**CPC**  COOPERATIVE PATENT CLASSIFICATION

**B**  PERFORMING OPERATIONS; TRANSPORTING

**(NOTES omitted)**

**SHAPING**

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

**(NOTES omitted)**

**B23B**  TURNING; BORING (arrangements for copying or controlling **B23Q**)

**WARNINGS**

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

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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 B04D 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)

#### 3/065

- [Arrangements for performing other machining operations, e.g. milling, drilling]

#### 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 ( для faceplates B23Q 1/50)

#### 3/16

- Turret lathes for turning individually-chucked workpieces ( для turret B23B 29/24)

#### 3/161

- [Lathe with one toolslide carrying one turret head]

#### 3/162

- [Arrangements for performing other machining operations, e.g. milling, drilling]

#### 3/164

- [Lathe with one toolslide carrying two or more turret heads]

#### 3/165

- [Arrangements for performing other machining operations, e.g. milling, drilling]

#### 3/167

- [Lathe with two or more toolslides carrying turrets]

#### 3/168

- [Arrangements for performing other machining operations, e.g. milling, drilling]

#### 3/22

- Turning-machines or devices with rotary tool heads (B23B 5/08, B23B 5/14 and B23B 5/16 take precedence)

#### 3/24

- the tools of which do not perform a radial movement; Rotary tool head therefor

#### 3/26

- the tools of which perform a radial movement; Rotary tool head therefor

#### 3/265

- [Surfacing or grooving flanges]

#### 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 (for turning conical surfaces in general B23B 5/38; tools for working valve seats B23B 51/106)

#### 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 (otherwise than by turning B23D 79/12)

#### 5/14

- Cutting-off lathes (B23D 21/00 takes precedence) shearing B23D)

#### 5/16

- for bevelling, chamfering, or deburring the ends of bars or tubes

#### 5/161

- [Devices attached to the workpiece]

#### 5/162

- [with an internal clamping device]

#### 5/163

- [with an external clamping device]

#### 5/165

- [Workpieces clamped on a bench, e.g. a vice]

#### 5/166

- [Devices for working electrodes]

#### 5/167

- [Tools for chamfering the ends of bars or tubes]

#### 5/168

- [with guiding devices]

#### 5/18

- for turning crankshafts, eccentrics, or cams, e.g. crankpin lathes

#### 5/20

- without removing same from the engine

#### 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

#### 5/32

- for reconditioning wheel sets without removing same from the vehicle; Underfloor wheel lathes for railway vehicles

#### 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

#### 5/365

- [For toroidal surfaces]

#### 5/38

- for turning conical surfaces inside or outside, e.g. taper pins (for turning valves or valve bodies B23B 5/06)

#### 5/40

- for turning spherical surfaces inside or outside

#### 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 (arrangements or accessories for enabling machine tools not specially designed only for thread cutting to be used for this purpose B23G 3/00)]

#### 7/02

- Automatic or semi-automatic machines for turning of stock
Turning

13/00 Arrangements for automatically conveying or chucking or guiding stock

13/02 . . . for turning-machines with a single working-spindle
13/02/01 . . . (Feeding device having intermittent movement)
13/02/02 . . . . (being placed in the spindle)
13/02/04 . . . . (including two collets)
13/02/05 . . . (with stock drum)
13/02/07 . . . (Feeding by pistons under fluid-pressure)
13/02/08 . . . . (the material being fed from a reel)
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
13/12/01 . . . (Stops (stops for equipment for precise positioning of tool or work into particular locations not otherwise provided for B23Q 16/00))
13/12/03 . . . (Grippers, pushers or guiding tubes
(arrangements for reducing vibrations in feeding-passages or for damping noise B23B 13/08))
13/12/05 . . . {Feed collets (feeding device having intermittent movement being placed in the spindle including two collets B23B 13/024; collet chucks B23B 31/20})
13/12/06 . . [Supports]
13/12/08 . . [Stock rest handling devices, e.g. ejectors]

Components or accessories particularly for turning-machines

23/00 Tailstocks; Centres ((for grinding machines B24B 41/062)
23/00/05 . . (the centres being adjustable)
23/02 . . Dead centres
23/02/25 . . (the centres being adjustable)
23/04 . . Live centres
23/04/05 . . (the centres being adjustable)

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 (B23Q 11/08 takes precedence;) 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)
25/06/05 . . . (Tool setting height gauges)

27/00 Tools for turning or boring machines (for drilling machines B23B 51/00); Tools of a similar kind in general; Accessories therefor

NOTE all subgroups except B23B 27/12 relate to tools with a shank
27/00/02 . . (with vibration damping means)
27/00/05 . . (Geometry of the chip-forming or the clearance planes, e.g. tool angles (B23B 27/141 and B23B 27/22 take precedence))
27/00/07 . . (for internal turning (boring bars B23B 29/02; boring heads B23B 29/03; milling cutters B23C 5/00; reamers B23D 77/00))
27/02 . . Cutting tools with straight main part and cutting edge at an angle (B23B 27/04 - B23B 27/08 take precedence)
27/04/04 . . (Cutting-off tools (B23B 27/08 takes precedence (; toolholders for cutting-off inserts B23B 29/042))
27/04/05 . . . (with chip-breaking arrangements)
27/06 . . Profile cutting tools, i.e. forming-tools
27/06/05 . . . (Thread-turning tools)
27/08 . . Cutting tools with blade- or disc-like main parts ([with disc-like main parts B23B 27/083])
27/08/03 . . . (Cutting tools with disc-like main parts]
27/08/06 . . . (with yieldable support for the cutting insert)
27/10 . . Cutting tools with special provision for cooling ([drills with lubricating or cooling equipment B23B 51/06; features relating to lubricating or cooling of milling cutters B23C 5/28; arrangements or devices for cooling or lubricating tools or work B23Q 11/10])
27/12 . . . with a continuously-rotated circular cutting edge;
27/14 . . . Holders therefor
27/14 . . Cutting tools of which the bits or tips [or cutting inserts] are of special material
Components or accessories particularly for turning machines

27/141 . . . [Specially shaped plate-like cutting inserts, i.e. length greater or equal to width, width greater than or equal to thickness (with specially shaped plate-like exchangeable cutting inserts, e.g. chip-breaking groove, B23B 27/1603; with removable plate-like milling cutting inserts of special shape B23C 5/202)]

27/143 . . . [characterised by having chip-breakers]
27/145 . . . [characterised by having a special shape]
27/146 . . . [Means to improve the adhesion between the substrate and the coating]
27/148 . . . [Composition of the cutting inserts]
27/16 . . . with exchangeable cutting bits {or cutting inserts}, e.g. able to be clamped
27/1603 . . . [with specially shaped plate-like exchangeable cutting inserts, e.g. chip-breaking groove (B23B 27/1614 - B23B 27/1655 take precedence)]

