

CPC**COOPERATIVE PATENT CLASSIFICATION****B23B****TURNING; BORING** (arrangements for copying or controlling B23Q)**WARNING**

[C2012.01]

The following IPC groups are not used in the CPC scheme. Subject matter covered by these 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](#)
[B23B 47/24](#) covered by [B23Q 16/00](#)

Turning**B23B 1/00****Methods for turning or working essentially requiring the use of turning-machines;**

Use of auxiliary equipment in connection with such methods

- B23B 3/00** **General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines**
- B23B 3/02 . Small lathes, e.g. for toolmakers ([specially designed for watchmakers G04D 3/00](#))
- B23B 3/04 . Turning-machines in which the workpiece is rotated by means at a distance from the headstock
- B23B 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](#))
- B23B 3/065 .. {Arrangements for performing other machining operations, e.g. milling, drilling}
- B23B 3/08 . Turning-machines characterised by the use of faceplates
- B23B 3/10 .. with the faceplate horizontal, i.e. vertical boring and turning machines
- B23B 3/12 .. with the faceplate vertical, i.e. face lathes
- B23B 3/14 .. Mountings or drives of faceplates {(rotatable members, e.g. faceplates [B23Q 1/50](#))}
- B23B 3/16 . Turret lathes for turning individually-chucked workpieces {(turrets [B23B 29/24](#))}
- B23B 3/161 .. {lathe with one toolslide carrying one turret head}
- B23B 3/162 ... {Arrangements for performing other machining operations, e.g. milling, drilling}
- B23B 3/164 .. {lathe with one toolslide carrying two or more turret heads}
- B23B 3/165 ... {Arrangements for performing other machining operations, e.g. milling, drilling}
- B23B 3/167 .. {lathe with two or more toolslides carrying turrets}
- B23B 3/168 ... {Arrangements for performing other machining operations, e.g. milling, drilling}
- B23B 3/22 . Turning-machines or devices with rotary tool heads {([B23B 5/08](#), [B23B 5/14](#) and [B23B 5/16](#) take precedence)}
- B23B 3/24 .. the tools of which do not perform a radial movement; Rotary tool heads therefor
- B23B 3/26 .. the tools of which perform a radial movement; Rotary tool heads thereof
- B23B 3/265 ... {Surfacing or grooving flanges}
- B23B 3/30 . Turning-machines with two or more working-spindles, e.g. in fixed arrangement
- B23B 3/32 .. for performing identical operations simultaneously on two or more workpieces
- B23B 3/34 . Short turning-machines with one or multiple working-spindles attended from the end ([B23B 3/12](#) takes precedence)
- B23B 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](#))
- B23B 5/00** **Turning-machines or devices specially adapted for particular work; Accessories specially adapted therefor**

- B23B 5/02 . for turning hubs or brake drums ([B23B 5/04](#) takes precedence)
- B23B 5/04 . for reconditioning hubs or brake drums or axle spindles without removing same from the vehicle
- B23B 5/06 . for turning valves or valve bodies {(turning conical surfaces in general [B23B 5/38](#); tools for working valve seats [B23B 51/106](#))}
- B23B 5/08 . for turning axles, bars, rods, tubes, rolls, i.e. shaft-turning lathes, roll lathes; Centreless turning
- B23B 5/10 . . for turning pilgrim rolls
- B23B 5/12 . . for peeling bars or tubes by making use of cutting bits arranged around the workpiece (otherwise than by turning [B23D 79/12](#))
- B23B 5/14 . Cutting-off lathes (shearing [B23D](#)){[B23D 21/00](#) takes precedence}
- B23B 5/16 . for bevelling, chamfering, or deburring the ends of bars or tubes
- B23B 5/161 . . {Devices attached to the workpiece}
- B23B 5/162 . . . {with an internal clamping device}
- B23B 5/163 . . . {with an external clamping device}
- B23B 5/165 . . {Workpieces clamped on a bench, e.g. a vice}
- B23B 5/166 . . {Devices for working electrodes}
- B23B 5/167 . . {Tools for chamfering the ends of bars or tubes}
- B23B 5/168 . . . {with guiding devices}
- B23B 5/18 . for turning crankshafts, eccentrics, or cams, e.g. crankpin lathes
- B23B 5/20 . . without removing same from the engine
- B23B 5/26 . for simultaneously turning internal and external surfaces of a body
- B23B 5/28 . for turning wheels or wheel sets or cranks thereon, i.e. wheel lathes
- B23B 5/32 . . for reconditioning wheel sets without removing same from the vehicle; Underfloor wheel lathes for railway vehicles
- B23B 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
- B23B 5/365 . . {for toroidal surfaces}
- B23B 5/38 . . for turning conical surfaces inside or outside, e.g. taper pins {(for turning valves or valve bodies [B23B 5/06](#))}
- B23B 5/40 . . for turning spherical surfaces inside or outside
- B23B 5/46 . . for turning helical or spiral surfaces (thread cutting [B23G](#))
- B23B 5/48 . . . for cutting grooves, e.g. oil grooves of helicoidal shape
- B23B 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](#))}

- B23B 7/02 . Automatic or semi-automatic machines for turning of stock
- B23B 7/04 . . Turret machines
- B23B 7/06 . . with sliding headstock
- B23B 7/10 . . Accessories, e.g. guards **{{guards [B23Q 11/08](#) takes precedence}}**
- B23B 7/12 . Automatic or semi-automatic machines for turning of workpieces
- B23B 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](#))**
- B23B 9/005 . **{Spindle carriers: constructional details, drives for the spindles, or the like}**
- B23B 9/02 . Automatic or semi-automatic machines for turning of stock
- B23B 9/08 . Automatic or semi-automatic machines for turning of workpieces
- B23B 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](#)}}****
- B23B 13/00** **Arrangements for automatically conveying or chucking or guiding stock**
- B23B 13/02 . for turning-machines with a single working-spindle
- B23B 13/021 . . **{Feeding device having intermittent movement}**
- B23B 13/022 . . . **{being placed in the spindle}**
- B23B 13/024 **{including two collets}**
- B23B 13/025 . . **{with stock drum}**
- B23B 13/027 . . **{Feeding by pistons under fluid-pressure}**
- B23B 13/028 . . **{the material being fed from a reel}**
- B23B 13/04 . for turning-machines with a plurality of working-spindles
- B23B 13/06 . Arrangements for switching-off the drive of turning-machines after the stock has been completely machined
- B23B 13/08 . Arrangements for reducing vibrations in feeding-passages or for damping noise **(damping noise in general [G10K](#))**
- B23B 13/10 . with magazines for stock
- B23B 13/12 . Accessories, e.g. stops, grippers
- B23B 13/121 . . **{Stops (stops for equipment for precise positioning of tool or work into particular locations not otherwise provided for [B23Q 16/00](#))}**

- B23B 13/123 .. {Grippers, pushers or guiding tubes (arrangements for reducing vibrations in feeding-passages or for damping noise [B23B 13/08](#))}
- B23B 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](#))}
- B23B 13/126 .. {Supports}
- B23B 13/128 .. {Stock rest handling devices, e.g. ejectors}

Components or accessories particularly for turning machines

B23B 23/00 Tailstocks; Centres {(for grinding machines [B24B 41/062](#))}

- B23B 23/005 . {the centres being adjustable}
- B23B 23/02 . Dead centres
- B23B 23/025 .. {the centres being adjustable}
- B23B 23/04 . Live centres
- B23B 23/045 .. {the centres being adjustable}

B23B 25/00 Accessories or auxiliary equipment for turning-machines (for machine tools in general [B23Q](#); cooling or lubricating [B23Q 11/12](#))

- B23B 25/02 . Arrangements for chip-breaking in turning-machines (on cutting tools [B23B 27/22](#))
- B23B 25/04 . Safety guards specially designed for turning machines ({[B23Q 11/08](#) takes precedence;} in general [F16P](#))
- B23B 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](#))
- B23B 25/065 .. {Tool setting height gauges}

B23B 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}

- B23B 27/002 . {with vibration damping means}
- B23B 27/005 . {Geometry of the chip-forming or the clearance planes, e.g. tool angles ([B23B 27/141](#) and [B23B 27/22](#) take precedence)}
- B23B 27/007 . {for internal turning (boring bars [B23B 29/02](#), boring heads [B23B 29/03](#); milling cutters [B23C 5/00](#); reamers [B23D 77/00](#))}
- B23B 27/02 . Cutting tools with straight main part and cutting edge at an angle ([B23B 27/04](#) to [B23B 27/08](#) take precedence)
- B23B 27/04 . Cutting-off tools ([B23B 27/08](#) takes precedence; {toolholders for cutting-off inserts [B23B 29/043](#)})

