members
9/36 • • the members being fuselages or nacelles
9/38 • Jet flaps

**11/00** **Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft** (rotors specially adapted for rotorcraft B64C 27/32)
11/02 • Hub construction
11/04 • • Blade mountings
11/06 • • • for variable-pitch blades
11/08 • • • for non-adjustable blades
11/10 • • • • rigid
11/12 • • • • flexible
11/14 • • Spinners
11/16 • Blades
11/18 • • Aerodynamic features
11/20 • • Constructional features
11/22 • • • Solid blades
11/24 • • • Hollow blades
11/26 • • • Fabricated blades
11/28 • • • Collapsible or foldable blades
11/30 • Blade pitch-changing mechanisms
11/32 • • mechanical
11/34 • • • automatic
11/36 • • • non-automatic
11/38 • • fluid, e.g. hydraulic
11/40 • • • automatic

11/42 • • • non-automatic
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

**13/00 Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers**
13/02 • Initiating means
13/04 • • actuated personally
13/06 • • • adjustable to suit individual persons
13/08 • • • Trimming zero positions
13/10 • • • comprising warning devices
13/12 • • • Dual control apparatus
13/14 • • • lockable (locking in position to suit individual persons B64C 13/06)
13/16 • • actuated automatically, e.g. responsive to gust detectors
13/18 • • • using automatic pilot (automatic pilots per se G05D 1/00)
13/20 • • • using radiated signals
13/22 • • • readily revertible to personal control
13/24 • Transmitting means
13/26 • • without power amplification or where power amplification is irrelevant
13/28 • • • mechanical
13/30 • • • • using cable, chain, or rod mechanisms
13/32 • • • • using cam mechanisms
13/34 • • • • using toothed gearing
13/36 • • • fluid
13/38 • • with power amplification
13/40 • • • using fluid pressure
13/42 • • • • having duplication or stand-by provisions
13/44 • • • • overriding of personal controls; with automatic return to inoperative position
13/46 • • • • with artificial feel
13/48 • • • • characterised by the fluid being gaseous
13/50 • • • using electrical energy

**15/00 Attitude, flight direction, or altitude control by jet reaction** (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

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**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 (arrester 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 • Arrester 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
27/51 • Damping of blade movements **[3]**
27/52 • Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C 27/43)
27/54 • Mechanisms for controlling blade adjustment or movement relative to rotor head, e.g. lag-lead movement
27/56 • • characterised by the control initiating means, e.g. manually actuated (B64C 27/58 takes precedence)
27/57 • • • automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust **[3]**
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)
27/59 • • • mechanical **[3]**
27/605 • • • • including swash plate, spider or cam mechanisms **[3]**
27/615 • • • • including flaps mounted on blades **[3]**
27/625 • • • • including rotating masses or servo rotors **[3]**
27/635 • • • • specially for controlling lag-lead movements of blades **[3]**
27/64 • • • using fluid pressure, e.g. having fluid power amplification **[3]**
27/68 • • • using electrical energy, e.g. having electrical power amplification **[3]**
27/72 • • Means acting on blades
27/78 • • in association with pitch adjustment of blades of anti-torque rotor
27/80 • • for differential adjustment of blade pitch between two or more lifting rotors
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

**29/00 Aircraft capable of landing or taking-off vertically** (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)
29/02 • having its flight directional axis vertical when grounded
29/04 • • characterised by jet-reaction propulsion

**30/00 Supersonic type aircraft [3]**

**31/00 Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft**
31/02 • Gliders, e.g. sailplanes (hang-gliders B64C 31/028) **[6]**
31/024 • • with auxiliary power plant **[6]**
31/028 • Hang-glider-type aircraft; Microlight-type aircraft **[6]**
31/032 • • having delta shaped wing **[6]**
31/036 • • having parachute-type wing (parachutes B64D 17/00) **[6]**
31/04 • Man-powered aircraft (ornithopters B64C 33/00)
31/06 • Kites (hang-gliders B64C 31/028; toy aspects A63H 27/08; towed targets F41J)

**33/00 Ornithopters**
33/02 • Wings; Actuating mechanisms therefor

**35/00 Flying-boats; Seaplanes** (alighting gear B64C 25/00)
35/02 • Flying-boat hulls **[3]**

**37/00 Convertible aircraft** (vehicles capable of travelling in or on different media B60F)
37/02 • Flying units formed by separate aircraft (towing, air-refuelling, or aircraft-carrying aircraft B64D)

**39/00 Aircraft not otherwise provided for**
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]**

**99/00 Subject matter not provided for in other groups of this subclass [2010.01]**

## 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

**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
bendling 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

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**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 successive 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 successive 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 **[1, 2012.01]**

**Note(s) [2012.01]**

If an invention involves both continuous and intermittent web motion, it is classified in both groups B65B 9/067 and B65B 9/073.