27/1607 . . . [characterised by having chip-breakers]
27/1611 . . . [characterised by having a special shape]
27/1614 . . . [with plate-like cutting inserts of special shape clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the insert (B23B 27/1644 takes precedence)]
27/1618 . . . [characterised by having chip-breakers]
27/1622 . . . [characterised by having a special shape]
27/1625 . . . [with plate-like cutting inserts of special shape clamped by a clamping member acting almost perpendicularly on the chip-forming plane (B23B 27/1644 takes precedence)]
27/1629 . . . [in which the clamping member breaks the chips]
27/1633 . . . [in which the chip-breaking clamping member is adjustable]
27/1637 . . . [characterised by having chip-breakers]
27/164 . . . [characterised by having a special shape]
27/1644 . . . [with plate-like cutting inserts of special shape clamped by a clamping member acting almost perpendicularly on the chip-forming plane and at the same time upon the wall of a hole in the cutting insert]
27/1648 . . . [characterised by having chip-breakers]
27/1651 . . . [characterised by having a special shape]
27/1655 . . . [Adjustable position of the plate-like cutting inserts of special form]
27/1659 . . . [with plate-like exchangeable cutting inserts (B23B 27/1662 - B23B 27/1681 take precedence)]
27/1662 . . . [with plate-like cutting inserts clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the cutting insert (B23B 27/1677 takes precedence)]
27/1666 . . . [with plate-like cutting inserts clamped by a clamping member acting almost perpendicularly on chip-forming plane (B23B 27/1677 takes precedence)]
27/167 . . . [in which the clamping member breaks the chips]
27/1674 . . . [in which the chip-breaking clamping member is adjustable]

27/1677 . . . [with plate-like cutting inserts clamped by a clamping member acting almost perpendicularly on the chip-forming plane and at the same time upon the wall of a hole in the insert]
27/1681 . . . [Adjustable position of the plate-like cutting inserts]
27/1685 . . . [Adjustable position of the cutting inserts (B23B 27/1655 and B23B 27/1681 take precedence)]
27/1688 . . . [Height of the cutting tip adjustable]
27/1692 . . . [Angular position of the cutting insert adjustable around an axis parallel to the chip-forming plane]
27/1696 . . . [Angular position of the cutting insert adjustable around an axis generally perpendicularly to the chip-forming plane]
27/18 . . . with cutting bits or tips {or cutting inserts} rigidly mounted, e.g. by brazing
27/20 . . . with diamond bits {or cutting inserts}
27/22 . . . Cutting tools with chip-breaking equipment { (B23B 27/045, B23B 27/143, B23B 27/16 take precedence; arrangements for chip-breaking B23B 25/02; for milling tools B23C 5/165)}
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
29/022 . . . [with vibration reducing means]
29/025 . . . [Boring toolholders fixed on the boring bar]
29/027 . . . [Steadies for boring bars (auxiliary devices, e.g. steadies, rests B23Q 1/76)]
29/03 . . . Boring heads
29/034 . . . [with tools moving radially, e.g. for making chamfers or undercuts]
29/03403 . . . [radially adjustable before starting manufacturing]
29/03407 . . . [by means of screws and nuts]
29/0341 . . . [Cartridges]
29/03414 . . . [adjustment of the tool placed in the hole being possible]
29/03417 . . . [by means of inclined planes]
29/03421 . . . [by pivoting the tool carriers or by elastic deformation]
29/03425 . . . [by means of gears and racks]
29/03428 . . . [by means of an eccentric]
29/03432 . . . [radially adjustable during manufacturing]
29/03435 . . . [by means of screws and nuts]
29/03439 . . . [Boring and facing heads]
29/03442 . . . [Grooving tool]
29/03446 . . . [by means of inclined planes]
29/0345 . . . [Boring and facing heads]
29/03453 . . . [Grooving tool]
29/03457 . . . [by pivoting the tool carriers or by elastic deformation]
29/0346 . . . [Boring and facing heads]
29/03464 . . . [Grooving tool]
29/03467 . . . [by means of gears and racks]
29/03471 . . . [Boring and facing heads]
29/03475 . . . [Grooving tool]
29/03478 . . . [by means of an eccentric]
29/03482 . . . [Boring and facing heads]
Components or accessories particularly for turning machines

29/03485 . . . . . . . [Grooving tool]
29/03489 . . . . . . . [Adjustment means not specified or not covered by the groups B23B 29/03435 - B23B 29/03478]
29/03492 . . . . . . . [Boring and facing heads]
29/03496 . . . . . . . [Grooving tool]
29/04 . . . Tool holders for a single cutting tool
29/043 . . . . . . . [with cutting-off, grooving or profile cutting tools, i.e. blade- or disc-like main cutting parts (B23B 29/14 takes precedence)]
29/046 . . . . . . . [with an intermediary toolholder]
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
29/125 . . . . . . . [Vibratory toolholders]
29/14 . . . . . . . affording a yielding support of the cutting tool, e.g. by spring clamping (cutting tools with yieldable support for the cutting insert B23B 27/086)
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
29/205 . . . . . . . [the tools being adjustable]
29/22 . . . . . . . for tool adjustment by means of shims or spacers
29/24 . . . Tool holders for a plurality of cutting tools, e.g. turrets (indexing devices B23Q 16/00)
29/242 . . . . . . . [Turrets, without description of the angular positioning device (turret lathes for turning individually-chucked workpieces B23B 3/16; turrets with manually operated angular positioning devices B23B 29/282; turrets with power operated angular positioning devices B23B 29/323)]
29/244 . . . . . . . [Toolposts, i.e. clamping quick-change toolholders, without description of the angular positioning device (toolposts with manually operated angular positioning devices B23B 29/285; toolposts with power operated angular positioning devices B23B 29/326)]
29/246 . . . . . . . [Quick-change tool holders]
29/248 . . . . . . . [with individually adjustable toolholders]
29/26 . . . . . . . Tool holders in fixed position
29/28 . . . . . . . Turrets manually adjustable about a vertical (or horizontal) pivot (indexing devices B23Q 16/00)
29/282 . . . . . . . [Turrets with manually operated angular positioning devices]
29/285 . . . . . . . [Toolposts with manually operated angular positioning devices]
29/287 . . . . . . . [Turret toolholder with manually operated angular positioning devices]
29/32 . . . . . . . Turrets adjustable by power drive, i.e. turret heads (indexing devices B23Q 16/00)
29/323 . . . . . . . [Turrets with power operated angular positioning devices]
29/326 . . . . . . . [Toolposts with power operated angular positioning devices]
29/34 . . . . . . . Turrets equipped with triggers for releasing the cutting tools
31/00 . . . . . . . Chucks (allowing axial oscillation of percussion tool bits B25D 17/08); Expansion mandrels; Adaptations thereof for remote control (faceplates B23Q 1/50; devices for securing work or tools to spindles in general B23Q 3/12; rotary devices holding by magnetic and/or electrical force acting directly on work B23Q 3/152)
31/001 . . . . . . . [Protection against entering of chips or dust]
31/003 . . . . . . . [Work or tool ejection means]
31/005 . . . . . . . [Cylindrical shanks of tools]
31/006 . . . . . . . [Conical shanks of tools]
31/008 . . . . . . . [with arrangements for transmitting torque]
31/002 . . . . . . . Chucks
31/021 . . . . . . . [Faceplates]
31/023 . . . . . . . [for screw-threads]
31/025 . . . . . . . [for gears]
31/026 . . . . . . . [the radial or angular position of the tool being adjustable (boring heads with tools moving radially B23B 29/034; holding tools yieldably B23B 31/08; with means for adjusting the chuck with respect to the working spindle B23B 31/36)]
31/028 . . . . . . . [the axial positioning of the tool being adjustable (B23B 31/208 takes precedence; with means for adjusting the chuck with respect to the working spindle B23B 31/36)]
31/06 . . . . . . . Features relating to the removal of tools; Accessories therefor
31/07 . . . . . . . Ejector wedges
31/08 . . . . . . . holding tools yieldably
31/083 . . . . . . . [axially]
31/086 . . . . . . . [having an overload clutch]
31/10 . . . . . . . characterised by the retaining or gripping devices or their immediate operating means