- B23B 27/045 .. {with chip-breaking arrangements}
- B23B 27/06 . profile cutting tools, i.e. forming-tools
- B23B 27/065 .. {Thread-turning tools}
- B23B 27/08 . Cutting tools with blade- or disc-like main parts {(with disc-like main parts [B23B 27/083](#))}
- B23B 27/083 .. {Cutting tools with disc-like main parts}
- B23B 27/086 .. {with yieldable support for the cutting insert}
- B23B 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](#))}
- B23B 27/12 .. with a continuously-rotated circular cutting edge; holders therefor
- B23B 27/14 . Cutting tools of which the bits or tips {or cutting inserts} are of special material
- B23B 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](#))}
- B23B 27/143 ... {characterised by having chip-breakers}
- B23B 27/145 ... {characterised by having a special shape}
- B23B 27/146 {Means to improve the adhesion between the substrate and the coating}
- B23B 27/148 .. {Composition of the cutting inserts}
- B23B 27/16 .. with exchangeable cutting bits {or cutting inserts}, e.g. able to be clamped
- B23B 27/1603 ... {with specially shaped plate-like exchangeable cutting inserts, e.g. chip-breaking groove ([B23B 27/1614](#) to [B23B 27/1655](#) take precedence)}
- B23B 27/1607 {characterised by having chip-breakers}
- B23B 27/1611 {characterised by having a special shape}
- B23B 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)}
- B23B 27/1618 {characterised by having chip-breakers}
- B23B 27/1622 {characterised by having a special shape}
- B23B 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)}
- B23B 27/1629 {in which the clamping member breaks the chips}
- B23B 27/1633 {in which the chip-breaking clamping member is adjustable}
- B23B 27/1637 {characterised by having chip-breakers}
- B23B 27/164 {characterised by having a special shape}
- B23B 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}
- B23B 27/1648 {characterised by having chip-breakers}
- B23B 27/1651 {characterised by having a special shape}
- B23B 27/1655 ... {Adjustable position of the plate-like cutting inserts of special form}

- B23B 27/1659 . . . {with plate-like exchangeable cutting inserts ([B23B 27/1662](#) to [B23B 27/1681](#) take precedence)}
- B23B 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)}
- B23B 27/1666 . . . {with plate-like cutting inserts clamped by a clamping member acting almost perpendicularly on chip-forming plane ([B23B 27/1677](#) takes precedence)}
- B23B 27/167 {in which the clamping member breaks the chips}
- B23B 27/1674 {in which the chip-breaking clamping member is adjustable}
- B23B 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}
- B23B 27/1681 . . . {Adjustable position of the plate-like cutting inserts}
- B23B 27/1685 . . . {Adjustable position of the cutting inserts ([B23B 27/1655](#) and [B23B 27/1681](#) take precedence)}
- B23B 27/1688 {Height of the cutting tip adjustable}
- B23B 27/1692 {Angular position of the cutting insert adjustable around an axis parallel to the chip-forming plane}
- B23B 27/1696 {Angular position of the cutting insert adjustable around an axis generally perpendicularly to the chip-forming plane}
- B23B 27/18 . . with cutting bits or tips {or cutting inserts} rigidly mounted, e.g. by brazing
- B23B 27/20 . . . with diamond bits {or cutting inserts}
- B23B 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](#))}
- B23B 27/24 . Knurling tools

- B23B 29/00** **Holders for non-rotary cutting tools ([B23B 27/12](#) takes precedence); Boring bars or boring heads; Accessories for tool holders**

- B23B 29/02 . Boring bars
- B23B 29/022 . . {with vibration reducing means}
- B23B 29/025 . . {Boring toolholders fixed on the boring bar}
- B23B 29/027 . . {Steadies for boring bars (auxiliary devices, e.g. steadies, rests [B23Q 1/76](#))}

- B23B 29/03 . Boring heads
- B23B 29/034 . . with tools moving radially, e.g. for making chamfers or undercuttings
- B23B 29/03403 . . . {radially adjustable before starting manufacturing}
- B23B 29/03407 { by means of screws and nuts}
- B23B 29/0341 { Cartridges}
- B23B 29/03414 { adjustment of the tool placed in the hole being possible}
- B23B 29/03417 { by means of inclined planes}
- B23B 29/03421 { by pivoting the tool carriers or by elastic deformation}
- B23B 29/03425 { by means of gears and racks}
- B23B 29/03428 { by means of an eccentric}

- B23B 29/03432 . . . {radially adjustable during manufacturing}
- B23B 29/03435 { by means of screws and nuts}
- B23B 29/03439 { Boring and facing heads}
- B23B 29/03442 { Grooving tool}
- B23B 29/03446 { by means of inclined planes}
- B23B 29/0345 { Boring and facing heads}
- B23B 29/03453 { Grooving tool}
- B23B 29/03457 { by pivoting the tool carriers or by elastic deformation}
- B23B 29/0346 { Boring and facing heads}
- B23B 29/03464 { Grooving tool}
- B23B 29/03467 { by means of gears and racks}
- B23B 29/03471 { Boring and facing heads}
- B23B 29/03475 { Grooving tool}
- B23B 29/03478 { by means of an eccentric}
- B23B 29/03482 { Boring and facing heads}
- B23B 29/03485 { Grooving tool}
- B23B 29/03489 { Adjustment means not specified or not covered by the groups [B23B 29/03435](#) to [B23B 29/03478](#)}
- B23B 29/03492 { Boring and facing heads}
- B23B 29/03496 { Grooving tool}

- B23B 29/04 . . Tool holders for a single cutting tool
- B23B 29/043 . . {with cutting-off, grooving or profile cutting tools, i.e. blade- or disc-like main cutting parts ([B23B 29/14](#) takes precedence)}
- B23B 29/046 . . {with an intermediary toolholder}
- B23B 29/06 . . Tool holders equipped with longitudinally-arranged grooves for setting the cutting tool
- B23B 29/08 . . Tool holders equipped with grooves arranged crosswise to the longitudinal direction for setting the cutting tool
- B23B 29/10 . . . with adjustable counterbase for the cutting tool
- B23B 29/12 . . Special arrangements on tool holders
- B23B 29/125 . . . {Vibratory toolholders}
- B23B 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](#))}
- B23B 29/16 . . . for supporting the workpiece in a backrest
- B23B 29/18 . . . for retracting the cutting tool
- B23B 29/20 . . . for placing same by shanks in sleeves of a turret
- B23B 29/205 {the tools being adjustable}
- B23B 29/22 . . . for tool adjustment by means of shims or spacers

- B23B 29/24 . . Tool holders for a plurality of cutting tools, e.g. turrets {(indexing devices [B23Q 16/00](#))}
- B23B 29/242 . . {Turrets, without description of the angular positioning device (turret lathes for turning individually-chucked workpieces [B23B 3/16](#); turrets with manually operated angular positioning devices [B23B 29/282](#); turrets with power operated angular positioning devices [B23B 29/323](#))}

- B23B 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](#))}
- B23B 29/246 ... {Quick-change tool holders}
- B23B 29/248 .. {with individually adjustable toolholders}
- B23B 29/26 .. Tool holders in fixed position
- B23B 29/28 .. Turrets manually adjustable about a vertical { or horizontal} pivot {(indexing devices [B23Q 16/00](#))}
- B23B 29/282 ... {Turrets with manually operated angular positioning devices}
- B23B 29/285 ... {Toolposts with manually operated angular positioning devices}
- B23B 29/287 ... {Turret toolholder with manually operated angular positioning devices}
- B23B 29/32 .. Turrets adjustable by power drive, i.e. turret heads {(indexing devices [B23Q 16/00](#))}
- B23B 29/323 ... {Turrets with power operated angular positioning devices}
- B23B 29/326 ... {Toolposts with power operated angular positioning devices}
- B23B 29/34 .. Turrets equipped with triggers for releasing the cutting tools