9/067 • • the web advancing continuously (B65B 9/08 takes precedence) **[2012.01]**

9/073 • • the web having intermittent motion (B65B 9/08 takes precedence) **[2012.01]**

9/08 • • in a web folded and sealed transversely to form pockets which are subsequently filled and then closed by sealing **[1, 2012.01]**

**Note(s) [2012.01]**

If an invention involves both continuous and intermittent web motion, it is classified in both groups B65B 9/087 and B65B 9/093.

9/087 • • • the web advancing continuously **[2012.01]**

9/093 • • • the web having intermittent motion **[2012.01]**

9/10 • Enclosing successive 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, 2012.01]**

**Note(s) [2012.01]**

If an invention involves both continuous and intermittent web motion, it is classified in both groups B65B 9/207 and B65B 9/213.

9/207 • • • the web advancing continuously (B65B 9/22 takes precedence) **[2012.01]**

9/213 • • • the web having intermittent motion (B65B 9/22 takes precedence) **[2012.01]**

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 conveyors

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 conveyors

35/28 • • by pneumatic conveyors

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 conveyors

35/48 • • by pneumatic conveyors

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 conveyors
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, conveyors 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 (tabletting 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 polyethene, 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
9/28 • • Air-blast devices
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
9/44 • • • by special means responsive to marks on labels or articles (feed control in wrapping B65B)
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)

**11/00 Manually-controlled or manually-operable label dispensers, e.g. modified for the application of labels to articles** (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)

11/02 • having printing equipment
11/04 • having means for moistening the labels
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

**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 88/00or 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


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**General kinds of rigid or semi-rigid containers [3]**

**1/00 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** (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; rigid pallets with side walls B65D 19/02) **[5]**

1/02 • Bottles or similar containers with necks or like restricted apertures, designed for pouring contents
1/04 • • Multi-cavity bottles
1/06 • • with closable apertures at bottom
1/08 • • adapted to discharge drops (droppers B65D 47/18)
1/09 • Ampoules (specially adapted for medical or pharmaceutical purposes A61J 1/06) **[5]**
1/10 • Jars, e.g. for preserving foodstuffs
1/12 • Cans, casks, barrels, or drums
1/14 • • characterised by shape
1/16 • • • of curved cross-section, e.g. cylindrical
1/18 • • • of polygonal cross-section

1/20 • • characterised by location or arrangement of filling or discharge apertures
1/22 • Boxes or like containers with side walls of substantial depth for enclosing contents
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 (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
1/42 • • Reinforcing or strengthening parts or members
1/44 • • • Corrugations
1/46 • • • Local reinforcements, e.g. adjacent closures
1/48 • • • Reinforcements of dissimilar materials, e.g. metal frames in plastic walls

**3/00 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** (with end walls of different materials B65D 6/00, B65D 8/00)
3/02 • characterised by shape
3/04 • • essentially cylindrical
3/06 • • essentially conical or frusto-conical
3/08 • • having a cross-section of varying shape, e.g. circular merging into square or rectangular
3/10 • characterised by form of integral or permanently-secured end closure
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** (rigid pallets with side walls B65D 19/02; 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
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; rigid pallets with side walls B65D 19/02) **[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; rigid pallets with side walls B65D 19/02) **[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** (rigid pallets with side walls B65D 19/02) **[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** (frangible inner closure members associated with caps, lids or covers B65D 51/20)
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-adjoining 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)

**<u>Details of rigid or semi-rigid containers not otherwise provided for [3]</u>**

**23/00 Details of bottles or jars not otherwise provided for** (screw-threaded or bayonet connections between stoppers or caps and containers B65D 39/08, B65D 41/04, B65D 41/34; closure-securing elements B65D 45/00)
23/02 • Linings or internal coatings
23/04 • Means for mixing or for promoting flow of contents

23/06 • Integral drip catchers or drip-preventing means
23/08 • Coverings or external coatings
23/10 • Handles
23/12 • Means for the attachment of smaller articles
23/14 • • of tags
23/16 • • of thermometers