NOTE
Group B23B 31/12 takes precedence over groups [B23B 31/101, B23B 31/102, B23B 31/103 - B23B 31/117]

31/101 . . . . . . . [Chucks with separately-acting jaws movable radially (B23B 31/1602; B23B 31/16062, B23B 31/161, B23B 31/16137, B23B 31/16175, B23B 31/16212, B23B 31/1625 and B23B 31/16283 take precedence; chucks with simultaneously-acting jaws moving radially B23B 31/16)]
31/102 . . . . . . . [Jaws, accessories or adjustment means B23B 31/16008, B23B 31/1605, B23B 31/16087, B23B 31/16125, B23B 31/16162, B23B 31/162, B23B 31/16237, B23B 31/1627 take precedence)]
31/103 . . . . . . . Retention by pivotal elements, e.g. catches, pawls
31/107 . . . . . . . Retention by laterally-acting detents, e.g. pins, screws, wedges; Retention by loose elements, e.g. balls
31/1071 . . . . . . . [Retention by balls (balls acting as jaws B23B 31/22)]
31/1072 . . . . . . . [Retention by cylindrical elements (cylindrical elements acting as jaws B23B 31/22)]
Components or accessories particularly for turning machines

31/1073 . . . . . . {Retention by conical elements (conical elements acting as jaws B23B 31/22)}
31/1074 . . . . . . {Retention by pins}
31/1075 . . . . . . {Retention by screws}
31/1076 . . . . . . {with conical ends}
31/1077 . . . . . . {acting on a floating pin}
31/1078 . . . . . . {Retention by wedges}
31/11 . . . . . . Retention by threaded connection
31/1107 . . . . . . {for conical parts}
31/1115 . . . . . . {using conical threads}
31/1122 . . . . . . {using cylindrical threads}
31/113 . . . . . . Retention by bayonet connection
31/117 . . . . . . Retention by friction only, e.g. using springs, resilient sleeves, tapers
31/1171 . . . . . . {not used, see subgroups and B23B 31/117}
31/1172 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1173 . . . . . . {using springs}
31/1174 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1175 . . . . . . {using elastomer rings or sleeves}
31/1176 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1177 . . . . . . {using resilient metallic rings or sleeves}
31/1178 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1179 . . . . . . {using heating and cooling}
31/12 . . . . . . Chucks with simultaneously-acting jaws, whether or not also individually adjustable
31/1207 . . . . . . {moving obliquely to the axis of the chuck in a plane containing this axis}
31/1215 . . . . . . {Details of the jaws}
31/1223 . . . . . . {using fluid-pressure means in the chuck to actuate the gripping means}
31/123 . . . . . . {with locking arrangements (locking arrangements for chucks with simultaneously-acting jaws moving radially actuated by one or more spiral grooves B23B 31/16041)}
31/1238 . . . . . . {Jaws movement actuated by a nut with conical screw-thread}
31/1246 . . . . . . {Jaws movement actuated by a bolt with conical screw-thread}
31/1253 . . . . . . {Jaws movement actuated by an axially movable member}
31/1261 . . . . . . {pivotally movable in a radial plane}
31/1269 . . . . . . {Details of the jaws}
31/1276 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1284 . . . . . . {with a centre}
31/1292 . . . . . . {using mechanical transmission through the spindle}
31/14 . . . . . . involving the use of a centrifugal force
31/16 . . . . . . moving radially
31/16004 . . . . . . {Jaws movement actuated by one or more spiral grooves}
31/16008 . . . . . . {Details of the jaws}
31/16012 . . . . . . {Form of the jaws}
31/16016 . . . . . . {Fixation on the master jaw}
31/1602 . . . . . . {Individually adjustable jaws}
31/16025 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/16029 . . . . . . {using mechanical transmission through the spindle}
31/16033 . . . . . . {with a centre}
31/16037 . . . . . . {using mechanical transmission through the spindle (B23B 31/16029 takes precedence)}
31/16041 . . . . . . {with locking arrangements (locking arrangements for chucks with simultaneously-acting jaws moving obliquely to the axis of the chuck in a plane containing this axis B23B 31/123)}
31/16045 . . . . . . {Jaws movement actuated by screws and nuts or oblique racks}
31/1605 . . . . . . {Details of the jaws}
31/16054 . . . . . . {Form of the jaws}
31/16058 . . . . . . {Fixation on the master jaw}
31/16062 . . . . . . {Individually adjustable jaws}
31/16066 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/1607 . . . . . . {using mechanical transmission through the spindle}
31/16075 . . . . . . {with a centre}
31/16079 . . . . . . {using mechanical transmission through the spindle (B23B 31/1607 takes precedence)}
31/16083 . . . . . . {Jaws movement actuated by gears and racks}
31/16087 . . . . . . {Details of the jaws}
31/16091 . . . . . . {Form of the jaws}
31/16095 . . . . . . {Fixation on the master jaw}
31/161 . . . . . . {Individually adjustable jaws}
31/16104 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/16108 . . . . . . {using mechanical transmission through the spindle}
31/16112 . . . . . . {with a centre}
31/16116 . . . . . . {using mechanical transmission through the spindle (B23B 31/16108 takes precedence)}
31/1612 . . . . . . {Jaws movement actuated by cam surface in a radial plane}
31/16125 . . . . . . {Details of the jaws}
31/16129 . . . . . . {Form of the jaws}
31/16133 . . . . . . {Fixation on the master jaw}
31/16137 . . . . . . {Individually adjustable jaws}
31/16141 . . . . . . {using fluid-pressure means to actuate the gripping means}
31/16145 . . . . . . {using mechanical transmission through the spindle}
31/1615 . . . . . . {with a centre}
31/16154 . . . . . . {using mechanical transmission through the spindle (B23B 31/16145 takes precedence)}
31/16158 . . . . . . {Jaws movement actuated by coaxial conical surfaces}
31/16162 . . . . . . {Details of the jaws}
31/16166 . . . . . . {Form of the jaws}
31/1617 . . . . . . {Fixation on the master jaw}
31/16175 . . . . . . {Individually adjustable jaws}
31/16179 . . . . . . {using fluid-pressure means to actuate the gripping means}
Components or accessories particularly for turning machines

