

# 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

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

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

B23B  
(continued) 2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

**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](#); rotary devices holding by magnetic and/or electrical force acting directly on work [B23Q 3/152](#))
- WARNING**  
Group [B23B 31/00](#) is impacted by reclassification into groups [B23B 2231/56](#), [B23B 2231/565](#), and [B23B 2231/58](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 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
- WARNING**  
Group [B23B 31/02](#) is impacted by reclassification into groups [B23B 31/0261](#), [B23B 2231/56](#), [B23B 2231/565](#), and [B23B 2231/58](#).  
All groups listed in this Warning should be considered in order to perform a complete search.
- 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](#))}
- WARNING**  
Group [B23B 31/026](#) is impacted by reclassification into group [B23B 31/0261](#).  
Groups [B23B 31/026](#) and [B23B 31/0261](#) should be considered in order to perform a complete search.
- 31/0261 . . . . . {for centering the tool}
- WARNING**  
Group [B23B 31/0261](#) is incomplete pending reclassification of documents from groups [B23B 31/02](#) and [B23B 31/026](#).  
Groups [B23B 31/02](#), [B23B 31/026](#), and [B23B 31/0261](#) should be considered in order to perform a complete search.
- 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

**WARNING**

Group [B23B 31/107](#) is impacted by reclassification into group [B23B 31/1079](#). Groups [B23B 31/107](#) and [B23B 31/1079](#) should be considered in order to perform a complete search.

- 31/1071 . . . . {Retention by balls (balls acting as jaws [B23B 31/22](#))}
- 31/1072 . . . . {Retention by axially or circumferentially oriented cylindrical elements (cylindrical elements acting as jaws [B23B 31/22](#))}

**WARNING**

Group [B23B 31/1072](#) is impacted by reclassification into groups [B23B 31/10741](#) and [B23B 31/1079](#). Groups [B23B 31/1072](#), [B23B 31/10741](#), and [B23B 31/1079](#) should be considered in order to perform a complete search.

- 31/1073 . . . . {Retention by conical elements (conical elements acting as jaws [B23B 31/22](#))}
- 31/10741 . . . . {Retention by substantially radially oriented pins}

**WARNING**

Group [B23B 31/10741](#) is incomplete pending reclassification of documents from group [B23B 31/1072](#). Groups [B23B 31/1072](#) and [B23B 31/10741](#) should be considered in order to perform a complete search.

- 31/1075 . . . . {Retention by screws}
- 31/1076 . . . . . {with conical ends}
- 31/1077 . . . . . {acting on a floating pin}

- 31/1078 . . . . {Retention by wedges}
- 31/1079 . . . . {Retention by spring or wire}

**WARNING**

Group [B23B 31/1079](#) is incomplete pending reclassification of documents from groups [B23B 31/107](#) and [B23B 31/1072](#).

Groups [B23B 31/107](#), [B23B 31/1072](#), and [B23B 31/1079](#) should be considered in order to perform a complete search.

- 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 . . . . . {pivotaly 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 centrifugal force

**WARNING**

Group [B23B 31/14](#) is impacted by reclassification into groups [B23B 31/141](#) and [B23B 31/142](#).

Groups [B23B 31/14](#), [B23B 31/141](#) and [B23B 31/142](#) should be considered in order to perform a complete search.

31/141 . . . . . {To counterbalance the jaws}

**WARNING**

Group [B23B 31/141](#) is incomplete pending reclassification of documents from group [B23B 31/14](#).

Groups [B23B 31/14](#) and [B23B 31/141](#) should be considered in order to perform a complete search.

31/142 . . . . . {To grip a tool or workpiece}

**WARNING**

Group [B23B 31/142](#) is incomplete pending reclassification of documents from group [B23B 31/14](#).

Groups [B23B 31/14](#) and [B23B 31/142](#) should be considered in order to perform a complete search.

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}

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

**WARNING**

Group [B23B 31/20](#) is impacted by reclassification into groups [B23B 31/2012](#), [B23B 31/20125](#), [B23B 31/2025](#), [B23B 31/206](#), [B23B 31/2072](#), and [B23B 31/2073](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 31/201 . . . . . {Characterized by features relating primarily to remote control of the gripping means}

**WARNING**

Group [B23B 31/201](#) is impacted by reclassification into groups [B23B 31/2012](#), [B23B 31/20125](#), [B23B 31/206](#), [B23B 31/2072](#), and [B23B 31/2073](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 31/2012 . . . . . {Threaded cam actuator}

**WARNING**

Groups [B23B 31/2012](#) and [B23B 31/20125](#) are incomplete pending reclassification of documents from groups [B23B 31/20](#) and [B23B 31/201](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 31/20125 . . . . . {Axially fixed cam, moving jaws}

- 31/202 . . . . . {Details of the jaws}

**WARNING**

Group [B23B 31/202](#) is impacted by reclassification into group [B23B 31/2025](#).