**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
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

**<u>General kinds of flexible containers [3]</u>**

**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
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]**
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
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
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
35/38 • • • Nozzles
35/40 • • for metering discharge
35/42 • • for preventing loss of removable closure members
35/44 • Closures
35/46 • • with valves
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 • expansible, 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 **[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
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)
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)
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** (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]**

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 **[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

**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

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

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**

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) **[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

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 repellents
81/30 • • by excluding light or other outside radiation
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; for use in connection with the handling of sheets, webs, or filamentary material B65H)

83/02 • for dispensing rod-shaped articles, e.g. needles
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; 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 **[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) **[3]**
88/20 • • with rigid end-walls (B65D 88/18, B65D 88/22 take precedence) **[3]**
88/22 • • specially adapted for transport **[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 (B65D 88/52 takes precedence) **[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) **[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 **[3]**
88/78 • for use in or under water **[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) **[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) **[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 **[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 **[3]**
90/52 • Anti-slosh devices **[3]**
90/54 • Gates or closures (for manholes B65D 90/10; covers or similar closure members, for pressure vessels in general F16J 13/00) **[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)
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 (conveyor 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 conveyor wheels (with screw conveyors B65F 3/22) **[2]**
3/18 • • with endless conveyors, e.g. elevators **[2]**

3/20 • • with charging pistons, plates, or the like (for discharging B65F 3/28) **[2]**
3/22 • • with screw conveyors or 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. CONVEYORS FOR LOADING OR TIPPING, SHOP CONVEYOR SYSTEMS OR PNEUMATIC TUBE CONVEYORS** (packaging B65B; handling thin or filamentary materials, e.g. paper sheets or thread, B65H; cranes B66C; portable or mobile lifting or hauling appliances, e.g. hoists, B66D; devices for lifting or lowering goods for loading or unloading purposes, e.g. fork-lift trucks, B66F 9/00; emptying bottles, jars, cans, casks, barrels or similar containers, not otherwise provided for, B67C 9/00; delivering or transferring liquids B67D; filling or discharging vessels for liquefied, solidified or compressed gases F17C; pipe-line systems for fluids F17D)

***Note(s) [2014.01]***

*This subclass does not cover road or railway vehicles, waterborne vessels or aircraft per se, or their adaptation for transport purposes. This subject matter is covered by classes B60-B64, for example in the following places:*

- *vehicles adapted for load transportation B60P;*
- *railway wagons adapted for load transportation B61D;*
- *hand carts B62B;*
- *superstructures for load-carrying vehicles B62D 33/00;*
- *loading or load-accommodating arrangements on ships or vessels B63B 25/00, B63B 27/00;*
- *equipment for handling freight in aircraft B64D 9/00.*

**Subclass index**

HANDLING AND STORAGE
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Piling, unpiling
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CONVEYORS, CHUTES
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with endless element.....15/00-23/00
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Non-mechanical.....51/00, 53/00, 54/00

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**Storing; Storage devices**

**1/00** **Storing articles, individually or in orderly arrangement, in warehouses or magazines** (conveyor 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)
1/02 • Storage devices (furniture A47B; shop fittings A47F)
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 **[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)
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**

**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** (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
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**

**Chutes; Kinds or types of conveyors; Constructional features, details or auxiliary devices peculiar to conveyors of particular types [4]**

**11/00 Chutes** (used as storage devices B65G 1/02)
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 conveyors comprising load-supporting rollers B65G 17/00; rollers or arrangements thereof B65G 39/00)
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 Conveyors 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)
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
15/20 • • • arranged side by side, e.g. for conveyance of flat articles in vertical position
15/22 • comprising a series of co-operating units
15/24 • • in tandem
15/26 • • extensible, e.g. telescopic
15/28 • Conveyors 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)
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
15/62 • • Guides for sliding belts
15/64 • • for automatically maintaining the position of the belts

**17/00 Conveyors 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 conveyors in which the chains form the load-carrying surface**
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 conveyor 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
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 (drive chains F16G 13/00); 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 Conveyors 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 conveyors**
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 conveyors**
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 conveyors 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)
21/22 • • Rails or the like engaging sliding elements or rollers attached to load-carriers or traction elements