31/16183 . . . . . . [using mechanical transmission through the spindle]
31/16187 . . . . . . [with a centre]
31/16191 . . . . . . [using mechanical transmission through the spindle (B23B 31/16183 takes precedence)]
31/16195 . . . . . . (Jaws movement actuated by levers moved by a coaxial control rod)
31/162 . . . . . . [Details of the jaws]
31/16204 . . . . . . [Form of the jaws]
31/16208 . . . . . . [Fixation on the master jaw]
31/16212 . . . . . . [Individually adjustable jaws]
31/16216 . . . . . . [using fluid-pressure means to actuate the gripping means]
31/1622 . . . . . . [using mechanical transmission through the spindle]
31/16225 . . . . . . [with a centre]
31/16229 . . . . . . [using mechanical transmission through the spindle (B23B 31/1622 takes precedence)]
31/16233 . . . . . . (Jaws movement actuated by oblique surfaces of a coaxial control rod)
31/16237 . . . . . . [Details of the jaws]
31/16241 . . . . . . [Form of the jaws]
31/16245 . . . . . . [Fixation on the master jaw]
31/1625 . . . . . . . [Individually adjustable jaws]
31/16254 . . . . . . [using fluid-pressure means to actuate the gripping means]
31/16258 . . . . . . [using mechanical transmission through the spindle]
31/16262 . . . . . . [with a centre]
31/16266 . . . . . . [using mechanical transmission through the spindle (B23B 31/16258 takes precedence)]
31/1627 . . . . . . [Details of the jaws]
31/16275 . . . . . . [Form of the jaws]
31/16279 . . . . . . [Fixation on the master jaw]
31/16283 . . . . . . [Individually adjustable jaws]
31/16287 . . . . . . [using fluid-pressure means to actuate the gripping means]
31/16291 . . . . . . . [with a centre]
31/16295 . . . . . . . [with means preventing the ejection of the jaws]
31/18 . . . . . . pivotally movable in planes containing the axis of the chuck
31/185 . . . . . . (moving first parallel to the axis then pivotally in planes containing the axis of the chuck)
31/19 . . . . . . moving parallel to the axis of the chuck (B23B 31/185 takes precedence)
31/20 . . . . . . Longitudinally-split sleeves, e.g. collet chucks
31/201 . . . . . . (characterised by features relating primarily to remote control of the gripping means)
31/202 . . . . . . [Details of the jaws]
31/204 . . . . . . [using fluid-pressure means to actuate the gripping means]
31/205 . . . . . . [using mechanical transmission through the spindle]
31/207 . . . . . . [using mechanical transmission through the spindle (B23B 31/205 takes precedence)]
31/208 . . . . . . [with a tool positioning stop (axial positioning of the tool being adjustable B23B 31/028)]
31/22 . . . . . . Jaws in the form of balls (retention by balls B23B 31/1071)
31/223 . . . . . . (Jaws in the form of cylindrical elements (retention by cylindrical elements B23B 31/1072))
31/226 . . . . . . (Jaws in the form of conical elements (retention by conical elements B23B 31/1073))
31/24 . . . . characterised by features relating primarily to remote control of the gripping means (B23B 31/201 takes precedence)
31/26 . . . . using mechanical transmission through the working-spindle (B23B 31/16 and B23B 31/40 take precedence)
31/261 . . . . . . [clamping the end of the toolholder shank]
31/263 . . . . . . [by means of balls]
31/265 . . . . . . [by means of collets]
31/266 . . . . . . [using a threaded spindle]
31/268 . . . . . . [using a bayonet connection]
31/28 . . . . using electric or magnetic means in the chuck
31/30 . . . . using fluid-pressure means in the chuck (B23B 31/10 and B23B 31/40 take precedence)
31/302 . . . . . . [Hydraulic equipment, e.g. pistons, valves, rotary joints]
31/305 . . . . . . [the gripping means is a deformable sleeve]
31/307 . . . . . . [Vacuum chucks]
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 (B23B 31/086 takes precedence)
31/39 . . . . Jaw changers
31/40 . . . . Expansion mandrels
31/4006 . . . . (Gripping the work or tool by a split sleeve (collet chucks B23B 31/20))
31/4013 . . . . [Details of the jaws]
31/402 . . . . [using fluid-pressure means to actuate the gripping means]
31/4026 . . . . [using mechanical transmission through the spindle]
31/403 . . . . [using mechanical transmission through the spindle (B23B 31/4026 takes precedence)]
31/404 . . . . (Gripping the work or tool by jaws moving radially controlled by conical surfaces (see also B23B 31/16158))
31/4046 . . . . [Details of the jaws]
31/4053 . . . . [using fluid-pressure means to actuate the gripping means]
31/406 . . . . [using mechanical transmission through the spindle]
31/4066 . . . . [using mechanical transmission through the spindle (B23B 31/406 takes precedence)]
31/4073 . . . . (Gripping the work or tool between planes almost perpendicular to the axis)
31/408 . . . . [Work or tool supported by two conical surfaces]
31/4086 . . . . [Work or tool gripped by a roller movable on an inclined plane]
31/4093 . . . . (Tube supporting means including a centerhole)
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

33/005 . . [Drivers with driving pins or the like]

**Boring; Drilling** (for surgical purposes A61B 17/16; in metal using electric current B23H 9/14; by laser beam B23K 26/00; earth or rock drilling E21B)

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

35/005 . . [Measures for preventing splitting]

37/00 Boring by making use of ultrasonic energy (essentially using abrasive material B24B, e.g. B24B 1/04)

39/00 General-purpose boring or drilling machines or devices; Sets of boring and/or drilling machines