- B23B 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](#))}

- B23B 31/001 . {Protection against entering of chips or dust}
- B23B 31/003 . {Work or tool ejection means}
- B23B 31/005 . {Cylindrical shanks of tools}
- B23B 31/006 . {Conical shanks of tools}
- B23B 31/008 . {with arrangements for transmitting torque}
- B23B 31/02 . Chucks
- B23B 31/021 .. {Faceplates}
- B23B 31/023 .. {for screw-threads}
- B23B 31/025 .. {for gears}
- B23B 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](#))}
- B23B 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](#))}
- B23B 31/06 .. Features relating to the removal of tools; Accessories therefor
- B23B 31/07 ... Ejector wedges
- B23B 31/08 .. Holding tools yieldably
- B23B 31/083 ... {axially}

B23B 31/086 {having an overload clutch}
 B23B 31/10 . . characterised by the retaining or gripping devices or their immediate operating means

NOTE

Group [B23B 31/12](#) takes precedence over groups { [B23B 31/10B](#), [B23B 31/10C](#),} [B23B 31/103](#) to [B23B 31/117](#)

B23B 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](#))}

B23B 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)}

B23B 31/103 . . . Retention by pivotal elements, e.g. catches, pawls

B23B 31/107 . . . Retention by laterally-acting detents, e.g. pins, screws, wedges; Retention by loose elements, e.g. balls

B23B 31/1071 {Retention by balls (balls acting as jaws [B23B 31/22](#))}

B23B 31/1072 {Retention by cylindrical elements (cylindrical elements acting as jaws [B23B 31/22](#))}

B23B 31/1073 {Retention by conical elements (conical elements acting as jaws [B23B 31/22](#))}

B23B 31/1074 {Retention by pins}

B23B 31/1075 {Retention by screws}

B23B 31/1076 {with conical ends}

B23B 31/1077 {acting on a floating pin}

B23B 31/1078 {Retention by wedges}

B23B 31/11 . . . Retention by threaded connection

B23B 31/1107 {for conical parts}

B23B 31/1115 { using conical threads}

B23B 31/1122 { using cylindrical threads}

B23B 31/113 . . . Retention by bayonet connection

B23B 31/117 . . . Retention by friction only, e.g. using springs, resilient sleeves, tapers

B23B 31/1171 {not used, see subgroups and [B23B 31/117](#)}

B23B 31/1172 {using fluid-pressure means to actuate the gripping means}

B23B 31/1173 {using springs}

B23B 31/1174 {using fluid-pressure means to actuate the gripping means}

B23B 31/1175 {using elastomer rings or sleeves}

B23B 31/1176 {using fluid-pressure means to actuate the gripping means}

B23B 31/1177 {using resilient metallic rings or sleeves}

B23B 31/1178 {using fluid-pressure means to actuate the gripping means}

B23B 31/1179 { using heating and cooling}

B23B 31/12 . . . Chucks with simultaneously-acting jaws, whether or not also individually adjustable

B23B 31/1207 {moving obliquely to the axis of the chuck in a plane containing this axis}

B23B 31/1215	.....	{Details of the jaws}
B23B 31/1223	.....	{using fluid-pressure means in the chuck to actuate the gripping means}
B23B 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)}
B23B 31/1238	.....	{Jaws movement actuated by a nut with conical screw-thread}
B23B 31/1246	.....	{Jaws movement actuated by a bolt with conical screw-thread}
B23B 31/1253	.....	{Jaws movement actuated by an axially movable member}
B23B 31/1261	.....	{pivotally movable in a radial plane}
B23B 31/1269	.....	{Details of the jaws}
B23B 31/1276	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/1284	.....	{with a centre}
B23B 31/1292	.....	{using mechanical transmission through the spindle}
B23B 31/14	.....	involving the use of a centrifugal force
B23B 31/16	.....	moving radially
B23B 31/16004	.....	{Jaws movement actuated by one or more spiral grooves}
B23B 31/16008	.....	{Details of the jaws}
B23B 31/16012	.....	{Form of the jaws}
B23B 31/16016	.....	{Fixation on the master jaw}
B23B 31/1602	.....	{Individually adjustable jaws}
B23B 31/16025	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/16029	.....	{using mechanical transmission through the spindle}
B23B 31/16033	.....	{with a centre}
B23B 31/16037	.....	{using mechanical transmission through the spindle (B23B 31/16029 takes precedence)}
B23B 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)}
B23B 31/16045	.....	{Jaws movement actuated by screws and nuts or oblique racks}
B23B 31/1605	.....	{Details of the jaws}
B23B 31/16054	.....	{Form of the jaws}
B23B 31/16058	.....	{Fixation on the master jaw}
B23B 31/16062	.....	{Individually adjustable jaws}
B23B 31/16066	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/1607	.....	{using mechanical transmission through the spindle}
B23B 31/16075	.....	{with a centre}
B23B 31/16079	.....	{using mechanical transmission through the spindle (B23B 31/1607 takes precedence)}
B23B 31/16083	.....	{Jaws movement actuated by gears and racks}
B23B 31/16087	.....	{Details of the jaws}
B23B 31/16091	.....	{Form of the jaws}
B23B 31/16095	.....	{Fixation on the master jaw}
B23B 31/161	.....	{Individually adjustable jaws}
B23B 31/16104	.....	{using fluid-pressure means to actuate the gripping means}

B23B 31/16108	.....	{using mechanical transmission through the spindle}
B23B 31/16112	.....	{with a centre}
B23B 31/16116	.....	{using mechanical transmission through the spindle (B23B 31/16108 takes precedence)}
B23B 31/1612	.....	{Jaws movement actuated by cam surface in a radial plane}
B23B 31/16125	.....	{Details of the jaws}
B23B 31/16129	.....	{Form of the jaws}
B23B 31/16133	.....	{Fixation on the master jaw}
B23B 31/16137	.....	{Individually adjustable jaws}
B23B 31/16141	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/16145	.....	{using mechanical transmission through the spindle}
B23B 31/1615	.....	{with a centre}
B23B 31/16154	.....	{using mechanical transmission through the spindle (B23B 31/16145 takes precedence)}
B23B 31/16158	.....	{Jaws movement actuated by coaxial conical surfaces}
B23B 31/16162	.....	{Details of the jaws}
B23B 31/16166	.....	{Form of the jaws}
B23B 31/1617	.....	{Fixation on the master jaw}
B23B 31/16175	.....	{Individually adjustable jaws}
B23B 31/16179	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/16183	.....	{using mechanical transmission through the spindle}
B23B 31/16187	.....	{with a centre}
B23B 31/16191	.....	{using mechanical transmission through the spindle (B23B 31/16183 takes precedence)}
B23B 31/16195	.....	{Jaws movement actuated by levers moved by a coaxial control rod}
B23B 31/162	.....	{Details of the jaws}
B23B 31/16204	.....	{Form of the jaws}
B23B 31/16208	.....	{Fixation on the master jaw}
B23B 31/16212	.....	{Individually adjustable jaws}
B23B 31/16216	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/1622	.....	{using mechanical transmission through the spindle}
B23B 31/16225	.....	{with a centre}
B23B 31/16229	.....	{using mechanical transmission through the spindle (B23B 31/1622 takes precedence)}
B23B 31/16233	.....	{Jaws movement actuated by oblique surfaces of a coaxial control rod}
B23B 31/16237	.....	{Details of the jaws}
B23B 31/16241	.....	{Form of the jaws}
B23B 31/16245	.....	{Fixation on the master jaw}
B23B 31/1625	.....	{Individually adjustable jaws}
B23B 31/16254	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/16258	.....	{using mechanical transmission through the spindle}
B23B 31/16262	.....	{with a centre}
B23B 31/16266	.....	{using mechanical transmission through the spindle (B23B 31/16258 takes precedence)}