Groups [B23B 31/202](#) and [B23B 31/2025](#) should be considered in order to perform a complete search.

- 31/2025 . . . . . {Wherein the sleeve is split into two relatively movable parts}

**WARNING**

Group [B23B 31/2025](#) is incomplete pending reclassification of documents from groups [B23B 31/20](#) and [B23B 31/202](#).

Groups [B23B 31/20](#), [B23B 31/202](#), and [B23B 31/2025](#) should be considered in order to perform a complete search.

- 31/204 . . . . . {using fluid-pressure means to actuate the gripping means ([B23B 31/207](#) take precedence)}

- 31/206 . . . . . {Reciprocating cam actuator ([B23B 31/207](#) takes precedence)}

**WARNING**

Group [B23B 31/206](#) is incomplete pending reclassification of documents from groups [B23B 31/20](#) and [B23B 31/201](#).

Groups [B23B 31/20](#), [B23B 31/201](#), and [B23B 31/206](#) should be considered in order to perform a complete search.

- 31/207 . . . . . {using mechanical transmission through the spindle}

**WARNING**

Group [B23B 31/207](#) is impacted by reclassification into groups [B23B 31/2072](#), [B23B 31/2073](#), [B23B 2270/025](#), and [B23B 2270/027](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 31/2072 . . . . . {Axially moving cam, fixed jaws}

**WARNING**

Group [B23B 31/2072](#) is incomplete pending reclassification of documents from groups [B23B 31/20](#), [B23B 31/201](#), and [B23B 31/207](#).

All groups listed in this Warning should be considered in order to perform a complete search.



- 31/2073 . . . . . {Axially fixed cam, moving jaws  
([B23B 31/20125](#) takes precedence)}
- WARNING**
- Group [B23B 31/2073](#)  
is incomplete pending  
reclassification of documents from  
groups [B23B 31/20](#), [B23B 31/201](#),  
and [B23B 31/207](#).
- All groups listed in this Warning  
should be considered in order to  
perform a complete search.
- 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}
- 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](#))}
- 47/32 . . Arrangements for preventing the running-out of drills or fracture of drills when getting through
- 47/34 . . Arrangements for removing chips out of the holes made; Chip-breaking arrangements attached to the tool {(chip-breaking in turning machines [B23B 25/02](#); in turning tools [B23B 27/22](#))}
- 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 . . {Stops attached to drilling tools, tool holders or drilling machines ([B23B 51/104](#) takes precedence)}
- 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](#))}
- 51/0009 . . {Spade drills}
- 51/0018 . . {Drills for enlarging a hole}
- 51/0027 . . . {by tool swivelling}
- 51/0036 . . . {by a tool-carrying eccentric}
- 51/0045 . . . {by expanding or tilting the toolhead}
- 51/0054 . . {Drill guiding devices}
- 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 <a href="#">B28D 1/041</a> )}	2200/0452	. . . rounded
51/0413	. . . {with core-cutting-off devices}	2200/0457	. . Pentagonal
51/042	. . . {with lubricating or cooling equipment}	2200/0461	. . Round
51/0426	. . . {with centering devices}	2200/0466	. . Segment or sector of a circle
51/0433	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}	2200/0471	. . Square
51/044	. . . {with core holding devices}	2200/0476	. . . rounded
51/0446	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}	2200/048	. . Star form
51/0453	. . . {with ejecting devices}	2200/0485	. . Trapezium
51/046	. . . . {with exchangeable cutting inserts, e.g. able to be clamped}	2200/049	. . Triangular
51/0466	. . . {with exchangeable cutting inserts, e.g. able to be clamped}	2200/0495	. . . rounded
51/0473	. . . {details about the connection between the driven shaft and the tubular cutting part}	2200/08	. Rake or top surfaces
51/048	. . {with exchangeable cutting inserts, e.g. able to be clamped ( <a href="#">B23B 51/0493</a> takes precedence)}	2200/081	. . with projections ( <a href="#">chip breaking projections in general B23B 2200/321</a> )
51/0486	. . {with lubricating or cooling equipment ( <a href="#">B23B 51/042</a> takes precedence)}	2200/082	. . with elevated clamping surface
51/0493	. . . {with exchangeable cutting inserts, e.g. able to be clamped}	2200/083	. . curved
51/05	. . for cutting discs from sheet	2200/085	. . discontinuous
51/06	. Drills with lubricating or cooling equipment ( <a href="#">B23B 51/042</a> and <a href="#">B23B 51/0486</a> take precedence)}	2200/086	. . with one or more grooves
51/08	. Drills combined with tool parts or tools for performing additional working ( <a href="#">B23G 5/20</a> takes precedence)}	2200/087	. . . for chip breaking ( <a href="#">chip breaking depressions in general B23B 2200/323</a> , <a href="#">multiple chip breaking grooves B23B 2200/325</a> )
51/10	. Bits for countersinking	2200/088	. . . for clamping
51/101	. . {Deburring tools ( <a href="#">B23B 51/103</a> takes precedence)}	2200/12	. Side or flank surfaces
51/102	. . {Back spot-facing or chamfering}	2200/121	. . with projections
51/103	. . {Deburring or chamfering tools for the ends of tubes or rods}	2200/123	. . curved
51/104	. . {with stops}	2200/125	. . discontinuous
51/105	. . {Deburring or countersinking of radial holes}	2200/126	. . . stepped
51/106	. . {with a toolholder moving along a direction oblique to the axis}	2200/128	. . with one or more grooves
51/107	. . {having a pilot}	2200/16	. Supporting or bottom surfaces
51/108	. . {having a centering twist drill}	2200/161	. . with projections
51/12	. Adapters for drills or chucks; Tapered sleeves	2200/162	. . curved
51/123	. . {Conical reduction sleeves}	2200/163	. . discontinuous
51/126	. . {Tool elongating devices}	2200/164	. . ground
51/14	. . Adapters for broken drills	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 ( <a href="#">with projections on rake surface B23B 2200/081</a> )
		2200/323	. . by chip breaking depressions ( <a href="#">with one or more grooves on top surface for chip breaking B23B 2200/087</a> , <a href="#">with multiple chip breaking grooves B23B 2200/325</a> )
<hr/>			
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		

