

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SHAPING

B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR
(punching, perforating, making articles by processing sheet metal, tubes, or profiles [B21D](#); wire-working [B21F](#); making pins, needles, or nails [B21G](#); making chains [B21L](#); grinding [B24](#))
(NOTES omitted)

B23B TURNING; BORING (arrangements for copying or controlling [B23Q](#))

WARNING

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

B23B 3/18	covered by	B23B 3/16
B23B 3/20	covered by	B23B 3/16
B23B 3/28	covered by	B23B 3/00
B23B 5/22	covered by	B23B 31/00
B23B 5/24	covered by	B23Q 27/00 ; B23B 35/00
B23B 5/30	covered by	B23Q 35/00
B23B 5/34	covered by	B23B 31/00 ; B23B 33/00
B23B 5/42	covered by	B23Q 35/00
B23B 5/44	covered by	B23Q 27/00
B23B 7/08	covered by	B23B 7/04
B23B 7/14	covered by	B23B 7/12
B23B 7/16	covered by	B23B 7/12
B23B 9/04	covered by	B23B 9/02
B23B 9/06	covered by	B23B 9/02
B23B 9/10	covered by	B23B 9/08
B23B 9/12	covered by	B23B 9/08
B23B 15/00	covered by	B23Q 7/00
B23B 17/00	covered by	B23Q 1/01 ; B23Q 1/03 ; B23Q 1/25
B23B 19/00	covered by	B23Q 1/70
B23B 19/02	covered by	B23Q 1/70
B23B 21/00	covered by	B23Q 1/00
B23B 29/30	covered by	B23B 29/28
B23B 31/163	covered by	B23B 31/16004
B23B 31/165	covered by	B23B 31/16045
B23B 31/167	covered by	B23B 31/16045
B23B 31/169	covered by	B23B 31/16083
B23B 31/171	covered by	B23B 31/1612
B23B 31/173	covered by	B23B 31/16158
B23B 31/175	covered by	B23B 31/16195
B23B 31/177	covered by	B23B 31/16233
B23B 41/08	covered by	F16L 41/04
B23B 45/14	covered by	B25H 1/0021
B23B 45/16	covered by	B25D 16/00
B23B 47/02	covered by	B23Q 5/00
B23B 47/04	covered by	B23Q 5/00
B23B 47/06	covered by	B23Q 5/00
B23B 47/08	covered by	B23Q 5/00
B23B 47/10	covered by	B23Q 5/00
B23B 47/12	covered by	B23Q 5/00
B23B 47/14	covered by	B23Q 5/00
B23B 47/16	covered by	B23Q 5/00
B23B 47/18	covered by	B23Q 5/00
B23B 47/20	covered by	B23Q 5/00
B23B 47/22	covered by	B23Q 5/00

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](#))
- 3/065 . . {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 {(rotatable members, e.g. faceplates [B23Q 1/50](#))}
- 3/16 . Turret lathes for turning individually-chucked workpieces {(turrets [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 heads therefor
- 3/26 . . the tools of which perform a radial movement; Rotary tool heads thereof
- 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 {(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
- 7/04 . . Turret machines