		takes precedence)}
B23B 31/1627	.....	{Details of the jaws}
B23B 31/16275	.....	{Form of the jaws}
B23B 31/16279	.....	{Fixation on the master jaw}
B23B 31/16283	.....	{Individually adjustable jaws}
B23B 31/16287	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/16291	.....	{with a centre}
B23B 31/16295	.....	{with means preventing the ejection of the jaws}
B23B 31/18	....	pivotally movable in planes containing the axis of the chuck
B23B 31/185	.....	{moving first parallel to the axis then pivotally in planes containing the axis of the chuck}
B23B 31/19	....	moving parallel to the axis of the chuck {(B23B 31/185 takes precedence)}
B23B 31/20	....	Longitudinally-split sleeves, e.g. collet chucks
B23B 31/201	.....	{characterised by features relating primarily to remote control of the gripping means}
B23B 31/202	.....	{Details of the jaws}
B23B 31/204	.....	{using fluid-pressure means to actuate the gripping means}
B23B 31/205	.....	{using mechanical transmission through the spindle}
B23B 31/207	.....	{using mechanical transmission through the spindle (B23B 31/205 takes precedence)}
B23B 31/208	.....	{ with a tool positioning stop (axial positioning of the tool being adjustable B23B 31/028)}
B23B 31/22	....	Jaws in the form of balls {(retention by balls B23B 31/1071)}
B23B 31/223	.....	{Jaws in the form of cylindrical elements (Retention by cylindrical elements B23B 31/1072)}
B23B 31/226	.....	{Jaws in the form of conical elements (Retention by conical elements B23B 31/1073)}
B23B 31/24	..	characterised by features relating primarily to remote control of the gripping means {(B23B 31/201 takes precedence)}
B23B 31/26	...	using mechanical transmission through the working-spindle {(B23B 31/16 and B23B 31/40 take precedence)}
B23B 31/261	....	{clamping the end of the toolholder shank}
B23B 31/263	.....	{by means of balls}
B23B 31/265	.....	{by means of collets}
B23B 31/266	.....	{using a threaded spindle}
B23B 31/268	.....	{using a bayonet connection}
B23B 31/28	...	using electric or magnetic means in the chuck
B23B 31/30	...	using fluid-pressure means in the chuck {(B23B 31/10 and B23B 31/40 take precedence)}
B23B 31/302	....	{Hydraulic equipment, e.g. pistons, valves, rotary joints}
B23B 31/305	....	{the gripping means is a deformable sleeve}
B23B 31/307	....	{Vacuum chucks}
B23B 31/32	..	with jaws carried by diaphragm
B23B 31/34	..	with means enabling the workpiece to be reversed or tilted

- B23B 31/36 .. with means for adjusting the chuck with respect to the working-spindle
- B23B 31/38 .. with overload clutches [{\(B23B 31/086 takes precedence\)}](#)
- B23B 31/39 .. Jaw changers

- B23B 31/40 . Expansion mandrels
- B23B 31/4006 .. [{Gripping the work or tool by a split sleeve \(collet chucks B23B 31/20\)}](#)
- B23B 31/4013 ... [{Details of the jaws}](#)
- B23B 31/402 .. [{using fluid-pressure means to actuate the gripping means}](#)
- B23B 31/4026 [{using mechanical transmission through the spindle}](#)
- B23B 31/4033 .. [{using mechanical transmission through the spindle \(B23B 31/4026 takes precedence\)}](#)

- B23B 31/404 .. [{Gripping the work or tool by jaws moving radially controlled by conical surfaces \(see also B23B 31/16158\)}](#)
- B23B 31/4046 ... [{Details of the jaws}](#)
- B23B 31/4053 .. [{using fluid-pressure means to actuate the gripping means}](#)
- B23B 31/406 [{using mechanical transmission through the spindle}](#)
- B23B 31/4066 .. [{using mechanical transmission through the spindle \(B23B 31/406 takes precedence\)}](#)

- B23B 31/4073 .. [{Gripping the work or tool between planes almost perpendicular to the axis}](#)
- B23B 31/408 .. [{Work or tool supported by two conical surfaces}](#)
- B23B 31/4086 .. [{Work or tool gripped by a roller movable on an inclined plane}](#)
- B23B 31/4093 .. [{Tube supporting means including a centerhole}](#)
- B23B 31/42 .. characterised by features relating primarily to remote control of the gripping means

B23B 33/00 Drivers; Driving centres, Nose clutches, e.g. lathe dogs

- B23B 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](#))

B23B 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

- B23B 35/005 . [{Measures for preventing splintering}](#)

B23B 37/00 Boring by making use of ultrasonic energy (essentially using abrasive material [B24B](#), e.g. [B24B 1/04](#))

B23B 39/00 General-purpose boring or drilling machines or devices; Sets of boring and/or drilling machines

- B23B 39/003 . [{Drilling machine situated underneath the workpiece}](#)
- B23B 39/006 . [{Portal drilling machines}](#)

- B23B 39/02 . Boring machines; Combined horizontal boring and milling machines
- B23B 39/04 . Co-ordinate boring or drilling machines; Machines for making holes without previous marking
- B23B 39/06 .. Equipment for positioning work
- B23B 39/08 .. Devices for programme control
- B23B 39/10 . characterised by the drive, e.g. by fluid-pressure drive pneumatic power drive
- B23B 39/12 . Radial drilling machines
- B23B 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
- B23B 39/16 . Drilling machines with a plurality of working-spindles; Drilling automatons
- B23B 39/161 .. {with parallel work spindles}
- B23B 39/162 ... {having gear transmissions}
- B23B 39/163 ... {having crank pin transmissions}
- B23B 39/165 ... {having universal joint transmissions}
- B23B 39/166 ... {having flexible shaft transmissions}
- B23B 39/167 ... {having belt and chain transmissions}
- B23B 39/168 .. {with the work spindles being oblique to each other}
- B23B 39/18 .. Setting work or tool carrier along a straight index line
- B23B 39/20 .. Setting work or tool carrier along a circular index line; Turret head drilling machines
- B23B 39/205 ... {Turret head drilling machines}
- B23B 39/22 .. with working-spindles in opposite headstocks
- B23B 39/24 .. designed for programme control
- B23B 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](#))
- B23B 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](#))
- B23B 41/00** **Boring or drilling machines or devices specially adapted for particular work**
{([surgical drilling machines A61B 17/16M](#))}; **Accessories specially adapted therefor**
- B23B 41/003 . {for drilling elongated pieces, e.g. beams}
- B23B 41/006 .. {the machining device being moved along a fixed workpiece}
- B23B 41/02 . for boring deep holes; Trepanning, e.g. of gun or rifle barrels
- B23B 41/04 . for boring polygonal or other non-circular holes
- B23B 41/06 . for boring conical holes
- B23B 41/10 . for boring holes in steam boilers

- B23B 41/12 . for forming working surfaces of cylinders, of bearings, e.g. in heads of driving rods, or of other engine parts
- B23B 41/14 . for very small holes
- B23B 41/16 . for boring holes with high-quality surface
- B23B 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](#))**
- B23B 43/02 . to the tailstock of a lathe
- B23B 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](#))**
- B23B 45/001 . {Housing of the drill, e.g. handgrip}
- B23B 45/003 . {Attachments}
- B23B 45/005 . . {Flexible shafts}
- B23B 45/006 . {Keys for operating the chucks}
- B23B 45/008 . {Gear boxes, clutches, bearings, feeding mechanisms or like equipment}
- B23B 45/02 . driven by electric power
- B23B 45/04 . driven by fluid-pressure or pneumatic power
- B23B 45/042 . . {Turbine motors}
- B23B 45/044 . . {Rotary vane type motors}
- B23B 45/046 . . {Piston engines}
- B23B 45/048 . . . {Internal combustion piston engines}
- B23B 45/06 . driven by man-power
- B23B 45/08 . . for drilling rails or profiled stock
- B23B 45/10 . . by using a fiddle bow or a belt
- B23B 45/12 . . by using a ratchet brace

Components or accessories for boring or drilling machines

- B23B 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](#))**
- B23B 47/26 . Lifiable or lowerable drill heads or headstocks; Balancing arrangements therefor {(weight and flexion compensation [B23Q 11/001](#))}

- B23B 47/28 . Drill jigs for workpieces ([equipment for setting or guiding the drill B23B 49/00](#))
- B23B 47/281 .. {Jigs for drilling cylindrical parts}
- B23B 47/282 .. {Jigs for drilling spherical parts}
- B23B 47/284 .. {Jigs for drilling rivets or bolts}
- B23B 47/285 .. {Jigs for drilling ski bindings}
- B23B 47/287 .. {Jigs for drilling plate-like workpieces ([templates for marking the position of fittings on wings or frames E05D 11/0009](#))}
- B23B 47/288 ... {involving dowelling}

- B23B 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](#))}

- B23B 47/32 . Arrangements for preventing the running-out of drills or fracture of drills when getting through

- B23B 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](#))}

- B23B 49/00** **Measuring or gauging equipment on boring machines for positioning or guiding the drill; Devices for indicating failure of drills during boring; Centering devices for holes to be bored ([marking-out equipment B25H 7/00](#); [measuring devices, gauges G01B](#))**

- B23B 49/001 . {Devices for detecting or indicating failure of drills}
- B23B 49/003 . {Stops attached to drilling tools, tool holders or drilling machines ([B23B 51/104](#) takes precedence)}
- B23B 49/005 .. {Attached to the drill}
- B23B 49/006 .. {Attached to drilling machines}
- B23B 49/008 ... {Attached to the nose of the drilling machines}