39/003 . . [Drilling machine situated underneath the workpiece]

39/006 . . [Portal 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

39/161 . . . [with parallel work spindles]

39/162 . . . . [having gear transmissions]

39/163 . . . . [having crank pin transmissions]

39/165 . . . . [having universal joint transmissions]

39/166 . . . . [having flexible shaft transmissions]

39/167 . . . . [having belt and chain transmissions]

39/168 . . . . [with the work spindles being oblique to each other]

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

39/205 . . . [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 ([surgical drilling machines A61B 17/16]); Accessories specially adapted therefor

41/003 . . [for drilling elongated pieces, e.g. beams]

41/006 . . . . [the machining device being moved along a fixed workpiece]

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

41/10 . . 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)

45/001 . . . . [Housing of the drill, e.g. handcigr]

45/003 . . . . [Attachments]

45/005 . . . . . [Flexible shafts]

45/006 . . . . [Keys for operating the chucks]

45/008 . . . . [Gear boxes, clutches, bearings, feeding mechanisms or like equipment]

45/02 . . driven by electric power

45/04 . . driven by fluid-pressure or pneumatic power

45/042 . . . . [Turbine motors]

45/044 . . . . [Rotary vane type motors]

45/046 . . . . [Piston engines]

45/048 . . . . . [Internal combustion piston engines]

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

**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 B23Q 17/00; for machine tools in general B23Q)

47/26 . . Liftable or lowerable drill heads or headstocks; Balancing arrangements therefor ([weight and flexion compensation B23Q 11/001])

47/28 . . Drill jigs for workpieces (equipment for setting or guiding the drill B23B 49/00)

47/281 . . . . [Jigs for drilling cylindrical parts]

47/282 . . . . [Jigs for drilling spherical parts]

47/284 . . . . [Jigs for drilling rivets or bolts]

47/285 . . . . [Jigs for drilling ski bindings]

47/287 . . . . [Jigs for drilling plate-like workpieces (templates for marking the position of fittings on wings or frames E05D 11/0009)]
Components or accessories for boring or drilling machines

B23B

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

49/001 . Devices for detecting or indicating failure of drills

49/003 . {Devices for detecting or indicating failure of drills}

49/005 . {Attached to the drill}

49/006 . {Attached to drilling machines}

49/008 . {Attached to the nose of the drilling machines}

49/02 . Boring templates or bushings

49/023 . {Bushings and their connection to the template}

49/026 . {Boring bushing carriers attached to the workpiece by glue, magnets, suction devices or the like}

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 {for drilling wood B27G 15/00; for drilling stone or stone-like materials, e.g. brick, concrete, glass B28D 1/00; drill bits for earth or rock drilling E21B 10/00}

51/009 . {Spade drills}

51/018 . {Drills for enlarging a hole}

51/027 . {by tool swivelling}

51/036 . {by a tool-carrying eccentric}

51/045 . {by expanding or tilting the toolhead}

51/054 . {Drill guiding devices}

51/063 . {Centerdrills}

51/072 . {Drills for making non-circular holes}

51/081 . {Conical drills}

51/09 . {Stepped drills}

51/02 . Twist drills

51/04 . Drills for trepanning

51/046 . . . . {Drills with a tubular body (saw cylinders, e.g. having their cutting rim equipped with abrasive particles, for working stone or glass B28D 1/041)}

51/043 . . . . {with exchangeable cutting inserts, e.g. able to be clamped}

51/044 . . . . {with core holding devices}

51/046 . . . . {with exchangeable cutting inserts, e.g. able to be clamped}

51/0453 . . . . {with ejecting devices}

51/046 . . . . {with exchangeable cutting inserts, e.g. able to be clamped}

51/0466 . . . . {with exchangeable cutting inserts, e.g. able to be clamped}

51/0473 . . . . {details about the connection between the driven shaft and the tubular cutting part}

51/048 . . . . {with exchangeable cutting inserts, e.g. able to be clamped (B23B 51/0493 takes precedence)}

51/0486 . . . . {with lubricating or cooling equipment (B23B 51/042 takes precedence)}

51/0493 . . . . {with exchangeable cutting inserts, e.g. able to be clamped}

51/05 . . . . for cutting discs from sheet

51/06 . Drills with lubricating or cooling equipment {(B23B 51/042 and B23B 51/0486 take precedence)}

51/08 . Drills combined with tool parts or tools for performing additional working {(B23G 5/20 takes precedence)}

51/10 . . . . Bits for countersinking

51/101 . . . . {Deburring tools (B23B 51/103 takes precedence)}

51/102 . . . . {Back spot-facing or chamfering}

51/103 . . . . {Deburring or chamfering tools for the ends of tubes or rods}

51/104 . . . . {with stops}

51/105 . . . . {Deburring or countersinking of radial holes}

51/106 . . . . {with a toolholder moving along a direction oblique to the axis}

51/107 . . . . {having a pilot}

51/108 . . . . {having a centering twist drill}

51/12 . Adapters for drills or chucks; Tapered sleeves

51/123 . . . . {Conical reduction sleeves}

51/126 . . . . {Tool elongating devices}

51/14 . . . . Adapters for broken drills

2200/00 Details of cutting inserts

2200/04 . . . . Overall shape

2200/040 . . . . Hexagonal

2200/049 . . . . irregular

2200/0414 . . . . rounded

2200/0419 . . . . tringular

2200/0423 . . . . Irregular

2200/0428 . . . . Lozenge

2200/0433 . . . . rounded

2200/0438 . . . . Octagonal

2200/0442 . . . . rounded

2200/0447 . . . . Parallelogram

2200/0452 . . . . rounded

2200/0457 . . . . Pentagonal

2200/0461 . . . . Round

2200/0466 . . . . Segment or sector of a circle

2200/0471 . . . . Square

2200/0476 . . . . rounded

2200/048 . . . . Star form

2200/0485 . . . . Trapezium

2200/049 . . . . Triangular

2200/0495 . . . . rounded

2200/048 . . . . Rake or top surfaces

2200/081 . . . . with projections (chip breaking projections in general B23B 2200/321)
B23B