- 7/06 . . with sliding headstock
- 7/10 . . Accessories, e.g. guards [{\(guards B23Q 11/08 takes precedence\)}](#)
- 7/12 . Automatic or semi-automatic machines for turning of workpieces
- 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 predetermined positions; Equipment therefor (equipment applicable to single-spindle machines B23B 7/00)**
- 9/005 . [{Spindle carriers: constructional details, drives for the spindles, or the like}](#)
- 9/02 . Automatic or semi-automatic machines for turning of stock
- 9/08 . Automatic or semi-automatic machines for turning of workpieces
- 11/00 Automatic or semi-automatic turning-machines incorporating equipment for performing other working procedures, e.g. slotting, milling, rolling [{\(B23B 3/065 and B23B 3/16 take precedence; machines incorporating a plurality of sub-assemblies, each capable of performing a metal-working operation, the sub-assemblies being arranged to operate simultaneously at different stations B23Q 39/04\)}](#)**
- 13/00 Arrangements for automatically conveying or chucking or guiding stock**
- 13/02 . for turning-machines with a single working-spindle
- 13/021 . . [{Feeding device having intermittent movement}](#)
- 13/022 . . . [{being placed in the spindle}](#)
- 13/024 [{including two collets}](#)
- 13/025 . . [{with stock drum}](#)
- 13/027 . . [{Feeding by pistons under fluid-pressure}](#)
- 13/028 . . [{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
- 13/121 . . [{Stops \(stops for equipment for precise positioning of tool or work into particular locations not otherwise provided for B23Q 16/00\)}](#)
- 13/123 . . [{Grippers, pushers or guiding tubes \(arrangements for reducing vibrations in feeding-passages or for damping noise B23B 13/08\)}](#)
- 13/125 . . . [{Feed collets \(feeding device having intermittent movement being placed in the spindle including two collets B23B 13/024; collet chucks B23B 31/20\)}](#)
- 13/126 . . [{Supports}](#)
- 13/128 . . [{Stock rest handling devices, e.g. ejectors}](#)

Components or accessories particularly for turning machines

- 23/00 Tailstocks; Centres [{\(for grinding machines B24B 41/062\)}](#)**
- 23/005 . [{the centres being adjustable}](#)
- 23/02 . Dead centres
- 23/025 . . [{the centres being adjustable}](#)
- 23/04 . Live centres
- 23/045 . . [{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 [\(measuring devices or gauges G01B\)](#)
- 25/065 . . [{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
- 27/002 . [{with vibration damping means}](#)
- 27/005 . [{Geometry of the chip-forming or the clearance planes, e.g. tool angles \[\\(B23B 27/141 and B23B 27/22 take precedence\\)\]\(#\)}](#)
- 27/007 . [{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 . Cutting-off tools [\(B23B 27/08 takes precedence ; toolholders for cutting-off inserts B23B 29/043\)}](#)
- 27/045 . . [{with chip-breaking arrangements}](#)
- 27/06 . Profile cutting tools, i.e. forming-tools
- 27/065 . . [{Thread-turning tools}](#)
- 27/08 . Cutting tools with blade- or disc-like main parts [{\(with disc-like main parts B23B 27/083\)}](#)
- 27/083 . . [{Cutting tools with disc-like main parts}](#)
- 27/086 . . [{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; Holders therefor
- 27/14 . Cutting tools of which the bits or tips [{or cutting inserts}](#) are of special material

- 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 undercuttings
- 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}

- 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 31/16](#); 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}
- 31/02 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](#))}

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

- 31/16183 {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}
- 31/4033 {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 splintering}
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. handgrip}
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 1/70; 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)}