**23/00 Driving gear for endless conveyors; 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 conveyors
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 conveyors
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 conveyors
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 Conveyors 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)
25/02 • the carrier or impeller having different forward and return paths of movement, e.g. walking-beam conveyors
25/04 • the carrier or impeller having identical forward and return paths of movement, e.g. reciprocating conveyors
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 conveyors**
27/02 • comprising helical or spiral channels or conduits for elevation of materials
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 conveyor
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 conveyors, e.g. rotating discs, arms, star-wheels or cones** (mechanical projectors B65G 31/00; screw or rotary spiral conveyors B65G 33/00)
29/02 • for inclined or vertical transit

**31/00 Mechanical throwing machines for articles or solid materials**
31/02 • comprising belts
31/04 • comprising discs, drums, or like rotary impellers

**33/00 Screw or rotary spiral conveyors**
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
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 conveyors not otherwise provided for**
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 conveyors 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 conveyors of the same kind, or of different kinds, of interest apart from their application in particular machines or use in particular manufacturing processes** (series of co-operating belt conveyor units B65G 15/22; series of co-operating chain conveyor units B65G 17/26; sequence control of combined conveyors B65G 43/10)

37/02 • Flow sheets for conveyor combinations in warehouses, magazines or workshops

**Common features or details of, or auxiliary devices applicable to, conveyors of different kinds or types; Feeding or discharging devices incorporated in, or operatively associated with, conveyors**

**39/00 Rollers, e.g. drive rollers, or arrangements thereof incorporated in roller-ways or other types of mechanical conveyors** (driving gear for rollers of roller-ways B65G 13/06)

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
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
39/18 • • • for guiding loads
39/20 • • attached to moving belts or chains

**41/00 Supporting frames or bases for conveyors as a whole, e.g. transportable conveyor frames**

41/02 • Frames mounted on wheels for movement on rail tracks

**43/00 Control devices, e.g. for safety, warning or fault-correcting**

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 conveyors 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 conveyors; Methods employing such devices**

47/02 • Devices for feeding articles or materials to conveyors
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)
47/08 • • • • spacing or grouping the articles during feeding (during transit by conveyor 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 conveyor 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
47/20 • • • • the hoppers or chutes being movable
47/22 • Devices influencing the relative position or the attitude of articles during transit by conveyors (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
47/28 • • • during transit by a single conveyor
47/29 • • • • by temporarily stopping movement
47/30 • • • during transit by a series of conveyors
47/31 • • • • by varying the relative speeds of the conveyors forming the series
47/32 • • • • Applications of transfer devices
47/34 • Devices for discharging articles or materials from conveyors (B65G 47/256 takes precedence)
47/36 • • by detaching suspended articles
47/38 • • by dumping, tripping, or releasing load-carriers
47/40 • • • by tilting conveyor 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)
47/48 • • • according to bodily destination marks on either articles or load-carriers
47/49 • • • • without bodily contact between article or load-carrier and automatic control device
47/50 • • • according to destination signals stored in separate systems

47/51 • • • according to unprogrammed signals, e.g. influenced by supply situation at destination
47/52 • Devices for transferring articles or materials between conveyors, i.e. discharging or feeding devices (loading or unloading by means not incorporated in, or not operatively associated with, conveyors B65G 65/00; transfer of workpieces during metal rolling B21B 41/00)
47/53 • • between conveyors 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 conveyor sections
47/57 • • • for articles
47/58 • • • for materials in bulk
47/60 • • to or from conveyors of the suspended, e.g. trolley, type
47/61 • • • for articles
47/62 • • • for materials in bulk
47/64 • • Switching conveyors
47/66 • • Fixed platforms or combs, e.g. bridges between conveyors
47/68 • • adapted to receive articles arriving in one layer from one conveyor and to transfer them in individual layers to more than one conveyor, or vice versa, e.g. combining the flows of articles conveyed by more than one conveyor
47/69 • • • the articles being accumulated temporarily
47/70 • • • with precedence controls among incoming article flows
47/71 • • • the articles being discharged to several conveyors
47/72 • • transferring materials in bulk from one conveyor to several conveyors 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
47/84 • • Star-shaped wheels or devices having endless travelling belts or chains, the wheels or devices being equipped with article-engaging elements
47/86 • • • the article-engaging elements being grippers
47/88 • • Separating or stopping elements, e.g. fingers (attached to star-shaped wheels B65G 47/84)
47/90 • • Devices for picking-up and depositing articles or materials
47/91 • • • incorporating pneumatic, e.g. suction, grippers
47/92 • • • incorporating electrostatic or magnetic grippers
47/94 • • Devices for flexing or tilting travelling structures; Throw-off carriages
47/95 • • • adapted for longitudinal delivery
47/96 • • • Devices for tilting links or platforms