- 2200/325 . . 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
- 2215/76 . Components for turbines
- 2215/81 . . Turbine blades
- 2220/00 Details of turning, boring or drilling processes**
- 2220/04 . Chamferring ([B23B 2220/28](#) takes precedence)
- 2220/08 . Deburring
- 2220/12 . Grooving
- 2220/123 . . Producing internal grooves
- 2220/126 . . Producing ring grooves
- 2220/24 . Finishing ([roughing and finishing B23B 2220/445](#))
- 2220/28 . Parting off and chamferring simultaneously
- 2220/32 . Drilling holes from both sides
- 2220/36 . Turning, boring or drilling at high speeds
- 2220/40 . Peeling
- 2220/44 . Roughing
- 2220/445 . . and finishing
- 2220/52 . Whirling
- 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 2222/80](#), [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	2228/56	. Two phase materials
<b>2224/00</b>	<b>Materials of tools or workpieces composed of a compound including a metal</b>	2228/61	. Materials comprising whiskers
2224/04	. Aluminium oxide	<b>2229/00</b>	<b>Details of boring bars or boring heads</b>
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	<b>2231/00</b>	<b>Details of chucks, toolholder shanks or tool shanks</b>
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	2231/0212	. . Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred ( <a href="#">break points on tools not in shank area B23B 2210/12, shanks with reduced cross sections in general B23B 2231/0252</a> )
<b>2226/00</b>	<b>Materials of tools or workpieces not comprising a metal</b>	2231/0216	. . Overall cross sectional shape of the shank
2226/04	. Aromatic polyamides	2231/022	. . . Triangular
2226/09	. Asbestos	2231/0224	. . . . Rounded triangular
2226/12	. Boron nitride	2231/0228	. . . Square
2226/125	. . cubic [CBN]	2231/0232	. . . Hexagonal
2226/15	. Cardboard	2231/0236	. . . Octagonal
2226/18	. Ceramic	2231/024	. . . Star form
2226/27	. Composites	2231/0244	. . . Special forms not otherwise provided for
2226/275	. . Carbon fibre reinforced carbon composites	2231/0248	. . Codes for diameters
2226/31	. Diamond	2231/0252	. . Shanks having a section of reduced diameter ( <a href="#">to provide a preferred breaking point B23B 2231/0212</a> )
2226/315	. . polycrystalline [PCD]	2231/0256	. . Flats
2226/33	. Elastomers, e.g. rubber	2231/026	. . Grooves ( <a href="#">keyways B23B 2231/0276</a> )
2226/36	. Epoxy	2231/0264	. . . Axial grooves
2226/39	. Foam	2231/0268	. . . Radial grooves
2226/42	. Gem, i.e. precious stone	2231/0272	. . . Grooves on conical clamping surfaces
2226/45	. Glass ( <a href="#">turning glass B28D 1/16, drilling glass B28D 1/14</a> )	2231/0276	. . Keyways ( <a href="#">axial grooves B23B 2231/0264</a> )
2226/48	. Ice	2231/028	. . Lugs
2226/54	. Paper	2231/0284	. . Notches
2226/57	. Plasterboard, i.e. sheetrock	2231/0288	. . Conical shanks of tools in which the cone is not formed as one continuous surface
2226/61	. Plastics not otherwise provided for, e.g. nylon	2231/0292	. . Flanges of conical shanks
2226/63	. Polyurethane	2231/0296	. . Ends of conical shanks, e.g. pull studs, tangs
2226/66	. Polytetrafluoroethylene	2231/04	. Adapters
2226/69	. Sapphire	2231/06	. Chucks for handtools having means for opening and closing the jaws using the driving motor of the handtool
2226/72	. Silicon carbide	2231/08	. Chucks for shanks of tools having means for reducing the bending of the retained shanks
2226/75	. Stone, rock or concrete ( <a href="#">working of stone B28D</a> )	2231/10	. Chucks having data storage chips
2226/78	. Textile	2231/12	. Chucks having means to amplify the force produced by the actuating means to increase the clamping force
<b>2228/00</b>	<b>Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner</b>	2231/14	. Chucks with clamping force limitation means
2228/04	. applied by chemical vapour deposition [CVD]	2231/20	. Collet chucks
2228/08	. applied by physical vapour deposition [PVD]	2231/2002	. . Collets having blade-like jaws
2228/10	. Coatings	2231/2005	. . Keys preventing rotation
2228/105	. . with specified thickness	2231/2008	. . Bores holding the collet having a slightly conical profile
2228/12	. Abrasive	2231/201	. . Operating surfaces of collets, i.e. the surface of the collet acted on by the operating means
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		