47/288	. . . {involving dowelling}	51/046	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}
47/30	. Additional gear with one or more working-spindles attachable to the main working-spindle and mounting the additional gear {(multi-spindle drilling machines B23B 39/16)}	51/0466	. . . {with exchangeable cutting inserts, e.g. able to be clamped}
47/32	. Arrangements for preventing the running-out of drills or fracture of drills when getting through	51/0473	. . . {details about the connection between the driven shaft and the tubular cutting part}
47/34	. Arrangements for removing chips out of the holes made; Chip- breaking arrangements attached to the tool {(chip-breaking in turning machines B23B 25/02; in turning tools B23B 27/22)}	51/048	. . {with exchangeable cutting inserts, e.g. able to be clamped (B23B 51/0493 takes precedence)}
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)	51/0486	. . {with lubricating or cooling equipment (B23B 51/042 takes precedence)}
49/001	. {Devices for detecting or indicating failure of drills}	51/0493	. . . {with exchangeable cutting inserts, e.g. able to be clamped}
49/003	. {Stops attached to drilling tools, tool holders or drilling machines (B23B 51/104 takes precedence)}	51/05	. . for cutting discs from sheet
49/005	. . {Attached to the drill}	51/06	. Drills with lubricating or cooling equipment {(B23B 51/042 and B23B 51/0486 take precedence)}
49/006	. . {Attached to drilling machines}	51/08	. Drills combined with tool parts or tools for performing additional working {(B23G 5/20 takes precedence)}
49/008	. . . {Attached to the nose of the drilling machines}	51/10	. Bits for countersinking
49/02	. Boring templates or bushings	51/101	. . {Deburring tools (B23B 51/103 takes precedence)}
49/023	. . {Bushings and their connection to the template}	51/102	. . {Back spot-facing or chamfering}
49/026	. . {Boring bushing carriers attached to the workpiece by glue, magnets, suction devices or the like}	51/103	. . {Deburring or chamfering tools for the ends of tubes or rods}
49/04	. Devices for boring or drilling centre holes in workpieces	51/104	. . {with stops}
49/06	. Devices for drilling holes in brake bands or brake linings	51/105	. . {Deburring or countersinking of radial holes}
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)}	51/106	. . {with a toolholder moving along a direction oblique to the axis}
51/0009	. {Spade drills}	51/107	. . {having a pilot}
51/0018	. {Drills for enlarging a hole}	51/108	. . {having a centering twist drill}
51/0027	. . {by tool swivelling}	51/12	. Adapters for drills or chucks; Tapered sleeves
51/0036	. . {by a tool-carrying eccentric}	51/123	. . {Conical reduction sleeves}
51/0045	. . {by expanding or tilting the toolhead}	51/126	. . {Tool elongating devices}
51/0054	. {Drill guiding devices}	51/14	. . Adapters for broken drills
51/0063	. {Centerdrills}		
51/0072	. {Drills for making non-circular holes}		
51/0081	. {Conical drills}		
51/009	. {Stepped drills}		
51/02	. Twist drills		
51/04	. Drills for trepanning		
51/0406	. . {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)}		
51/0413	. . . {with core-cutting-off devices}		
51/042	. . . {with lubricating or cooling equipment}		
51/0426	. . . {with centering devices}		
51/0433	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}		
51/044	. . . {with core holding devices}		
51/0446	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}		
51/0453	. . . {with ejecting devices}		
		2200/00	Details of cutting inserts
		2200/04	. Overall shape
		2200/0404	. . Hexagonal
		2200/0409	. . . irregular
		2200/0414	. . . rounded
		2200/0419	. . . trigonal
		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
		2200/08	. Rake or top surfaces
		2200/081	. . with projections (chip breaking projections in general B23B 2200/321)

