

**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:

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

[B23B 47/24](#) covered by [B23Q 16/00](#)

**Guidance heading: 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}

**Guidance heading:** 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}
<b>B23B 25/00</b>	<b>Accessories or auxiliary equipment for turning-machines</b> (for machine tools in general <a href="#">B23Q</a> ; cooling or lubricating <a href="#">B23Q 11/12</a> )
B23B 25/02	. Arrangements for chip-breaking in turning-machines (on cutting tools <a href="#">B23B 27/22</a> )
B23B 25/04	. Safety guards specially designed for turning machines ({ <a href="#">B23Q 11/08</a> takes precedence;} in general <a href="#">F16P</a> )
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 <a href="#">G01B</a> )
B23B 25/065	.. {Tool setting height gauges}
<b>B23B 27/00</b>	<b>Tools for turning or boring machines</b> (for drilling machines <a href="#">B23B 51/00</a> ); <b>Tools of a similar kind in general; Accessories therefor</b>
<b>NOTE</b>	
all subgroups except <a href="#">B23B 27/12</a> 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 ( <a href="#">B23B 27/141</a> and <a href="#">B23B 27/22</a> take precedence)}
B23B 27/007	. {for internal turning (boring bars <a href="#">B23B 29/02</a> , boring heads <a href="#">B23B 29/03</a> ; milling cutters <a href="#">B23C 5/00</a> ; reamers <a href="#">B23D 77/00</a> )}
B23B 27/02	. Cutting tools with straight main part and cutting edge at an angle ( <a href="#">B23B 27/04</a> to <a href="#">B23B 27/08</a> take precedence)
B23B 27/04	. Cutting-off tools ( <a href="#">B23B 27/08</a> takes precedence; {toolholders for cutting-off inserts <a href="#">B23B 29/043</a> })
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 <a href="#">B23B 27/083</a> )}
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 <a href="#">B23B 51/06</a> ; features relating to lubricating or cooling of milling cutters <a href="#">B23C 5/28</a> ; arrangements or devices for cooling or lubricating tools or work <a href="#">B23Q 11/10</a> )}
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, <a href="#">B23B 27/1603</a> ; with removable plate-like milling cutting inserts of special shape <a href="#">B23C 5/202</a> )}
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 ( <a href="#">B23B 27/1614</a> to <a href="#">B23B 27/1655</a> 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 ( <a href="#">B23B 27/1644</a> 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 ( <a href="#">B23B 27/1644</a> 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 ( <a href="#">B23B 27/1662</a> to <a href="#">B23B 27/1681</a> 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 ( <a href="#">B23B 27/1677</a> takes precedence)}
B23B 27/1666	...	{with plate-like cutting inserts clamped by a clamping member acting almost perpendicularly on chip-forming plane ( <a href="#">B23B 27/1677</a> 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 ( <a href="#">B23B 27/1655</a> and <a href="#">B23B 27/1681</a> 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
<b>B23B 29/00</b>	<b>Holders for non-rotary cutting tools (B23B 27/12 takes precedence); Boring bars or boring heads; Accessories for tool holders</b>
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 <a href="#">B23B 29/03435</a> to <a href="#">B23B 29/03478</a> }
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 ( <a href="#">B23B 29/14</a> 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 <a href="#">B23B 27/086</a> )}
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 <a href="#">B23Q 16/00</a> )}
B23B 29/242	..	{Turrets, without description of the angular positioning device (turret lathes for turning individually-chucked workpieces <a href="#">B23B 3/16</a> ; turrets with manually operated angular positioning devices <a href="#">B23B 29/282</a> ; turrets with power operated angular positioning devices <a href="#">B23B 29/323</a> )}
B23B 29/244	..	{Toolposts, i.e. clamping quick-change toolholders, without description of the angular positioning device (toolposts with manually operated angular positioning devices <a href="#">B23B 29/285</a> ; toolposts with power operated angular positioning devices <a href="#">B23B 29/326</a> )}
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 <a href="#">B23Q 16/00</a> )}
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 <a href="#">B23Q 16/00</a> )}
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



<b>B23B 31/00</b>	<b>Chucks</b> {(allowing axial oscillation of percussion tool bits <a href="#">B25D 17/08</a> ); <b>Expansion mandrels; Adaptations thereof for remote control</b> (faceplates <a href="#">B23Q 1/50</a> ; devices for securing work or tools to spindles in general <a href="#">B23Q 3/12</a> ; rotary devices holding by magnetic and/or electrical force acting directly on work <a href="#">B23Q 3/152</a> )}
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 <a href="#">B23B 29/034</a> ; holding tools yieldably <a href="#">B23B 31/08</a> ; with means for adjusting the chuck with respect to the working spindle <a href="#">B23B 31/36</a> )}
B23B 31/028	.. {the axial positioning of the tool being adjustable ( <a href="#">B23B 31/208</a> takes precedence; with means for adjusting the chuck with respect to the working spindle <a href="#">B23B 31/36</a> )}
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 ( <a href="#">B23B 31/1602</a> , <a href="#">B23B 31/16062</a> , <a href="#">B23B 31/161</a> , <a href="#">B23B 31/16137</a> , <a href="#">B23B 31/16175</a> , <a href="#">B23B 31/16212</a> , <a href="#">B23B 31/1625</a> and <a href="#">B23B 31/16283</a> take precedence; Chucks with simultaneously-acting jaws moving radially <a href="#">B23B 31/16</a> )}
B23B 31/102	... {Jaws, accessories or adjustment means ( <a href="#">B23B 31/16008</a> , <a href="#">B23B 31/1605</a> , <a href="#">B23B 31/16087</a> , <a href="#">B23B 31/16125</a> , <a href="#">B23B 31/16162</a> , <a href="#">B23B 31/162</a> , <a href="#">B23B 31/16237</a> , <a href="#">B23B 31/1627</a> 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 <a href="#">B23B 31/22</a> )}
B23B 31/1072	.... {Retention by cylindrical elements (cylindrical elements acting as jaws <a href="#">B23B 31/22</a> )}