- B23B 49/02 . Boring templates or bushings
- B23B 49/023 .. {Bushings and their connection to the template}
- B23B 49/026 .. {Boring bushing carriers attached to the workpiece by glue, magnets, suction devices or the like}

- B23B 49/04 . Devices for boring or drilling centre holes in workpieces

- B23B 49/06 . Devices for drilling holes in brake bands or brake linings

- B23B 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](#))}**

- B23B 51/0009 . {Spade drills}

- B23B 51/0018 . {Drills for enlarging a hole}
- B23B 51/0027 .. {by tool swivelling}
- B23B 51/0036 .. {by a tool-carrying eccentric}
- B23B 51/0045 .. {by expanding or tilting the toolhead}

- B23B 51/0054 . {Drill guiding devices}

- B23B 51/0063 . {Centerdrills}

- B23B 51/0072 . {Drills for making non-circular holes}

- B23B 51/0081 . {Conical drills}

- B23B 51/009 . {Stepped drills}

- B23B 51/02 . Twist drills

- B23B 51/04 . Drills for trepanning
- B23B 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](#))}
- B23B 51/0413 ... {with core-cutting-off devices}
- B23B 51/042 ... {with lubricating or cooling equipment}
- B23B 51/0426 ... {with centering devices}
- B23B 51/0433 {with exchangeable cutting inserts, e.g. able to be clamped}
- B23B 51/044 ... {with core holding devices}
- B23B 51/0446 {with exchangeable cutting inserts, e.g. able to be clamped}
- B23B 51/0453 ... {with ejecting devices}
- B23B 51/046 {with exchangeable cutting inserts, e.g. able to be clamped}
- B23B 51/0466 ... {with exchangeable cutting inserts, e.g. able to be clamped}
- B23B 51/0473 ... {details about the connection between the driven shaft and the tubular cutting part}
- B23B 51/048 .. {with exchangeable cutting inserts, e.g. able to be clamped ([B23B 51/0493](#) takes precedence)}
- B23B 51/0486 .. {with lubricating or cooling equipment ([B23B 51/042](#) takes precedence)}
- B23B 51/0493 ... {with exchangeable cutting inserts, e.g. able to be clamped}
- B23B 51/05 .. for cutting discs from sheet

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

- B23B 51/08 . Drills combined with tool parts or tools for performing additional working {([B23G 5/20](#) takes precedence)}

- B23B 51/10 . Bits for countersinking
- B23B 51/101 .. {Deburring tools ([B23B 51/103](#) takes precedence)}
- B23B 51/102 .. {Back spot-facing or chamfering}

- B23B 51/103 .. {Deburring or chamfering tools for the ends of tubes or rods}
- B23B 51/104 .. {with stops}
- B23B 51/105 .. {Deburring or countersinking of radial holes}
- B23B 51/106 .. {with a toolholder moving along a direction oblique to the axis}
- B23B 51/107 .. {having a pilot}
- B23B 51/108 .. {having a centering twist drill}

- B23B 51/12 . Adapters for drills or chucks; Tapered sleeves
- B23B 51/123 .. {Conical reduction sleeves}
- B23B 51/126 .. {Tool elongating devices}
- B23B 51/14 .. Adapters for broken drills

B23B 2200/00 **Details of cutting inserts**

- B23B 2200/04 . Overall shape
- B23B 2200/0404 .. Hexagonal
- B23B 2200/0409 ... irregular
- B23B 2200/0414 ... rounded
- B23B 2200/0419 ... trigonal
- B23B 2200/0423 .. Irregular
- B23B 2200/0428 .. Lozenge
- B23B 2200/0433 ... rounded
- B23B 2200/0438 .. Octagonal
- B23B 2200/0442 ... rounded
- B23B 2200/0447 .. Parallelogram
- B23B 2200/0452 ... rounded
- B23B 2200/0457 .. Pentagonal
- B23B 2200/0461 .. Round
- B23B 2200/0466 .. Segment or sector of a circle
- B23B 2200/0471 .. Square
- B23B 2200/0476 ... rounded
- B23B 2200/048 .. Star form
- B23B 2200/0485 .. Trapezium
- B23B 2200/049 .. Triangular
- B23B 2200/0495 ... rounded

- B23B 2200/08 . Rake or top surfaces
- B23B 2200/081 .. with projections ([chip breaking projections in general B23B 2200/321](#))
- B23B 2200/082 .. with elevated clamping surface
- B23B 2200/083 .. curved
- B23B 2200/085 .. discontinuous

- B23B 2200/086 .. with one or more grooves
- B23B 2200/087 ... for chip breaking (chip breaking depressions in general [B23B 2200/323](#), multiple chip breaking grooves [B23B 2200/325](#))
- B23B 2200/088 ... for clamping

- B23B 2200/12 . Side or flank surfaces
- B23B 2200/121 .. with projections
- B23B 2200/123 .. curved
- B23B 2200/125 .. discontinuous
- B23B 2200/126 ... stepped
- B23B 2200/128 .. with one or more grooves

- B23B 2200/16 . Supporting or bottom surfaces
- B23B 2200/161 .. with projections
- B23B 2200/162 .. curved
- B23B 2200/163 .. discontinuous
- B23B 2200/164 .. ground
- B23B 2200/165 .. with one or more grooves
- B23B 2200/166 .. polygonal
- B23B 2200/167 .. with serrations
- B23B 2200/168 .. star form

- B23B 2200/20 . Top or side views of the cutting edge
- B23B 2200/201 .. Details of the nose radius and immediately surrounding area
- B23B 2200/202 .. with curved cutting edge
- B23B 2200/204 .. with discontinuous cutting edge
- B23B 2200/205 .. with cutting edge having a wave form
- B23B 2200/207 .. for cutting a particular form corresponding to the form of the cutting edge
- B23B 2200/208 .. with wiper, i.e. an auxiliary cutting edge to improve surface finish

- B23B 2200/24 . Cross section of the cutting edge
- B23B 2200/242 .. bevelled or chamfered
- B23B 2200/245 .. rounded
- B23B 2200/247 .. sharp

- B23B 2200/28 . Angles
- B23B 2200/283 .. Negative cutting angles
- B23B 2200/286 .. Positive cutting angles

- B23B 2200/32 . Chip breaking or chip evacuation
- B23B 2200/321 .. by chip breaking projections (with projections on rake surface [B23B 2200/081](#))
- B23B 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](#))
- B23B 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](#))

- B23B 2200/326 .. by chip breaking-plates
- B23B 2200/328 .. Details of chip evacuation

- B23B 2200/36 . Other features of cutting inserts not covered by [B23B 2200/04](#) to [B23B 2200/32](#)
- B23B 2200/3609 .. Chamfers
- B23B 2200/3618 .. Fixation holes
- B23B 2200/3627 .. Indexing (with grooves on bottom surfaces [B23C 2200/165](#), with polygonal bottom surfaces [L23C 200/16F](#), with star form bottom surfaces [B23C 2200/167](#))
- B23B 2200/3636 ... with cutting geometries differing according to the indexed position
- B23B 2200/3645 .. Lands, i.e. the outer peripheral section of the rake face
- B23B 2200/3654 ... being variable (negative lands of variable width [B23B 2200/3672](#))
- B23B 2200/3663 ... having negative cutting angles (with bevelled cutting edge [B23C 2200/243](#))
- B23B 2200/3672 being variable (lands with variable width [B23B 2200/3654](#))
- B23B 2200/3681 .. Split inserts, i.e. comprising two or more sections roughly equal in size and having similar or dissimilar cutting geometries
- B23B 2200/369 .. Mounted tangentially, i.e. where the rake face is not the face with the largest area

B23B 2205/00 **Fixation of cutting inserts in holders**

- B23B 2205/02 . Fixation using an elastically deformable clamping member
- B23B 2205/04 . Fixation screws, bolts or pins of particular form
- B23B 2205/045 .. orientated obliquely to the hole in the insert or to the seating surface

- B23B 2205/08 . using an eccentric

- B23B 2205/10 . using two or more fixation screws

- B23B 2205/12 . Seats for cutting inserts
- B23B 2205/125 .. One or more walls of the seat being elastically deformable

- B23B 2205/16 . Shims

- B23B 2205/18 . Systems for indexing the cutting insert automatically

- B23B 2205/21 . Systems for changing the cutting insert automatically
- B23B 2205/215 .. using a magazine