- 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

2215/72	. Tubes, pipes	2226/04	. Aromatic polyamides
2215/76	. Components for turbines	2226/09	. Asbestos
2215/81	. . Turbine blades	2226/12	. Boron nitride
2220/00	Details of turning, boring or drilling processes	2226/125	. . cubic [CBN]
2220/04	. Chamferring (B23B 2220/28 takes precedence)	2226/15	. Cardboard
2220/08	. Deburring	2226/18	. Ceramic
2220/12	. Grooving	2226/27	. Composites
2220/123	. . Producing internal grooves	2226/275	. . Carbon fibre reinforced carbon composites
2220/126	. . Producing ring grooves	2226/31	. Diamond
2220/24	. Finishing (roughing and finishing B23B 2220/445)	2226/315	. . polycrystalline [PCD]
2220/28	. Parting off and chamferring simultaneously	2226/33	. Elastomers, e.g. rubber
2220/32	. Drilling holes from both sides	2226/36	. Epoxy
2220/36	. Turning, boring or drilling at high speeds	2226/39	. Foam
2220/40	. Peeling	2226/42	. Gem, i.e. precious stone
2220/44	. Roughing	2226/45	. Glass (turning glass B28D 1/16 , drilling glass B28D 1/14)
2220/445	. . and finishing	2226/48	. Ice
2220/52	. Whirling	2226/54	. Paper
2222/00	Materials of tools or workpieces composed of metals, alloys or metal matrices	2226/57	. Plasterboard, i.e. sheetrock
2222/04	. Aluminium	2226/61	. Plastics not otherwise provided for, e.g. nylon
2222/12	. Brass	2226/63	. Polyurethane
2222/14	. Cast iron (iron B23B 2222/44)	2226/66	. Polytetrafluoroethylene
2222/16	. Cermet	2226/69	. Sapphire
2222/21	. Copper	2226/72	. Silicon carbide
2222/24	. Gold	2226/75	. Stone, rock or concrete (working of stone B28D)
2222/28	. Details of hard metal, i.e. cemented carbide	2226/78	. Textile
2222/32	. Details of high speed steel (stainless steel B23B 2222/80 , steel B23B 2222/84)	2228/00	Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner
2222/36	. Nickel chrome alloys, e.g. Inconel®	2228/04	. applied by chemical vapour deposition [CVD]
2222/41	. Nickel steel alloys, e.g. invar®	2228/08	. applied by physical vapour deposition [PVD]
2222/44	. Iron (cast iron B23B 2222/14)	2228/10	. Coatings
2222/48	. Lead	2228/105	. . with specified thickness
2222/52	. Magnesium	2228/12	. Abrasive
2222/56	. Non-specified metals	2228/16	. Shape memory alloys
2222/61	. Metal matrices with non-metallic particles or fibres	2228/21	. Cast, i.e. In the form of a casting
2222/64	. Nickel	2228/24	. Hard, i.e. after being hardened
2222/68	. Palladium	2228/28	. Soft
2222/72	. Platinum	2228/32	. Explosive
2222/76	. Silver	2228/36	. Multi-layered
2222/80	. Stainless steel (high speed steel B23B 2222/32 , steel B23B 2222/84)	2228/41	. Highly conductive
2222/84	. Steel (high speed steel B23B 2222/32 , stainless steel B23B 2222/80)	2228/44	. Materials having grain size less than 1 micrometre, e.g. nanocrystalline
2222/88	. Titanium	2228/48	. Self-luminous, i.e. light-emitting, e.g. fluorescent
2222/92	. Tungsten	2228/52	. Solid lubricants
2222/98	. Zinc	2228/56	. Two phase materials
2224/00	Materials of tools or workpieces composed of a compound including a metal	2228/61	. Materials comprising whiskers
2224/04	. Aluminium oxide	2229/00	Details of boring bars or boring heads
2224/08	. Aluminium nitride	2229/04	. Guiding pads
2224/12	. Chromium carbide	2229/08	. Cutting edges of different lengths or at different axial positions
2224/16	. Molybdenum disulphide	2229/12	. Cutting inserts located on different radii
2224/20	. Tantalum carbide	2229/16	. Boring, facing or grooving heads with integral electric motor
2224/24	. Titanium aluminium nitride	2231/00	Details of chucks, toolholder shanks or tool shanks
2224/28	. Titanium carbide	2231/02	. Features of shanks of tools not relating to the operation performed by the tool
2224/32	. Titanium carbide nitride (TiCN)	2231/0204	. . Connection of shanks to working elements of tools
2224/36	. Titanium nitride	2231/0208	. . Bores
2224/40	. Tungsten disulphide		
2226/00	Materials of tools or workpieces not comprising a metal		