2200/082 . . . with elevated clamping surface
2200/083 . . . curved
2200/085 . . . discontinuous
2200/086 . . . with one or more grooves
2200/087 . . . for chip breaking (chip breaking depressions in general B23B 2200/323, multiple chip breaking grooves B23B 2200/325)
2200/088 . . . for clamping
2200/12 . . . Side or flank surfaces
2200/121 . . . with projections
2200/123 . . . curved
2200/125 . . . discontinuous
2200/126 . . . stepped
2200/128 . . . with one or more grooves
2200/16 . . . Supporting or bottom surfaces
2200/161 . . . with projections
2200/162 . . . curved
2200/163 . . . discontinuous
2200/164 . . . ground
2200/165 . . . with one or more grooves
2200/166 . . . polygonal
2200/167 . . . with serrations
2200/168 . . . star form
2200/20 . . . Top or side views of the cutting edge
2200/201 . . . Details of the nose radius and immediately surrounding area
2200/202 . . . with curved cutting edge
2200/204 . . . with discontinuous cutting edge
2200/205 . . . with cutting edge having a wave form
2200/207 . . . for cutting a particular form corresponding to the form of the cutting edge
2200/208 . . . with wiper, i.e. an auxiliary cutting edge to improve surface finish
2200/24 . . . Cross section of the cutting edge
2200/242 . . . bevelled or chamfered
2200/245 . . . rounded
2200/247 . . . sharp
2200/28 . . . Angles
2200/283 . . . Negative cutting angles
2200/286 . . . Positive cutting angles
2200/32 . . . Chip breaking or chip evacuation
2200/321 . . . by chip breaking projections (with projections on rake surface B23B 2200/081)
2200/323 . . . by chip breaking depressions (with one or more grooves on top surface for chip breaking B23B 2200/087, with multiple chip breaking grooves B23B 2200/325)
2200/325 . . . by multiple chip-breaking grooves (with one or more grooves on top surface for chip breaking B23B 2200/087, with chip breaking depression B23B 2200/323)
2200/326 . . . by chip breaking-plates
2200/328 . . . Details of chip evacuation
2200/36 . . . Other features of cutting inserts not covered by B23B 2200/04 - B23B 2200/32
2200/3609 . . . Chamfers
2200/3618 . . . Fixation holes
2200/3627 . . . Indexing (with grooves on bottom surfaces B23C 2200/165, with polygonal bottom surfaces B23B 2200/166, with star form bottom surfaces B23C 2200/167)
2200/3636 . . . with cutting geometries differing according to the indexed position

2200/3645 . . . Lands, i.e. the outer peripheral section of the rake face
2200/3654 . . . being variable (negative lands of variable width B23B 2200/3672)
2200/3663 . . . having negative cutting angles (with bevelled cutting edge B23C 2200/243)
2200/3672 . . . being variable (lands with variable width B23B 2200/3654)
2200/3681 . . . Split inserts, i.e. comprising two or more sections roughly equal in size and having similar or dissimilar cutting geometries
2200/369 . . . Mounted tangentially, i.e. where the rake face is not the face with the largest area

2205/00 Fixation of cutting inserts in holders
2205/02 . . . Fixation using an elastically deformable clamping member
2205/04 . . . Fixation screws, bolts or pins of particular form
2205/045 . . . orientated obliquely to the hole in the insert or to the seating surface
2205/08 . . . using an eccentric
2205/10 . . . using two or more fixation screws
2205/12 . . . Seats for cutting inserts
2205/125 . . . One or more walls of the seat being elastically deformable
2205/16 . . . Shims
2205/18 . . . Systems for indexing the cutting insert automatically
2205/21 . . . Systems for changing the cutting insert automatically
2205/215 . . . using a magazine

2210/00 Details of turning tools
2210/02 . . . Tool holders having multiple cutting inserts
2210/022 . . . Grooving tools
2210/025 . . . Grooving inserts arranged on a turret
2210/027 . . . Means for adjusting the grooving inserts
2210/04 . . . Self-sharpening tools
2210/06 . . . Chip breakers
2210/08 . . . Tools comprising intermediary toolholders
2210/12 . . . Tools comprising weakened spot on the tool at a preferred breakage location (break points on shanks of tools B23B 2231/0212)

2215/00 Details of workpieces
2215/04 . . . Aircraft components
2215/08 . . . Automobile wheels
2215/10 . . . Ammunition cartridge cases
2215/12 . . . Bearing races
2215/16 . . . Camshafts
2215/20 . . . Crankshafts
2215/24 . . . Components of internal combustion engines (B23B 2215/16 and B23B 2215/20 take precedence)
2215/242 . . . Cylinder liners
2215/245 . . . Pistons
2215/247 . . . Piston rings
2215/28 . . . Firearms, guns
2215/32 . . . Railway tracks
2215/36 . . . Railway wheels
2215/40 . . . Spectacles
2215/56 . . . Springs
2215/60 . . . Steel wool
2215/64 . . . Thin walled components
2215/68 . . . Threaded components
2222/00 Details of boring bars or boring heads
2222/04 . Guiding pads
2222/08 . Cutting edges of different lengths or at different axial positions
2222/12 . Cutting inserts located on different radii
2222/16 . Boring, facing or grooving heads with integral electric motor

2231/00 Details of chucks, toolholder shanks or tool shanks
2231/02 . Features of chucks and toolshanks not relating to the operation performed by the tool
2231/0204 . Connection of shanks to working elements of tools
2231/0208 . Bores

2228/00 Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner
2228/04 . applied by chemical vapour deposition [CVD]
2228/08 . applied by physical vapour deposition [PVD]
2228/10 . Coatings
2228/12 . Abrasive
2228/16 . Shape memory alloys
2228/21 . Cast, i.e. In the form of a casting
2228/24 . Hard, i.e. after being hardened
2228/28 . Soft
2228/32 . Explosive
2228/36 . Multi-layered
2228/41 . Highly conductive
2228/44 . Materials having grain size less than 1 micrometre, e.g. nanocrystalline
2228/48 . Self-luminous, i.e. light-emitting, e.g. fluorescent
2228/52 . Solid lubricants
2228/56 . Two phase materials
2228/61 . Materials comprising whiskers

2222/00 Materials of tools or workpieces composed of metals, alloys or metal matrices
2222/04 . Aluminium
2222/12 . Brass
2222/14 . Cast iron (iron B23B 2222/44)
2222/16 . Cermet
2222/21 . Copper
2222/24 . Gold
2222/28 . Details of hard metal, i.e. cemented carbide
2222/32 . Details of high speed steel (stainless steel B23B 2222/32, steel B23B 2222/84)
2222/36 . Nickel chrome alloys, e.g. Inconel®
2222/41 . Nickel steel alloys, e.g. invar®
2222/44 . Iron (cast iron B23B 2222/14)
2222/48 . Lead
2222/52 . Magnesium
2222/56 . Non-specified metals
2222/61 . Metal matrices with non-metallic particles or fibres
2222/64 . Nickel
2222/68 . Palladium
2222/72 . Platinum
2222/76 . Silver
2222/80 . Stainless steel (high speed steel B23B 2222/32, steel B23B 2222/84)
2222/84 . Steel (high speed steel B23B 2222/32, stainless steel B23B 2222/80)
2222/88 . Titanium
2222/92 . Tungsten
2222/98 . Zinc