B23B 2210/00 **Details of turning tools**

- B23B 2210/02 . Tool holders having multiple cutting inserts
- B23B 2210/022 .. Grooving tools
- B23B 2210/025 ... Grooving inserts arranged on a turret
- B23B 2210/027 ... Means for adjusting the grooving inserts

- B23B 2210/04 . Self-sharpening tools
- B23B 2210/06 . Chip breakers
- B23B 2210/08 . Tools comprising intermediary toolholders
- B23B 2210/12 . Tools comprising weakened spot on the tool at a preferred breakage location ([break points on shanks of tools B23B 2231/0212](#))

- B23B 2215/00 **Details of workpieces****
- B23B 2215/04 . Aircraft components
- B23B 2215/08 . Automobile wheels
- B23B 2215/10 . Ammunition cartridge cases
- B23B 2215/12 . Bearing races
- B23B 2215/16 . Camshafts
- B23B 2215/20 . Crankshafts
- B23B 2215/24 . Components of internal combustion engines ([B23B 2215/16](#) and [B23B 2215/20](#) take precedence)
- B23B 2215/242 .. Cylinder liners
- B23B 2215/245 .. Pistons
- B23B 2215/247 .. Piston rings
- B23B 2215/28 . Firearms, guns
- B23B 2215/32 . Railway tracks
- B23B 2215/36 . Railway wheels
- B23B 2215/40 . Spectacles
- B23B 2215/56 . Springs
- B23B 2215/60 . Steel wool
- B23B 2215/64 . Thin walled components
- B23B 2215/68 . Threaded components
- B23B 2215/72 . Tubes, pipes
- B23B 2215/76 . Components for turbines
- B23B 2215/81 .. Turbine blades

B23B 2220/00 **Details of turning, boring or drilling processes**

- B23B 2220/04 . Chamferring ([B23B 2220/28](#) takes precedence)
- B23B 2220/08 . Deburring
- B23B 2220/12 . Grooving
- B23B 2220/123 . . Producing internal grooves
- B23B 2220/126 . . Producing ring grooves
- B23B 2220/24 . Finishing ([roughing and finishing B23B 2220/445](#))
- B23B 2220/28 . Parting off and chamferring simultaneously
- B23B 2220/32 . Drilling holes from both sides
- B23B 2220/36 . Turning, boring or drilling at high speeds
- B23B 2220/40 . Peeling
- B23B 2220/44 . Roughing
- B23B 2220/445 . . and finishing
- B23B 2220/52 . Whirling

B23B 2222/00 **Materials of tools or workpieces composed of metals, alloys or metal matrices**

- B23B 2222/04 . Aluminium
- B23B 2222/12 . Brass
- B23B 2222/14 . Cast iron ([iron B23B 2222/44](#))
- B23B 2222/16 . Cermet
- B23B 2222/21 . Copper
- B23B 2222/24 . Gold
- B23B 2222/28 . Details of hard metal, i.e. cemented carbide
- B23B 2222/32 . Details of high speed steel ([stainless steel B23B 2222/80](#), [steel B23B 2222/84](#))
- B23B 2222/36 . Nickel chrome alloys, e.g. Inconel®
- B23B 2222/41 . Nickel steel alloys, e.g. invar®
- B23B 2222/44 . Iron ([cast iron B23B 2222/14](#))

- B23B 2222/48 . Lead
- B23B 2222/52 . Magnesium
- B23B 2222/56 . Non-specified metals
- B23B 2222/61 . Metal matrices with non-metallic particles or fibres
- B23B 2222/64 . Nickel
- B23B 2222/68 . Palladium
- B23B 2222/72 . Platinum
- B23B 2222/76 . Silver
- B23B 2222/80 . Stainless steel (high speed steel [B23B 2222/32](#), steel [B23B 2222/84](#))
- B23B 2222/84 . Steel (high speed steel [B23B 2222/32](#), stainless steel [B23B 2222/80](#))
- B23B 2222/88 . Titanium
- B23B 2222/92 . Tungsten
- B23B 2222/98 . Zinc

B23B 2224/00 Materials of tools or workpieces composed of a compound including a metal

- B23B 2224/04 . Aluminium oxide
- B23B 2224/08 . Aluminium nitride
- B23B 2224/12 . Chromium carbide
- B23B 2224/16 . Molybdenum disulphide
- B23B 2224/20 . Tantalum carbide
- B23B 2224/24 . Titanium aluminium nitride
- B23B 2224/28 . Titanium carbide
- B23B 2224/32 . Titanium carbide nitride (TiCN)
- B23B 2224/36 . Titanium nitride
- B23B 2224/40 . Tungsten disulphide

B23B 2226/00 Materials of tools or workpieces not comprising a metal

B23B 2226/04	. Aromatic polyamides
B23B 2226/09	. Asbestos
B23B 2226/12	. Boron nitride
B23B 2226/125	. . cubic (CBN)
B23B 2226/15	. Cardboard
B23B 2226/18	. Ceramic
B23B 2226/27	. Composites
B23B 2226/275	. . Carbon fibre reinforced carbon composites
B23B 2226/31	. Diamond
B23B 2226/315	. . polycrystalline (PCD)
B23B 2226/33	. Elastomers, e.g. rubber
B23B 2226/36	. Epoxy
B23B 2226/39	. Foam
B23B 2226/42	. Gem, i.e. precious stone
B23B 2226/45	. Glass (turning glass B28D 1/16 , drilling glass B28D 1/14)
B23B 2226/48	. Ice
B23B 2226/54	. Paper
B23B 2226/57	. Plasterboard, i.e. sheetrock
B23B 2226/61	. Plastics not otherwise provided for, e.g. nylon
B23B 2226/63	. Polyurethane
B23B 2226/66	. Polytetrafluoroethylene
B23B 2226/69	. Sapphire
B23B 2226/72	. Silicon carbide
B23B 2226/75	. Stone, rock or concrete (working of stone B28D)
B23B 2226/78	. Textile
B23B 2228/00	Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner

- B23B 2228/04 . applied by chemical vapour deposition (CVD)
- B23B 2228/08 . applied by physical vapour deposition (PVD)
- B23B 2228/10 . Coatings
- B23B 2228/105 . . with specified thickness
- B23B 2228/12 . Abrasive
- B23B 2228/16 . Shape memory alloys
- B23B 2228/21 . Cast, i.e. In the form of a casting
- B23B 2228/24 . Hard, i.e. after being hardened
- B23B 2228/28 . Soft
- B23B 2228/32 . Explosive
- B23B 2228/36 . Multi-layered
- B23B 2228/41 . Highly conductive
- B23B 2228/44 . Materials having grain size less than 1 micrometre, e.g. nano-crystalline
- B23B 2228/48 . Self-luminous, i.e. light-emitting, e.g. fluorescent
- B23B 2228/52 . Solid lubricants
- B23B 2228/56 . Two phase materials
- B23B 2228/61 . Materials comprising whiskers

B23B 2229/00 Details of boring bars or boring heads

- B23B 2229/04 . Guiding pads
- B23B 2229/08 . Cutting edges of different lengths or at different axial positions
- B23B 2229/12 . Cutting inserts located on different radii
- B23B 2229/16 . Boring, facing or grooving heads with integral electric motor

B23B 2231/00 Details of chucks, toolholder shanks or tool shanks

- B23B 2231/02 . Features of shanks of tools not relating to the operation performed by the tool
- B23B 2231/0204 . . Connection of shanks to working elements of tools
- B23B 2231/0208 . . Bores