- 2231/0212 . . 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](#))
- 2231/0216 . . Overall cross sectional shape of the shank ([not used](#))
- 2231/022 . . . Triangular
- 2231/0224 Rounded triangular
- 2231/0228 . . . Square
- 2231/0232 . . . Hexagonal
- 2231/0236 . . . Octagonal
- 2231/024 . . . Star form
- 2231/0244 . . . Special forms not otherwise provided for
- 2231/0248 . . Codes for diameters
- 2231/0252 . . Shanks having a section of reduced diameter ([to provide a preferred breaking point B23B 2231/0212](#))
- 2231/0256 . . Flats
- 2231/026 . . Grooves ([keyways B23B 2231/0276](#))
- 2231/0264 . . . Axial grooves
- 2231/0268 . . . Radial grooves
- 2231/0272 . . . Grooves on conical clamping surfaces
- 2231/0276 . . Keyways ([axial grooves B23B 2231/0264](#))
- 2231/028 . . Lugs
- 2231/0284 . . Notches
- 2231/0288 . . Conical shanks of tools in which the cone is not formed as one continuous surface
- 2231/0292 . . Flanges of conical shanks
- 2231/0296 . . Ends of conical shanks, e.g. pull studs, tangs
- 2231/04 . . Adapters
- 2231/06 . . Chucks for handtools having means for opening and closing the jaws using the driving motor of the handtool
- 2231/08 . . Chucks for shanks of tools having means for reducing the bending of the retained shanks
- 2231/10 . . Chucks having data storage chips
- 2231/12 . . Chucks having means to amplify the force produced by the actuating means to increase the clamping force
- 2231/14 . . Chucks with clamping force limitation means
- 2231/20 . . Collet chucks
- 2231/2002 . . . Collets having blade-like jaws
- 2231/2005 . . . Keys preventing rotation
- 2231/2008 . . . Bores holding the collet having a slightly conical profile
- 2231/201 . . . Operating surfaces of collets, i.e. the surface of the collet acted on by the operating means
- 2231/2013 Non-cylindrical ([polygonal B23B 2231/2016](#))
- 2231/2016 Polygonal
- 2231/2018 with a saw-tooth profile
- 2231/2021 comprising two different cones
- 2231/2024 . . . Non-circular surfaces of collets for the transmission of torque
- 2231/2027 . . . Gripping surfaces, i.e. the surface contacting the tool or workpiece
- 2231/2029 Conical
- 2231/2032 with non-cylindrical cross section
- 2231/2035 Polygonal
- 2231/2037 Roughened
- 2231/204 with saw tooth profiles
- 2231/2043 Discontinuous, interrupted or split
- 2231/2045 comprising two or more diameters, e.g. stepped
- 2231/2048 . . . Collets comprising inserts
- 2231/2051 brazed in position
- 2231/2054 glued in position
- 2231/2056 where the insert forms part of the surface gripping the workpiece or tool
- 2231/2059 Hard inserts
- 2231/2062 Inserts mechanically clamped in the collet
- 2231/2064 Inserts in the form of a roll
- 2231/2067 Soft inserts
- 2231/207 Inserts welded in position
- 2231/2072 . . . Jaws of collets
- 2231/2075 of special form
- 2231/2078 . . . Jaw carriers, i.e. components retaining the collet itself
- 2231/2081 . . . Keys, spanners or wrenches to operate the collet chuck
- 2231/2083 . . . Collets comprising screw threads
- 2231/2086 . . . Collets in which the jaws are formed as separate elements, i.e. not joined together
- 2231/2089 . . . Slits of collets
- 2231/2091 extending from both axial ends of the collet
- 2231/2094 Helical
- 2231/2097 having a special form not otherwise provided for
- 2231/22 . . Compensating chucks, i.e. with means for the compensation of irregularities of form or position
- 2231/24 . . Cooling or lubrication means
- 2231/26 . . Detection of clamping ([in general B23Q 17/006](#))
- 2231/28 . . Dust covers ([nose pieces in chucks B23B 2231/44](#), [dust covers for turning, boring or drilling in general B23B 2260/058](#))
- 2231/30 . . Chucks with four jaws
- 2231/32 . . Guideways for jaws
- 2231/34 . . Jaws
- 2231/345 . . . Different jaws
- 2231/36 . . Sealed joints
- 2231/365 . . . using O-rings
- 2231/38 . . Keyless chucks for hand tools
- 2231/40 . . Chucks having a pivotal retention element in the form of a laterally acting cam
- 2231/42 . . Chucks operated by a motor which is movable to engage with, or disengage from, the chuck operating means
- 2231/44 . . Nose pieces ([dust covers in chucks B23B 2231/28](#), [dust covers for turning, boring or drilling in general B23B 2260/058](#))
- 2231/46 . . Pins
- 2231/48 . . Polygonal cross sections
- 2231/50 . . Devices to counteract clamping forces exerted within the spindle in order to release the tool or workpiece
- 2231/52 . . Chucks with means to loosely retain the tool or workpiece in the unclamped position
- 2231/54 . . Chucks for taps
- 2233/00 Details of centres or drivers**
- 2233/04 . . Means to allow the facing of the axial end of the workpiece near the axis of rotation
- 2233/08 . . Centres or drivers comprising a ball
- 2233/12 . . Centres or drivers with a special arrangement of bearings or with special bearings
- 2233/16 . . Centres or drivers comprising chucks
- 2233/20 . . Centres or drivers with convex surfaces