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**49/00 Conveying systems characterised by their application for specified purposes not otherwise provided for**
49/02 • for conveying workpieces through baths of liquid
49/04 • • the workpieces being immersed and withdrawn by movement in a vertical direction
49/05 • for fragile or damageable materials or articles **[4]**
49/06 • • for fragile sheets, e.g. glass **[4]**
49/07 • • for semiconductor wafers **[5, 2006.01]**
49/08 • • for ceramic mouldings **[4]**

**Non-mechanical conveying through pipes or tubes; Floating in troughs**

**51/00 Conveying articles through pipes or tubes by fluid flow or pressure; Conveying articles over a flat surface, e.g. the base of a trough, by jets located in the surface**
51/01 • Hydraulic transport of articles (B65G 51/04 takes precedence) **[6]**
51/02 • Directly conveying the articles, e.g. slips, sheets, stockings, containers or workpieces, by flowing gases
51/03 • • over a flat surface or in troughs **[4]**
51/04 • Conveying the articles in carriers having a cross-section approximating that of the pipe or tube; Tube mail systems
51/06 • • Despatch carriers for tube mail
51/08 • • Controlling or conditioning the operating medium
51/10 • • • at section junctions of pneumatic systems
51/12 • • • • Pneumatic gates
51/14 • • • • Pneumatic sluices
51/16 • • • varying, e.g. starting or stopping, gas pressure or flow
51/18 • • Adaptations of pipes or tubes; Pipe or tube joints
51/20 • • Braking arrangements
51/22 • • Arrangements for stopping the carriers en route in order to control carrier sequence; Blocking or separating devices
51/24 • • Switches
51/26 • • Stations
51/28 • • • for despatch
51/30 • • • for delivery
51/32 • • • for despatch, delivery, and transit
51/34 • • Two-way operation
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
51/38 • • • Contact devices on interior of tubes for detecting passage of carriers
51/40 • • • Automatically distributing the carriers to desired stations
51/42 • • • • according to indications on carriers
51/44 • • • • • without mechanical contact between carriers and controllers
51/46 • • • • according to separate signal systems

**53/00 Conveying materials in bulk through troughs, pipes or tubes by floating the materials or by flow of gas, liquid or foam**
53/02 • Floating material troughs
53/04 • Conveying materials in bulk pneumatically through pipes or tubes; Air slides
53/06 • • Gas pressure systems operating without fluidisation of the materials
53/08 • • • with mechanical injection of the materials, e.g. by screw
53/10 • • • with pneumatic injection of the materials by the propelling gas
53/12 • • • • the gas flow acting directly on the materials in a reservoir
53/14 • • • • the gas flow inducing feed of the materials by suction effect

53/16 • • Gas pressure systems operating with fluidisation of the materials
53/18 • • • through a porous wall
53/20 • • • • of an air slide, e.g. a trough
53/22 • • • • the systems comprising a reservoir, e.g. a bunker
53/24 • • Gas suction systems
53/26 • • • operating with fluidisation of the materials
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)
53/30 • Conveying materials in bulk through pipes or tubes by liquid pressure
53/32 • Conveying concrete, e.g. for distributing same at building sites (mixing concrete on or by conveyors 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
53/44 • • • Endless conveyors
53/46 • • • Gates or sluices, e.g. rotary wheels
53/48 • • • Screws or like rotary conveyors
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

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**54/00 Non-mechanical conveyors 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; feeding, piling or stacking sheets B65H)
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
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**

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**63/00 Transferring or trans-shipping at storage areas, railway yards or harbours; Marshalling yard installations**
63/02 • with essentially-horizontal transit otherwise than by bridge
63/04 • with essentially-horizontal transit by bridges equipped with conveyors
63/06 • with essentially-vertical transit

**65/00 Loading or unloading** (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 conveyors
65/08 • • with reciprocating pick-up conveyors
65/10 • • • Raking or scraping devices
65/12 • • • • operations at positions off-set from the conveyor centreline
65/14 • • with jigging pick-up conveyors, e.g. duck-bills
65/16 • • with rotary pick-up conveyors
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 unpiling 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