2224/00 Materials of tools or workpieces composed of a compound including a metal
2224/04 . Aluminium oxide
2224/08 . Aluminium nitride
2224/12 . Chromium carbide
2224/16 . Molybdenum disulphide
2224/20 . Tantalum carbide
2224/24 . Titanium aluminium nitride
2224/28 . Titanium carbide
2224/32 . Titanium carbide nitride (TiCN)
2224/36 . Titanium nitride
2224/40 . Tungsten disulphide

2226/00 Materials of tools or workpieces not comprising a metal
2226/04 . Aromatic polyamides
2226/09 . Asbestos
2226/12 . Boron nitride
2226/15 . Cardboard
2226/18 . Ceramic
2226/27 . Composites
2226/27/5 . Carbon fibre reinforced carbon composites
2226/31 . Diamond
2226/315 . Polycrystalline [PCD]
2226/33 . Elastomers, e.g. rubber
2226/36 . Epoxy
2226/39 . Foam
2226/42 . Gem, i.e. precious stone
2226/45 . Glass (turning glass B28D 1/16, drilling glass B28D 1/14)
2226/48 . Ice
2226/54 . Paper
2226/57 . Plasterboard, i.e. sheetrock
2226/61 . Plastics not otherwise provided for, e.g. nylon
2226/63 . Polyurethane
2226/66 . Polytetrafluoroethylene
2226/69 . Sapphire
2226/72 . Silicon carbide
2226/75 . Stone, rock or concrete (working of stone B28D)
2226/78 . Textile

B23B
Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred (break points on tools not in shank area B23B 2210/12, shanks with reduced cross sections in general B23B 2231/0252)

Overall cross sectional shape of the shank

Triangular

Rounded triangular

Square

Hexagonal

Octagonal

Star form

Special forms not otherwise provided for

Codes for diameters

Shanks having a section of reduced diameter (to provide a preferred breaking point B23B 2231/0212)

Flats

Grooves (keyways B23B 2231/0276)

Axial grooves

Radial grooves

Grooves on conical clamping surfaces

Keyways (axial grooves B23B 2231/0264)

Lugs

Notches

Conical shanks of tools in which the cone is not formed as one continuous surface

Flanges of conical shanks

Ends of conical shanks, e.g. pull studs, tangs

Adapters

Chucks for handtools having means for opening and closing the jaws using the driving motor of the handtool

Chucks for shanks of tools having means for reducing the bending of the retained shanks

Chucks having data storage chips

Chucks having means to loosely retain the tool or workpiece within the spindle in order to release the tool or workpiece

Devices to counteract clamping forces exerted within the spindle in order to release the tool or workpiece

Chucks having a pivotal retention element in the form of a laterally acting cam

Chucks operated by a motor which is movable to engage with, or disengage from, the chuck operating means

Nose pieces (dust covers in chucks B23B 2231/44, dust covers for turning, boring or drilling in general B23B 2260/058)

Chucks with blade-like jaws

Keys preventing rotation

Bores holding the collet having a slightly conical profile

Operating surfaces of collets, i.e. the surface of the collet acted on by the operating means

Non-cylindrical (polygonal B23B 2231/2016)

Polygonal

with a saw-tooth profile

comprising two different cones

Non-circular surfaces of collets for the transmission of torque

Gripping surfaces, i.e. the surface contacting the tool or workpiece

Conical

with non-cylindrical cross section

Polygonal

Roughened

with saw tooth profiles

comprising two or more diameters, e.g. stepped

Collets comprising inserts

brazed in position

glued in position

where the insert forms part of the surface gripping the workpiece or tool

Hard inserts

Inserts mechanically clamped in the collet

Inserts in the form of a roll

Soft inserts

Inserts welded in position

Jaws of collets

of special form

Jaw carriers, i.e. components retaining the collet itself

Keys, spanners or wrenches to operate the collet chuck

Collets comprising screw threads

Collets in which the jaws are formed as separate elements, i.e. not joined together

Slits of collets

extending from both axial ends of the collet

Helical

having a special form not otherwise provided for

Compensating chucks, i.e. with means for the compensation of irregularities of form or position

Cooling or lubrication means

Detection of clamping (in general B23Q 17/006)

Dust covers (nose pieces in chucks B23B 2231/44, dust covers for turning, boring or drilling in general B23B 2260/058)

Flushes with four jaws

Guideways for jaws

Jaws

Different jaws

Sealed joints

using O-rings

Keyless chucks for hand tools

Chucks having a pivotal retention element in the form of a laterally acting cam

Chucks operated by a motor which is movable to engage with, or disengage from, the chuck operating means

Nose pieces (dust covers in chucks B23B 2231/28, dust covers for turning, boring or drilling in general B23B 2260/058)

Pins

Polygonal cross sections

Deviates to counteract clamping forces exerted within the spindle in order to release the tool or workpiece

Chucks with means to loosely retain the tool or workpiece in the unclamped position

Chucks for taps

Details of centres or drivers

Means to allow the facing of the axial end of the workpiece near the axis of rotation

Centres or drivers comprising a ball

Centres or drivers with a special arrangement of bearings or with special bearings

Centres or drivers comprising chucks

Centres or drivers with convex surfaces

Centres or drivers with inserts
2233/28 . Centres or drivers supporting the workpiece at three points around the circumference
2233/32 . Yieldable centres

2235/00 Turning of brake discs, drums or hubs
2235/04 . Machining of brake discs
2235/045 . Simultaneous machining of both sides of the brake disc
2235/12 . Machining of brake drums
2235/16 . Machining of hubs
2235/21 . Compensation of run out

2240/00 Details of connections of tools or workpieces
2240/04 . Bayonet connections
2240/08 . Brazed connections
2240/11 . Soldered connections
2240/16 . Welded connections
2240/21 . Glued connections
2240/24 . Connections using hollow screws, e.g. for the transmission of coolant
2240/28 . Shrink-fitted connections, i.e. using heating and cooling to produce interference fits (shrink fits chucks B23B 31/1179)
2240/32 . Press fits
2240/36 . Connections using a tongue and a hollow of corresponding prismatic form

2247/00 Details of drilling jigs
2247/02 . Jigs for drilling spectacles (machines for drilling spectacle lenses B23D 1/143)
2247/04 . Jigs using one or more holes as datums for drilling further holes
2247/06 . Jigs for drilling holes for lock sets for doors
2247/08 . Jigs for drilling overlapping or interfering holes
2247/10 . Jigs for drilling inclined holes
2247/12 . Drilling jigs with means to affix the jig to the workpiece
2247/14 . Jigs for drilling flanges
2247/16 . Jigs for drilling stairs and associated components, e.g. banisters or handrails
2247/18 . Jigs comprising V-blocks
2247/20 . Jigs for drilling holes for lock wires in bolts or nuts