- 2233/24 . 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 B28D 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
- 2251/64 . Drills operating in the reverse direction, i.e. in the unscrewing direction of a right-hand thread
- 2251/66 . Drills with provision to be used as a screwdriver
- 2251/68 . Drills with provision for suction ([use of suction in turning, boring or drilling in general B23B 2270/62](#))
- 2251/70 . Drills with vibration suppressing means
- 2260/00 Details of constructional elements**
- 2260/002 . Accumulators
- 2260/004 . Adjustable elements
- 2260/0045 . . Two elements adjustable relative to each other in three mutually perpendicular directions
- 2260/008 . Bearings
- 2260/0082 . . Sliding contact bearings
- 2260/0085 . . Needle roller bearings
- 2260/0087 . . Preloading of bearings
- 2260/016 . Bolts
- 2260/018 . Brushes
- 2260/02 . Cams
- 2260/022 . Balls
- 2260/024 . Batteries
- 2260/026 . Bushings, e.g. adapter sleeves
- 2260/028 . Chains
- 2260/03 . Clamps
- 2260/032 . Diaphragms
- 2260/034 . Drawbars
- 2260/036 . Cables
- 2260/038 . Cartridges
- 2260/04 . Centre drills of known configuration, e.g. the provision of a centre drill in centres or chucks
- 2260/042 . Collets of known configuration, i.e. devices using a collet
- 2260/044 . Clutches
- 2260/0445 . . Overload clutches
- 2260/048 . Devices to regulate the depth of cut
- 2260/0482 . . Depth controls, e.g. depth stops ([stops B23B 2260/12](#))
- 2260/0485 . . Depth gauges
- 2260/0487 . . Depth indicators ([indication scales B23B 2260/088](#))
- 2260/056 . Differential screw threads
- 2260/058 . Dust covers ([dust covers in chucks B23B 2231/28](#), [nose pieces in chucks B23B 2231/44](#))
- 2260/062 . Electric motors
- 2260/0625 . . Linear motors
- 2260/066 . Electrostrictive elements
- 2260/068 . Flexible members
- 2260/07 . Gears
- 2260/072 . Grooves
- 2260/0725 . . Spiral
- 2260/076 . Harmonic drive gearboxes, i.e. reduction gearing including wave generator, flex spline and a circular spline
- 2260/078 . Hand tools used to operate chucks or to assemble, adjust or disassemble tools or equipment used for turning, boring or drilling
- 2260/0785 . . for unclamping cutting inserts
- 2260/082 . Holes
- 2260/084 . Hirth couplings
- 2260/088 . Indication scales
- 2260/09 . Knurled surfaces
- 2260/092 . Lasers
- 2260/094 . Levels, e.g. spirit levels
- 2260/096 . Levers
- 2260/098 . Magazines
- 2260/10 . Magnets
- 2260/102 . Magnetostrictive elements
- 2260/104 . Markings, i.e. symbols or other indicating marks
- 2260/106 . Nuts
- 2260/108 . Piezoelectric elements
- 2260/11 . Planetary drives
- 2260/112 . Projections
- 2260/114 . Rings
- 2260/116 . Rollers or rolls
- 2260/118 . Suction pads or vacuum cups, e.g. for attachment of guides to workpieces
- 2260/12 . Stops ([depth controls B23B 2260/0482](#))
- 2260/122 . Safety devices
- 2260/124 . Screws
- 2260/126 . Seals
- 2260/128 . Sensors
- 2260/1285 . . Vibration sensors
- 2260/132 . Serrations ([cutting inserts with serrated bottom surfaces B23B 2200/167](#))
- 2260/134 . Spacers or shims ([shims for supporting cutting inserts B23B 2205/16](#))
- 2260/136 . Springs
- 2260/138 . Screw threads
- 2260/1381 . . Conical
- 2260/1383 . . with round thread profile
- 2260/1385 . . with square thread profile
- 2260/1386 . . with trapezoidal thread profile
- 2260/1388 . . with special profile not otherwise provided for
- 2260/142 . Valves
- 2260/144 . Wear indicators
- 2260/146 . Wedges
- 2260/158 . Worms and worm wheels
- 2265/00 Details of general geometric configurations**
- 2265/08 . Conical
- 2265/12 . Eccentric
- 2265/16 . Elliptical
- 2265/32 . Polygonal
- 2265/322 . . Square
- 2265/324 . . Pentagonal
- 2265/326 . . Hexagonal
- 2265/328 . . Octagonal
- 2265/34 . Round
- 2265/36 . Spherical
- 2270/00 Details of turning, boring or drilling machines, processes or tools not otherwise provided for**
- 2270/02 . Use of a particular power source
- 2270/022 . . Electricity
- 2270/025 . . Hydraulics
- 2270/027 . . Pneumatics
- 2270/04 . Use of centrifugal force ([compensating centrifugal force B23B 2250/08](#))
- 2270/06 . Use of elastic deformation
- 2270/08 . Clamping mechanisms; Provisions for clamping ([B23B 2210/00 takes precedence](#))
- 2270/09 . Details relating to unclamping
- 2270/10 . Use of ultrasound