65/34 • • Emptying devices (conveyor 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 conveyors

65/44 • • • • using reciprocating conveyors, e.g. jigging conveyors

65/46 • • • • using screw conveyors

65/48 • • • • using other rotating means, e.g. rotating pressure sluices in pneumatic systems

**67/00** **Loading or unloading vehicles** (by means incorporated in the vehicles B60-B64, e.g. B60P 1/00, B61D 9/00, B63B 27/00, B64D 9/00; ground or aircraft-carrier-deck installations for aircraft B64F 1/32)

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 conveyors

67/10 • • • using conveyors 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

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 conveyors

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)

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

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 (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 **[3]**

**69/00** **Auxiliary measures taken, or devices used, in connection with loading or unloading** (by means incorporated in, or operatively associated with, conveyors B65G 47/00; preventing fire A62C 3/00; in vehicles, see the relevant subclasses, e.g. B60P 1/58, B61D 7/32, B62D 33/00, B63B 25/00, B64D 9/00)

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 in large containers B65D 88/64)

69/10 • Obtaining an average product from stored bulk material

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 (as road or railway equipment B61B 1/00, 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 B61B 1/00, 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 conveyor
   - 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 49/00onwards), 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
WEBS
Feeding
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
Delivery from machines
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
FILAMENTARY MATERIAL
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

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**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

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**13/00 Lifting the ends of piles to facilitate the formation of overlapped piles**

**15/00 Overturning articles [4]**
15/02 • Overturning piles **[4]**

**<u>Feeding webs to or from machines; Winding or unwinding webs; Splicing webs</u>**

**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

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 initating 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. expansible
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**

**81/00** **Methods, apparatus, or devices for covering or wrapping cores by winding webs, tapes, or filamentary material, not otherwise provided for** (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)

81/02 • Covering or wrapping annular or like cores forming a closed or substantially-closed figure

81/04 • • by feeding material obliquely to the axis of the core

81/06 • Covering or wrapping elongated cores

81/08 • • by feeding material obliquely to the axis of the core

**83/00** **Combinations of piling and depiling operations, e.g. performed simultaneously, of interest apart from the single operation of piling or depiling** (B65H 85/00 takes precedence) **[5]**

83/02 • performed on the same pile **[5]**

**85/00** **Recirculating articles, i.e. feeding each article to, and delivering it from, the same machine work-station more than once [5]**

**99/00** **Subject matter not provided for in other groups of this subclass [2006.01]**

# B66 HOISTING; LIFTING; HAULING

**B66B** **ELEVATORS; ESCALATORS OR MOVING WALKWAYS** (life-saving devices used as an alternative to normal egress means, e.g. stairs, during rescue to lower persons in cages, bags, or similar supports from buildings or other structures A62B 1/02; equipment for handling freight or for facilitating passenger embarkation or the like to aircraft B64D 9/00; braking or detent devices characterised by their application to lifting or hoisting gear B66D 5/00) **[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**

**1/00** **Control systems of elevators in general** (safety devices B66B 5/00; controlling door or gate operation B66B 13/00)

1/02 • Control systems without regulation, i.e. without retroactive action

1/04 • • hydraulic

1/06 • • electric

1/08 • • • with devices, e.g. handles or levers, in the cars or cages for direct control of movements

1/10 • • • • specially adapted for mining hoists

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

1/14 • • • with devices, e.g. push-buttons, for indirect control of movements

1/16 • • • • with means for storing pulses controlling the movements of a single car or cage

1/18 • • • • with means for storing pulses controlling the movements of several cars or cages

1/20 • • • • • and for varying the manner of operation to suit particular traffic conditions, e.g. "one-way rush-hour traffic"

1/22 • • • • with means for taking account of delayed calls

1/24 • Control systems with regulation, i.e. with retroactive action, for influencing travelling speed, acceleration, or deceleration

1/26 • • mechanical

1/28 • • electrical (detecting excessive speed B66B 5/04)

1/30 • • • effective on driving gear

1/32 • • • effective on braking devices

1/34 • Details

1/36 • • Means for stopping the cars, cages, or skips at predetermined levels

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
1/48 • • • Adaptations of mechanically-operated limit switches
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
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 lifts in, or associated with, buildings or other structures** (characterised by control systems B66B 1/00)
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
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
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**
13/02 • Door or gate operation
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

**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
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 or unloading equipment
17/16 • • for loading or 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
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)