- B23B 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](#))
- B23B 2231/0216 .. Overall cross sectional shape of the shank (*not used*)
- B23B 2231/022 ... Triangular
- B23B 2231/0224 Rounded triangular
- B23B 2231/0228 ... Square
- B23B 2231/0232 ... Hexagonal
- B23B 2231/0236 ... Octagonal
- B23B 2231/024 ... Star form
- B23B 2231/0244 ... Special forms not otherwise provided for
- B23B 2231/0248 .. Codes for diameters
- B23B 2231/0252 .. Shanks having a section of reduced diameter ([to provide a preferred breaking point B23B 2231/0212](#))
- B23B 2231/0256 .. Flats
- B23B 2231/026 .. Grooves ([keyways B23B 2231/0276](#))
- B23B 2231/0264 ... Axial grooves
- B23B 2231/0268 ... Radial grooves
- B23B 2231/0272 ... Grooves on conical clamping surfaces
- B23B 2231/0276 .. Keyways ([axial grooves B23B 2231/0264](#))
- B23B 2231/028 .. Lugs
- B23B 2231/0284 .. Notches
- B23B 2231/0288 .. Conical shanks of tools in which the cone is not formed as one continuous surface
- B23B 2231/0292 .. Flanges of conical shanks
- B23B 2231/0296 .. Ends of conical shanks, e.g. pull studs, tangs
- B23B 2231/04 . Adapters
- B23B 2231/06 . Chucks for handtools having means for opening and closing the jaws using the driving motor of the handtool
- B23B 2231/08 . Chucks for shanks of tools having means for reducing the bending of the retained shanks
- B23B 2231/10 . Chucks having data storage chips
- B23B 2231/12 . Chucks having means to amplify the force produced by the actuating means to increase the clamping force
- B23B 2231/14 . Chucks with clamping force limitation means
- B23B 2231/20 . Collet chucks
- B23B 2231/2002 .. Collets having blade-like jaws
- B23B 2231/2005 .. Keys preventing rotation
- B23B 2231/2008 .. Bores holding the collet having a slightly conical profile
- B23B 2231/201 .. Operating surfaces of collets, i.e. the surface of the collet acted on by the operating means

- B23B 2231/2013 . . . Non-cylindrical ([polygonal L231/20H3](#))
- B23B 2231/2016 . . . Polygonal
- B23B 2231/2018 . . . with a saw-tooth profile
- B23B 2231/2021 . . . comprising two different cones
- B23B 2231/2024 . . Non-circular surfaces of collets for the transmission of torque
- B23B 2231/2027 . . Gripping surfaces, i.e. the surface contacting the tool or workpiece
- B23B 2231/2029 . . . Conical
- B23B 2231/2032 . . . with non-cylindrical cross section
- B23B 2231/2035 . . . Polygonal
- B23B 2231/2037 . . . Roughened
- B23B 2231/204 . . . with saw tooth profiles
- B23B 2231/2043 . . . Discontinuous, interrupted or split
- B23B 2231/2045 . . . comprising two or more diameters, e.g. stepped
- B23B 2231/2048 . . Collets comprising inserts
- B23B 2231/2051 . . . brazed in position
- B23B 2231/2054 . . . glued in position
- B23B 2231/2056 . . . where the insert forms part of the surface gripping the workpiece or tool
- B23B 2231/2059 . . . Hard inserts
- B23B 2231/2062 . . . Inserts mechanically clamped in the collet
- B23B 2231/2064 . . . Inserts in the form of a roll
- B23B 2231/2067 . . . Soft inserts
- B23B 2231/207 . . . Inserts welded in position
- B23B 2231/2072 . . Jaws of collets
- B23B 2231/2075 . . . of special form
- B23B 2231/2078 . . Jaw carriers, i.e. components retaining the collet itself
- B23B 2231/2081 . . Keys, spanners or wrenches to operate the collet chuck
- B23B 2231/2083 . . Collets comprising screw threads
- B23B 2231/2086 . . Collets in which the jaws are formed as separate elements, i.e. not joined together
- B23B 2231/2089 . . Slits of collets
- B23B 2231/2091 . . . extending from both axial ends of the collet
- B23B 2231/2094 . . . Helical
- B23B 2231/2097 . . . having a special form not otherwise provided for

- B23B 2231/22 . . Compensating chucks, i.e. with means for the compensation of irregularities of form or position

- B23B 2231/24 . . Cooling or lubrication means

- B23B 2231/26 . . Detection of clamping ([in general B23Q 17/006](#))

- B23B 2231/28 . . Dust covers ([nose pieces in chucks B23B 2231/44](#), [dust covers for turning, boring or drilling in general L23B 260/58](#))

- B23B 2231/30 . . Chucks with four jaws

- B23B 2231/32 . Guideways for jaws
- B23B 2231/34 . Jaws
- B23B 2231/345 . . Different jaws
- B23B 2231/36 . Sealed joints
- B23B 2231/365 . . using O-rings
- B23B 2231/38 . Keyless chucks for hand tools
- B23B 2231/40 . Chucks having a pivotal retention element in the form of a laterally acting cam
- B23B 2231/42 . Chucks operated by a motor which is movable to engage with, or disengage from, the chuck operating means
- B23B 2231/44 . Nose pieces ([dust covers in chucks B23B 2231/28](#), [dust covers for turning, boring or drilling in general L23B 260/58](#))
- B23B 2231/46 . Pins
- B23B 2231/48 . Polygonal cross sections
- B23B 2231/50 . Devices to counteract clamping forces exerted within the spindle in order to release the tool or workpiece
- B23B 2231/52 . Chucks with means to loosely retain the tool or workpiece in the unclamped position
- B23B 2231/54 . Chucks for taps
- B23B 2233/00 **Details of centres or drivers****
- B23B 2233/04 . Means to allow the facing of the axial end of the workpiece near the axis of rotation
- B23B 2233/08 . Centres or drivers comprising a ball
- B23B 2233/12 . Centres or drivers with a special arrangement of bearings or with special bearings
- B23B 2233/16 . Centres or drivers comprising chucks
- B23B 2233/20 . Centres or drivers with convex surfaces
- B23B 2233/24 . Centres or drivers with inserts
- B23B 2233/28 . Centres or drivers supporting the workpiece at three points around the circumference
- B23B 2233/32 . Yieldable centres
- B23B 2235/00 **Turning of brake discs, drums or hubs****

- B23B 2235/04 . Machining of brake discs
- B23B 2235/045 . . Simultaneous machining of both sides of the brake disc
- B23B 2235/12 . Machining of brake drums
- B23B 2235/16 . Machining of hubs
- B23B 2235/21 . Compensation of run out

B23B 2240/00 Details of connections of tools or workpieces

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

B23B 2247/00 Details of drilling jigs

- B23B 2247/02 . Jigs for drilling spectacles ([machines for drilling spectacle lenses B28D 1/143](#))
- B23B 2247/04 . Jigs using one or more holes as datums for drilling further holes
- B23B 2247/06 . Jigs for drilling holes for lock sets for doors
- B23B 2247/08 . Jigs for drilling overlapping or interfering holes
- B23B 2247/10 . Jigs for drilling inclined holes
- B23B 2247/12 . Drilling jigs with means to affix the jig to the workpiece
- B23B 2247/14 . Jigs for drilling flanges
- B23B 2247/16 . Jigs for drilling stairs and associated components, e.g. banisters or handrails
- B23B 2247/18 . Jigs comprising V-blocks

- B23B 2247/20 . Jigs for drilling holes for lock wires in bolts or nuts
- B23B 2250/00 **Compensating adverse effects during turning, boring or drilling****
- B23B 2250/04 . Balancing rotating components ([vibration damping B23B 2250/16](#))
- B23B 2250/08 . Compensation of centrifugal force ([use of centrifugal force B23B 2270/04](#))
- B23B 2250/12 . Cooling and lubrication
- B23B 2250/125 .. Improving heat transfer away from the working area of the tool by conduction
- B23B 2250/16 . Damping of vibrations ([balancing rotating components B23B 2250/04](#))
- B23B 2251/00 **Details of tools for drilling machines****
- B23B 2251/02 . Connections between shanks and removable cutting heads
- B23B 2251/04 . Angles, e.g. cutting angles
- B23B 2251/043 .. Helix angles
- B23B 2251/046 ... Variable
- B23B 2251/08 . Side or plan views of cutting edges
- B23B 2251/082 .. Curved cutting edges
- B23B 2251/085 .. Discontinuous or interrupted cutting edges
- B23B 2251/087 .. Cutting edges with a wave form
- B23B 2251/12 . Cross sectional views of the cutting edges
- B23B 2251/122 .. Bevelled cutting edges
- B23B 2251/125 .. Rounded cutting edges
- B23B 2251/127 .. Sharp cutting edges
- B23B 2251/14 . Configuration of the cutting part, i.e. the main cutting edges
- B23B 2251/18 . Configuration of the drill point
- B23B 2251/20 . Number of cutting edges
- B23B 2251/201 .. Single cutting edge
- B23B 2251/202 .. Three cutting edges
- B23B 2251/204 .. Four cutting edges
- B23B 2251/205 .. Five cutting edges
- B23B 2251/207 .. Six cutting edges
- B23B 2251/208 .. Eight cutting edges
- B23B 2251/24 . Overall form of drilling tools
- B23B 2251/241 .. Cross sections of the diameter of the drill