2250/00 Compensating adverse effects during turning, boring or drilling
2250/04 . Balancing rotating components (vibration damping B23B 2250/16)
2250/08 . Compensation of centrifugal force (use of centrifugal force B23B 2270/04)
2250/12 . Cooling and lubrication
2250/125 . Improving heat transfer away from the working area of the tool by conduction
2250/16 . Damping of vibrations (balancing rotating components B23B 2250/04)

2251/00 Details of tools for drilling machines
2251/02 . Connections between shanks and removable cutting heads
2251/04 . Angles, e.g. cutting angles
2251/043 . Helix angles
2251/046 . Variable
2251/08 . Side or plan views of cutting edges
2251/082 . Curved cutting edges
2251/085 . Discontinuous or interrupted cutting edges
2251/087 . Cutting edges with a wave form
2251/12 . Cross sectional views of the cutting edges
2251/122 . Bevelled cutting edges
2251/125 . Rounded cutting edges
2251/127 . Sharp cutting edges
2251/14 . Configuration of the cutting part, i.e. the main cutting edges
2251/18 . Configuration of the drill point
2251/20 . Number of cutting edges
2251/201 . Single cutting edge
2251/202 . Three cutting edges
2251/204 . Four cutting edges
2251/205 . Five cutting edges
2251/207 . Six cutting edges
2251/208 . Eight cutting edges
2251/24 . Overall form of drilling tools
2251/241 . Cross sections of the diameter of the drill
2251/242 . Increasing in a direction towards the shank from the tool tip
2251/244 . Decreasing in a direction towards the shank from the tool tip
2251/245 . Variable cross sections
2251/247 . Drilling tools having a working portion at both ends of the shank
2251/248 . Drills in which the outer surface is of special form
2251/28 . Arrangement of teeth
2251/282 . Unequal spacing of cutting edges in the circumferential direction
2251/285 . Cutting teeth arranged at different heights
2251/287 . Cutting edges having different lengths
2251/40 . Flutes, i.e. chip conveying grooves
2251/402 . with increasing depth in a direction towards the shank from the tool tip
2251/404 . with decreasing depth in a direction towards the shank from the tool tip
2251/406 . of special form not otherwise provided for
2251/408 . Spiral grooves
2251/42 . Types of drill
2251/422 . Deep hole drills, e.g. ejector drills
2251/424 . Gun drills
2251/426 . Microdrills
2251/428 . Drills for cutting plugs of material
2251/44 . Margins, i.e. the area of the circumference following the axial cutting edge in the direction of rotation
2251/443 . Double margin drills
2251/446 . Drills with variable margins
2251/46 . Drills having a centre free from cutting edges or with recessed cutting edges
2251/48 . Chip breakers
2251/50 . Drilling tools comprising cutting inserts
2251/505 . set at different heights
2251/52 . Depth indicators
2251/54 . Drilling tools having provision for drilling different diameters
2251/56 . Guiding pads
2251/58 . Guiding rolls
2251/60 . Drills with pilots
2251/603 . Detachable pilots, e.g. in the form of a drill
2251/606 . Being a twist drill
2251/62 . Drilling tools having means to reinforce the shank, e.g. drills having small shanks being gripped by devices having a larger shank
Details of constructional elements

- Drills operating in the reverse direction, i.e. in the unscrewing direction of a right-hand thread
- Drills with provision to be used as a screwdriver
- Drills with provision for suction (use of suction in turning, boring or drilling in general B23B 2270/62)
- Drills with vibration suppressing means

- Accumulators
- Adjustable elements
- Two elements adjustable relative to each other in three mutually perpendicular directions
- Bearings
- Sliding contact bearings
- Needle roller bearings
- Preloading of bearings
- Bolts
- Brushes
- Cams
- Balls
- Batteries
- Bushings, e.g. adapter sleeves
- Chains
- Clamps
- Diaphragms
- Drawbars
- Cables
- Cartridges
- Centre drills of known configuration, e.g. the provision of a centre drill in centres or chucks
- Collets of known configuration, i.e. devices using a collet
- Overload clutches
- Devices to regulate the depth of cut
- Depth controls, e.g. depth stops (stops B23B 2260/12)
- Depth gauges
- Depth indicators (indication scales B23B 2260/088)
- Differential screw threads
- Dust covers (dust covers in chucks B23B 2231/28, nose pieces in chucks B23B 2231/44)
- Electric motors
- Linear motors
- Electrostrictive elements
- Flexible members
- Gears
- Grooves
- Spiral
- Harmonic drive gearboxes, i.e. reduction gearing including wave generator, flex spline and a circular spline
- Hand tools used to operate chucks or to assemble, adjust or disassemble tools or equipment used for turning, boring or drilling
- for unclamping cutting inserts
- Holes
- Hirth couplings
- Indication scales
- Knurled surfaces
- Lasers
- Levels, e.g. spirit levels
- Levers
- Magazines
- Magnets
- Magnetostrictive elements
- Markings, i.e. symbols or other indicating marks
- Nuts
- Piezoelectric elements
- Planetary drives
- Projections
- Rings
- Rollers or rolls
- Suction pads or vacuum cups, e.g. for attachment of guides to workpieces
- Stops (depth controls B23B 2260/0482)
- Safety devices
- Screws
- Seals
- Sensors
- Vibration sensors
- Serrations (cutting inserts with serrated bottom surfaces B23B 2200/167)
- Spacers or shims (shims for supporting cutting inserts B23B 2205/16)
- Springs
- Screw threads
- Conical
- with round thread profile
- with square thread profile
- with trapezoidal thread profile
- with special profile not otherwise provided for
- Valves
- Wear indicators
- Wedges
- Worms and worm wheels

Details of general geometric configurations

- Conical
- Eccentric
- Elliptical
- Polygonal
- Square
- Pentagonal
- Hexagonal
- Octagonal
- Round
- Spherical

Details of turning, boring or drilling machines, processes or tools not otherwise provided for

- Use of a particular power source
- Electricity
- Hydraulics
- Pneumatics
- Use of centrifugal force (compensating centrifugal force B23B 2250/08)
- Use of elastic deformation
- Clamping mechanisms; Provisions for clamping (B23B 2210/00 takes precedence)
- Details relating to unclamping
- Use of ultrasound
- Centering of two components relative to one another
- Constructions comprising exactly two similar components
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<td>Externally located features, machining or gripping of external surfaces (machining or gripping of both internal and external surfaces B23B 2270/205)</td>
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<td>B23B 2270/62</td>
<td>Use of suction (suction pads or vacuum cups B23B 2260/118, drilling tools with provision for suction B23B 2251/68, chip removal B23B 2270/30)</td>
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