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**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]**
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) **[4]**

**27/00** **Indicating operating conditions of escalators or moving walkways [4]**

**29/00** **Safety devices of escalators or moving walkways [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]**

**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

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**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 • 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)
17/06 • specially adapted for particular purposes, e.g. in foundries, forges; combined with auxiliary apparatus serving particular purposes (B66C 17/04 takes precedence)
17/08 • • for charging treatment chambers, e.g. furnaces, kilns, ovens (charging furnaces in general F27D 3/00)
17/10 • • for transporting ladles
17/12 • • 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)
17/14 • • • Tong cranes with means for moving article-pushers relative to the tongs
17/16 • • • Tong cranes with means for turning the tongs about a vertical axis

17/18 • • for manipulating workpieces during forging operations (workpiece manipulators in forging machines B21J 13/10)
17/20 • • for hoisting or lowering heavy load carriers, e.g. freight containers, railway wagons
17/22 • • for hoisting or lowering locomotives
17/24 • • for building ships on slipways
17/26 • • combined with auxiliary apparatus, e.g. log saws, pushers for unloading vehicles, means for shunting railway vehicles

**19/00 Cranes comprising trolleys or crabs running on fixed or movable bridges or gantries** (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)
19/02 • collapsible

**21/00 Cable cranes, i.e. comprising hoisting devices running on aerial cable-ways** (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)
21/02 • with cable-ways supported on framework swingably connected to ground-engaging elements
21/04 • with cable-ways supported at one end or both ends on bodily-movable framework, e.g. framework mounted on rail track
21/06 • • 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
21/08 • Sag carriers or rope trolleys, suspended or not, e.g. fixed but offering clearance for travelling gear
21/10 • • travelling

**23/00 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** (base-supporting structures with legs B66C 5/00; adaptations of girders or of track-supporting structures B66C 6/00)

**Note(s)**

Group B66C 23/64 takes precedence over groups B66C 23/02-B66C 23/16.

23/02 • with non-adjustable and non-inclinable jibs mounted solely for slewing movements
23/04 • with jibs the effective length of which is variable in operation, e.g. longitudinally displaceable, extensible
23/06 • with jibs mounted for jibbing or luffing movements
23/08 • • and adapted to move the loads in predetermined paths
23/10 • • • the paths being substantially horizontal; Level-luffing jib cranes
23/12 • • • • with means for automatically varying the effective length of the hoisting rope or cable
23/14 • • • • with means, e.g. pantograph arrangements, for varying jib configuration
23/16 • with jibs supported by columns, e.g. towers having their lower end mounted for slewing movements
23/18 • 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]**
23/20 • • with supporting couples provided by walls of buildings or like structures
23/22 • • • Window cranes, i.e. adapted to be supported in window openings
23/24 • • • Mobile wall cranes
23/26 • • 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]**
23/28 • • • constructed to operate at successively higher levels
23/30 • • • • with frameworks composed of telescopic elements
23/32 • • • • Self-hoisting cranes
23/34 • • • Self-erecting cranes, i.e. with hoisting gear adapted for crane erection purposes
23/36 • • mounted on road or rail vehicles; Manually-movable jib cranes for use in workshops; Floating cranes (vehicle or ship aspects B60-B63)
23/38 • • • with separate prime movers for crane and vehicle
23/40 • • • with a single prime mover for both crane and vehicle
23/42 • • • with jibs of adjustable configuration, e.g. foldable
23/44 • • • Jib cranes adapted for attachment to standard vehicles, e.g. agricultural tractors
23/46 • • • Mobile jib cranes with non-slewable jibs
23/48 • • • Manually-movable jib cranes for use in workshops
23/50 • • • mounted on railway vehicles, e.g. breakdown cranes
23/52 • • • Floating cranes (floating dredgers E02F)
23/53 • • • • 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]**
23/58 • arranged to carry-out a desired sequence of operations automatically, e.g. hoisting followed by luffing and slewing
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

**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

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**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]**
3/35 • • • Inflatable flexible elements, e.g. bellows (inflatable 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]**

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

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**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]**
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

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**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 conveyor-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 10-4 to 10-7 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 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]**

**10/00 Nano-technology for information processing, storage or transmission, e.g. quantum computing or single electron logic [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]**

**20/00 Nano-optics, e.g. quantum optics or photonic crystals [2011.01]**

**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]**