- B23B 2251/242 . . . increasing in a direction towards the shank from the tool tip
- B23B 2251/244 . . . decreasing in a direction towards the shank from the tool tip
- B23B 2251/245 . . . Variable cross sections
- B23B 2251/247 . . Drilling tools having a working portion at both ends of the shank
- B23B 2251/248 . . Drills in which the outer surface is of special form

- B23B 2251/28 . Arrangement of teeth
- B23B 2251/282 . . Unequal spacing of cutting edges in the circumferential direction
- B23B 2251/285 . . Cutting teeth arranged at different heights
- B23B 2251/287 . . Cutting edges having different lengths

- B23B 2251/40 . Flutes, i.e. chip conveying grooves
- B23B 2251/402 . . with increasing depth in a direction towards the shank from the tool tip
- B23B 2251/404 . . with decreasing depth in a direction towards the shank from the tool tip
- B23B 2251/406 . . of special form not otherwise provided for
- B23B 2251/408 . . Spiral grooves

- B23B 2251/42 . Types of drill
- B23B 2251/422 . . Deep hole drills, e.g. ejector drills
- B23B 2251/424 . . . Gun drills
- B23B 2251/426 . . Micro-drills
- B23B 2251/428 . . Drills for cutting plugs of material

- B23B 2251/44 . Margins, i.e. the area of the circumference following the axial cutting edge in the direction of rotation
- B23B 2251/443 . . Double margin drills
- B23B 2251/446 . . Drills with variable margins

- B23B 2251/46 . Drills having a centre free from cutting edges or with recessed cutting edges

- B23B 2251/48 . Chip breakers

- B23B 2251/50 . Drilling tools comprising cutting inserts
- B23B 2251/505 . . set at different heights

- B23B 2251/52 . Depth indicators

- B23B 2251/54 . Drilling tools having provision for drilling different diameters

- B23B 2251/56 . Guiding pads

- B23B 2251/58 . Guiding rolls

- B23B 2251/60 . Drills with pilots
- B23B 2251/603 . . Detachable pilots, e.g. in the form of a drill
- B23B 2251/606 . . . being a twist drill

- B23B 2251/62 . Drilling tools having means to reinforce the shank, e.g. drills having small shanks being gripped by devices having a larger shank
- B23B 2251/64 . Drills operating in the reverse direction, i.e. in the unscrewing direction of a right-hand thread
- B23B 2251/66 . Drills with provision to be used as a screwdriver
- B23B 2251/68 . Drills with provision for suction ([use of suction in turning, boring or drilling in general B23B 2270/62](#))
- B23B 2251/70 . Drills with vibration suppressing means

B23B 2260/00 Details of constructional elements

- B23B 2260/002 . Accumulators
- B23B 2260/004 . Adjustable elements
- B23B 2260/0045 . . Two elements adjustable relative to each other in three mutually perpendicular directions
- B23B 2260/008 . Bearings
- B23B 2260/0082 . . Sliding contact bearings
- B23B 2260/0085 . . Needle roller bearings
- B23B 2260/0087 . . Preloading of bearings
- B23B 2260/016 . Bolts
- B23B 2260/018 . Brushes
- B23B 2260/02 . Cams
- B23B 2260/022 . Balls
- B23B 2260/024 . Batteries
- B23B 2260/026 . Bushings, e.g. adapter sleeves
- B23B 2260/028 . Chains
- B23B 2260/03 . Clamps
- B23B 2260/032 . Diaphragms
- B23B 2260/034 . Drawbars
- B23B 2260/036 . Cables
- B23B 2260/038 . Cartridges

- B23B 2260/04 . Centre drills of known configuration, e.g. the provision of a centre drill in centres or chucks
- B23B 2260/042 . Collets of known configuration, i.e. devices using a collet
- B23B 2260/044 . Clutches
- B23B 2260/0445 .. Overload clutches
- B23B 2260/048 . Devices to regulate the depth of cut
- B23B 2260/0482 .. Depth controls, e.g. depth stops (stops [B23B 2260/12](#))
- B23B 2260/0485 .. Depth gauges
- B23B 2260/0487 .. Depth indicators (indication scales [L23B 260/88](#))
- B23B 2260/056 . Differential screw threads
- B23B 2260/058 . Dust covers (dust covers in chucks [B23B 2231/28](#), nose pieces in chucks [L231/44](#))
- B23B 2260/062 . Electric motors
- B23B 2260/0625 .. Linear motors
- B23B 2260/066 . Electrostrictive elements
- B23B 2260/068 . Flexible members
- B23B 2260/07 . Gears
- B23B 2260/072 . Grooves
- B23B 2260/0725 .. Spiral
- B23B 2260/076 . Harmonic drive gearboxes, i.e. reduction gearing including wave generator, flex spline and a circular spline
- B23B 2260/078 . Hand tools used to operate chucks or to assemble, adjust or disassemble tools or equipment used for turning, boring or drilling
- B23B 2260/0785 .. for unclamping cutting inserts
- B23B 2260/082 . Holes
- B23B 2260/084 . Hirth couplings
- B23B 2260/088 . Indication scales
- B23B 2260/09 . Knurled surfaces
- B23B 2260/092 . Lasers
- B23B 2260/094 . Levels, e.g. spirit levels
- B23B 2260/096 . Levers

- B23B 2260/098 . Magazines
- B23B 2260/10 . Magnets
- B23B 2260/102 . Magnetostrictive elements
- B23B 2260/104 . Markings, i.e. symbols or other indicating marks
- B23B 2260/106 . Nuts
- B23B 2260/108 . Piezoelectric elements
- B23B 2260/11 . Planetary drives
- B23B 2260/112 . Projections
- B23B 2260/114 . Rings
- B23B 2260/116 . Rollers or rolls
- B23B 2260/118 . Suction pads or vacuum cups, e.g. for attachment of guides to workpieces
- B23B 2260/12 . Stops ([depth controls L23B 260/48C](#))
- B23B 2260/122 . Safety devices
- B23B 2260/124 . Screws
- B23B 2260/126 . Seals
- B23B 2260/128 . Sensors
- B23B 2260/1285 . . . Vibration sensors
- B23B 2260/132 . Serrations ([cutting inserts with serrated bottom surfaces B23B 2200/167](#))
- B23B 2260/134 . Spacers or shims ([shims for supporting cutting inserts B23B 2205/16](#))
- B23B 2260/136 . Springs
- B23B 2260/138 . Screw threads
- B23B 2260/1381 . . . Conical
- B23B 2260/1383 . . . with round thread profile
- B23B 2260/1385 . . . with square thread profile
- B23B 2260/1386 . . . with trapezoidal thread profile
- B23B 2260/1388 . . . with special profile not otherwise provided for
- B23B 2260/142 . Valves
- B23B 2260/144 . Wear indicators

[B23B 2260/146](#) . Wedges

[B23B 2260/158](#) . Worms and worm wheels

[B23B 2265/00](#) Details of general geometric configurations

[B23B 2265/08](#) . Conical

[B23B 2265/12](#) . Eccentric

[B23B 2265/16](#) . Elliptical

[B23B 2265/32](#) . Polygonal

[B23B 2265/322](#) .. Square

[B23B 2265/324](#) .. Pentagonal

[B23B 2265/326](#) .. Hexagonal

[B23B 2265/328](#) .. Octagonal

[B23B 2265/34](#) . Round

[B23B 2265/36](#) . Spherical

[B23B 2270/00](#) Details of turning, boring or drilling machines, processes or tools not otherwise provided for

[B23B 2270/02](#) . Use of a particular power source

[B23B 2270/022](#) .. Electricity

[B23B 2270/025](#) .. Hydraulics

[B23B 2270/027](#) .. Pneumatics

[B23B 2270/04](#) . Use of centrifugal force ([compensating centrifugal force B23B 2250/08](#))

[B23B 2270/06](#) . Use of elastic deformation

[B23B 2270/08](#) . Clamping mechanisms; Provisions for clamping ([B23B 2210/00](#) takes precedence)

[B23B 2270/09](#) . Details relating to unclamping

[B23B 2270/10](#) . Use of ultrasound

[B23B 2270/12](#) . Centering of two components relative to one another

[B23B 2270/14](#) . Constructions comprising exactly two similar components

[B23B 2270/16](#) . Constructions comprising three or more similar components

[B23B 2270/20](#) . Internally located features, machining or gripping of internal surfaces

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