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- 2270/12 . Centering of two components relative to one another
- 2270/14 . Constructions comprising exactly two similar components
- 2270/16 . Constructions comprising three or more similar components
- 2270/20 . Internally located features, machining or gripping of internal surfaces
- 2270/205 . . Machining or gripping both internal and external surfaces
- 2270/22 . Externally located features, machining or gripping of external surfaces ([machining or gripping of both internal and external surfaces B23B 2270/205](#))
- 2270/24 . Tool, chuck or other device activated by the coolant or lubrication system of the machine tool
- 2270/26 . Burnishing
- 2270/28 . Cleaning
- 2270/30 . Chip guiding or removal ([use of suction B23B 2270/62, drilling tools with provision for suction B23B 2251/68](#))
- 2270/32 . Use of electronics
- 2270/34 . Means for guiding
- 2270/36 . Identification of tooling or other equipment
- 2270/38 . Using magnetic fields ([magnets B23B 2260/10](#))
- 2270/48 . Measuring or detecting
- 2270/483 . . Measurement of force
- 2270/486 . . Measurement of rotational speed
- 2270/54 . Methods of turning, boring or drilling not otherwise provided for
- 2270/56 . Turning, boring or drilling tools or machines with provision for milling
- 2270/58 . Oblique elements
- 2270/60 . Prevention of rotation
- 2270/62 . 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](#))