

SECTION B — PERFORMING OPERATIONS; TRANSPORTING

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

Note(s)

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

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

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

Note(s)

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

Subclass index

DEVICES FOR HOLDING BY PRESSING

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

SPANNERS, WRENCHES, OR SCREWDRIVERS

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

OTHER TOOLS FOR FASTENING, CONNECTING, FITTING TOGETHER, SEPARATING, OR

TENSIONING.....	25/00-28/00, 31/00, 33/00
ACCESSORIES.....	29/00

1/00	Vices (specially adapted for tying flies for angling A01K 97/28; specially adapted for machine tools B23Q 3/00) [5]	5/02	• with sliding jaws
1/02	• with sliding jaws	5/04	• with pivoted jaws
1/04	• with pivoted jaws	5/06	• Arrangements for positively actuating jaws
1/06	• Arrangements for positively actuating jaws	5/08	• • using cams
1/08	• • using cams	5/10	• • using screws
1/10	• • using screws	5/12	• • using toggle links
1/12	• • • with provision for disengagement	5/14	• Clamps for work of special profile
1/14	• • using toggle links	5/16	• Details, e.g. jaws, jaw attachments
1/16	• • by pedal, with or without provision for additional manual actuation	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)
1/18	• • motor driven, e.g. with fluid drive, with or without provision for manual actuation	7/02	• Jaws
1/20	• Vices for clamping work of special profile, e.g. pipes	7/04	• • adjustable
1/22	• Arrangements for turning or tilting vices	7/06	• Joints
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)		

B25B

- 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]	27/16	• • abutted flanges
23/16	• Handles (in general B25G)	27/18	• • withdrawing broken threaded parts or twist drills
23/18	• Devices for illuminating the head of the screw or the nut	27/20	• • inserting or withdrawing split pins or circlips
25/00	Implements for fastening, connecting, or tensioning of wire or strip (bundling articles B65B 13/00)	27/22	• • positioning sprocket chains, endless tracks, antiskid chains (tools or implements for repairing chains using metal-working operations B21L 21/00)
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)	27/24	• • mounting or demounting valves (for tyre valves B60C 25/18)
27/02	• for connecting objects by press fit or detaching same	27/26	• • • compressing the springs
27/04	• • inserting or withdrawing keys	27/28	• • positioning or withdrawing resilient bushings or the like [3]
27/06	• • inserting or withdrawing sleeves or bearing races	27/30	• • positioning or withdrawing springs, e.g. coil or leaf springs (B25B 27/26 takes precedence; watchmakers' or watch-repairers' tools G04D) [3]
27/067	• • • employing wedging or impacting means [3]	28/00	Portable power-driven joining or separation tools (B25B 21/00 takes precedence) [3]
27/073	• • • employing screw and nut means [3]	29/00	Accessories (specially for spanners, wrenches, screwdrivers B25B 23/00; tool boxes, tool positioning stands B25H)
27/08	• • inserting or withdrawing cotter pins	29/02	• Bolt tensioners
27/10	• • inserting fittings into hoses	31/00	Hand tools for applying fasteners (nailing or stapling tools B25C) [3]
27/12	• • mounting or demounting piston rings	33/00	Hand tools not covered by any other group in this subclass [3]
27/14	• for assembling objects other than by press fit or detaching same		
B25C	HAND-HELD NAILING OR STAPLING TOOLS; MANUALLY-OPERATED PORTABLE STAPLING TOOLS (manufacturing footwear A43D)		

Note(s)

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

Subclass index

JOINING BY NAILS

Nailing punches.....	9/00
Nailing tools.....	1/00, 3/00, 7/00
Tools for straightening or extracting nails.....	13/00, 11/00
JOINING BY STAPLES.....	5/00, 7/00, 11/00

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]

B25C

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

Subclass index

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

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 (B25D 1/12 takes precedence) [5]
- 1/12 • having shock-absorbing means [5]
- 1/14 • having plural striking faces [5]
- 1/16 • having the impacting head in the form of a sleeve slidable on a shaft, e.g. hammers for driving a valve or draw-off tube into a barrel [5]

- 9/18 • • • involving a piston-type slide valve
- 9/20 • • • involving a tubular-type slide valve
- 9/22 • • • involving a rotary-type slide valve
- 9/24 • • • involving a rocking-plate type valve
- 9/26 • • Control devices for adjusting the stroke of the piston or the force or frequency of impact thereof

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

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

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

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

5/00 Centre punches

- 5/02 • Automatic centre punches

7/00 Picks (combined with other tools B25F)

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

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

- 9/02 • of the tool-carrier piston type, i.e. in which the tool is connected to an impulse member
- 9/04 • of the hammer piston type, i.e. in which the tool bit or anvil is hit by an impulse member
- 9/06 • Means for driving the impulse member
- 9/08 • • comprising a built-in air compressor
- 9/10 • • comprising a built-in internal-combustion engine
- 9/11 • • operated by combustion pressure generated by detonation of a cartridge
- 9/12 • • comprising a built-in liquid motor
- 9/14 • Control devices for the reciprocating piston
- 9/16 • • Valve arrangements therefor

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

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

- 17/02 • Percussive tool bits (drill bits for earth drilling E21B 10/00)
- 17/04 • Handles; Handle mountings
- 17/06 • Hammer pistons; Anvils
- 17/08 • Means for retaining and guiding the tool bit, e.g. chucks
- 17/10 • Safety devices (in general F16P)
- 17/11 • Arrangements of noise damping means (noise damping in general G10K 11/16) [3]
- 17/12 • • of exhaust silencers [3]

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|-------|--|-------|---|
| 17/14 | • Removing or laying dust (flushing boreholes while drilling earth or rock E21B 21/00) | 17/24 | • Damping the reaction force |
| 17/16 | • • by liquid | 17/26 | • Lubricating (in general F16N) |
| 17/18 | • • by exhausting dust-loaded air | 17/28 | • Supports; Devices for holding power-driven percussive tools in working position |
| 17/20 | • Devices for cleaning or cooling tool or work | 17/30 | • • Pillars and struts |
| 17/22 | • • using pressure fluid | 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.