- 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

**WARNING**

Group [B23B 2231/34](#) is impacted by reclassification into groups [B23B 2231/341](#) and [B23B 2231/342](#).

Groups [B23B 2231/34](#), [B23B 2231/341](#), and [B23B 2231/342](#) should be considered in order to perform a complete search.

- 2231/341 . . Jaws with hard inserts

**WARNING**

Group [B23B 2231/341](#) is incomplete pending reclassification of documents from group [B23B 2231/34](#).

Groups [B23B 2231/34](#) and [B23B 2231/341](#) should be considered in order to perform a complete search.

- 2231/342 . . Padded or cushioned jaws

**WARNING**

Group [B23B 2231/342](#) is incomplete pending reclassification of documents from group [B23B 2231/34](#).

Groups [B23B 2231/34](#) and [B23B 2231/342](#) should be considered in order to perform a complete search.

- 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
- 2231/56 . . Chucks with more than one set of gripping means

**WARNING**

Groups [B23B 2231/56](#) and [B23B 2231/565](#) are incomplete pending reclassification of documents from groups [B23B 31/00](#) and [B23B 31/02](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2231/565 . . . Wherein only one means is usable at a time
- 2231/58 . . Self-grasping, i.e., automatic grasping upon insertion of tool or workpiece

**WARNING**

Group [B23B 2231/58](#) is incomplete pending reclassification of documents from groups [B23B 31/00](#) and [B23B 31/02](#).

Groups [B23B 31/00](#), [B23B 31/02](#), and [B23B 2231/58](#) should be considered in order to perform a complete search.

**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

## B23B

2270/025 . . Hydraulics

### **WARNING**

Group [B23B 2270/025](#) is incomplete pending reclassification of documents from group [B23B 31/207](#).

Groups [B23B 31/207](#) and [B23B 2270/025](#) should be considered in order to perform a complete search.

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

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](#))