

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

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

(continued)

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 31/101](#), [B23B 31/102](#),) [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)}
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** [{\(surgical drilling machines A61B 17/16\)}](#); **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 B23B 2200/166](#), [with star form bottom surfaces B23C 2200/167](#))
 - ... with cutting geometries differing according to the indexed position
- B23B 2200/3645 .. Lands, i.e. the outer peripheral section of the rake face
 - ... being variable ([negative lands of variable width B23B 2200/3672](#))
 - ... having negative cutting angles ([with bevelled cutting edge B23C 2200/243](#))
 - 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 B23B 2260/058](#))
- 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 B23B 2260/058](#))
- 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 B23B 2260/088)
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 B23B 2260/0482)
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)