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|-------------|--|-------------|---|
| 1/00 | Combination or multi-purpose hand tools
(associations of tools for different working operations with one portable power-drive means B25F 3/00) | 3/00 | Associations of tools for different working operations with one portable power-drive means; Adapters therefor |
| 1/02 | • with interchangeable or adjustable tool elements | 5/00 | Details or components of portable power-driven tools not particularly related to the operations performed and not otherwise provided for [4] |
| 1/04 | • • wherein the elements are brought into working position by a pivoting or sliding movement | 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)

- This subclass covers:
 - handles for hand implements, in general;
 - handles for hand implements for particular purposes, subject to Note (2) below.
- 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 | 3/12 | • • Locking or securing devices |
| 1/01 | • Shock-absorbing means (B25G 1/02 takes precedence) [5] | 3/14 | • • • comprising barbs or teeth |
| 1/02 | • flexible (hammers heads having shock-absorbing means B25D 1/12) [5] | 3/16 | • • • comprising bayonet joints |
| 1/04 | • telescopic; extensible; sectional | 3/18 | • • • comprising catches or pawls |
| 1/06 | • reversible or adjustable for position | 3/20 | • • • comprising clamping or contracting means acting concentrically on the handle or socket |
| 1/08 | • with provision for storing tool elements | 3/22 | • • • • Chucks |
| 1/10 | • characterised by material or shape (B25G 1/01, B25G 1/02 take precedence) [5] | 3/24 | • • • comprising clamping or contracting means acting transversely on the handle or socket |
| 1/12 | • • electrically insulating material [2] | 3/26 | • • • comprising nails, screws, bolts, or pins traversing or entering the socket |
| 3/00 | Attaching handles to the implements | 3/28 | • • • comprising wedges, keys, or like expanding means |
| 3/02 | • Socket, tang, or like fixings (B25G 3/34 takes precedence) | 3/30 | • • • comprising screwed sockets or tangs |
| 3/04 | • • with detachable or separate socket pieces (B25G 3/12 takes precedence) | 3/32 | • • • in association with, or including, tang, bolt, or other member passing axially through whole length of handle |
| 3/06 | • • with multiple socket, e.g. T-socket (B25G 3/12 takes precedence) | 3/34 | • by pressing the handle on the implements; using cement or molten metal, e.g. casting, moulding; by welding or the like |
| 3/08 | • • with dovetail or other groove (B25G 3/12 takes precedence) | 3/36 | • Lap joints; Riveted, screwed, or like joints (socket, tang, or like fixings B25G 3/02) |
| 3/10 | • • with elastic, taper, or other self-grip socket or tang (B25G 3/12 takes precedence) | 3/38 | • Hinged, pivoted, swivelling, or folding joints |

B25G

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

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

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

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

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

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

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

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

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

Note(s)

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

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

Subclass index

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

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

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

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

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

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

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

7/00 Micromanipulators

9/00 Programme-controlled manipulators

- 9/02 • characterised by movement of the arms, e.g. cartesian co-ordinate type (B25J 9/06 takes precedence) [4]
- 9/04 • • by rotating at least one arm, excluding the head movement itself, e.g. cylindrical co-ordinate type or polar co-ordinate type [4]

- 9/06 • characterised by multi-articulated arms [4]
- 9/08 • characterised by modular constructions [4]
- 9/10 • characterised by positioning means for manipulator elements [4]
- 9/12 • • electric [4]
- 9/14 • • fluid [4]
- 9/16 • Programme controls (total factory control, i.e. centrally controlling a plurality of machines, G05B 19/418) [4]
- 9/18 • • electric [4]
- 9/20 • • fluidic [4]
- 9/22 • • Recording or playback systems (in general G05B 19/42) [4]

- 11/00 Manipulators not otherwise provided for**

- 13/00 Controls for manipulators** (programme controls B25J 9/16) [4]
- 13/02 • Hand grip control means
- 13/04 • Foot-operated control means
- 13/06 • Control stands, e.g. consoles, switchboards
- 13/08 • by means of sensing devices, e.g. viewing or touching devices [4]

- 15/00 Gripping heads**
- 15/02 • servo-actuated
- 15/04 • with provision for the remote detachment or exchange of the head or parts thereof

- 15/06 • with vacuum or magnetic holding means
- 15/08 • having finger members (B25J 15/02, B25J 15/04 take precedence) [4]
- 15/10 • • with three or more finger members [4]
- 15/12 • • with flexible finger members [4]

- 17/00 Joints**
- 17/02 • Wrist joints

- 18/00 Arms [4]**
- 18/02 • extensible [4]
- 18/04 • • rotatable [4]
- 18/06 • flexible [4]

- 19/00 Accessories fitted to manipulators, e.g. for monitoring, for viewing; Safety devices combined with or specially adapted for use in connection with manipulators** (safety devices in general F16P; protection against radiation in general G21F)
- 19/02 • Sensing devices [4]
- 19/04 • • Viewing devices [4]
- 19/06 • Safety devices [4]

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