B23B 31/1073	....	{Retention by conical elements (conical elements acting as jaws <a href="#">B23B 31/22</a> )}
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 <a href="#">B23B 31/117</a> }
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 <a href="#">B23B 31/16041</a> )}
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 ( <a href="#">B23B 31/16029</a> 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 <a href="#">B23B 31/123</a> )}
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 ( <a href="#">B23B 31/1607</a> 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 ( <a href="#">B23B 31/16108</a> 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 ( <a href="#">B23B 31/16145</a> 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 ( <a href="#">B23B 31/16183 takes precedence</a> )}
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 ( <a href="#">B23B 31/1622 takes precedence</a> )}
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 ( <a href="#">B23B 31/16258 takes precedence</a> )}
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 {( <a href="#">B23B 31/185 takes precedence</a> )}

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 ( <a href="#">B23B 31/205</a> takes precedence)}
B23B 31/208	.....	{ with a tool positioning stop (axial positioning of the tool being adjustable <a href="#">B23B 31/028</a> )}
B23B 31/22	....	Jaws in the form of balls {(retention by balls <a href="#">B23B 31/1071</a> )}
B23B 31/223	.....	{Jaws in the form of cylindrical elements (Retention by cylindrical elements <a href="#">B23B 31/1072</a> )}
B23B 31/226	.....	{Jaws in the form of conical elements (Retention by conical elements <a href="#">B23B 31/1073</a> )}
B23B 31/24	..	characterised by features relating primarily to remote control of the gripping means {( <a href="#">B23B 31/201</a> takes precedence)}
B23B 31/26	...	using mechanical transmission through the working-spindle {( <a href="#">B23B 31/16</a> and <a href="#">B23B 31/40</a> 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 {( <a href="#">B23B 31/10</a> and <a href="#">B23B 31/40</a> 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 {( <a href="#">B23B 31/086</a> 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 <a href="#">B23B 31/20</a> )}
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 ( <a href="#">B23B 31/4026</a> 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}

**Guidance heading:** **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

**Guidance heading:** 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 . Liftable 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
<b>B23B 51/00</b>	<b>Tools for drilling machines</b> {(for drilling wood <a href="#">B27G 15/00</a> ; for drilling stone or stone-like materials, e.g. brick, concrete, glass <a href="#">B28D 1/00</a> ; drill bits for earth or rock drilling <a href="#">E21B 10/00</a> )}
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 <a href="#">B28D 1/041</a> )}
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 ( <a href="#">B23B 51/0493</a> takes precedence)}
B23B 51/0486	.. {with lubricating or cooling equipment ( <a href="#">B23B 51/042</a> 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 {( <a href="#">B23B 51/042</a> and <a href="#">B23B 51/0486</a> take precedence)}
B23B 51/08	. Drills combined with tool parts or tools for performing additional working {( <a href="#">B23G 5/20</a> takes precedence)}
B23B 51/10	. Bits for countersinking
B23B 51/101	.. {Deburring tools ( <a href="#">B23B 51/103</a> 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

<b>B23B 2200/00</b>	<b>Details of cutting inserts</b>
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 ( <a href="#">chip breaking projections in general B23B 2200/321</a> )
B23B 2200/082	.. with elevated clamping surface
B23B 2200/083	.. curved
B23B 2200/085	.. discontinuous
B23B 2200/086	.. with one or more grooves

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

- 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 2200/3636 . . . . 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 2200/3672 . . . . 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
  - .. orientated obliquely to the hole in the insert or to the seating surface
- 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
  - .. One or more walls of the seat being elastically deformable
- 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
  - .. using a magazine
- B23B 2205/215 . . using a magazine

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

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

<a href="#">B23B 2215/16</a>	. Camshafts
<a href="#">B23B 2215/20</a>	. Crankshafts
<a href="#">B23B 2215/24</a>	. Components of internal combustion engines ( <a href="#">B23B 2215/16</a> and <a href="#">B23B 2215/20</a> take precedence)
<a href="#">B23B 2215/242</a>	.. Cylinder liners
<a href="#">B23B 2215/245</a>	.. Pistons
<a href="#">B23B 2215/247</a>	.. Piston rings
<a href="#">B23B 2215/28</a>	. Firearms, guns
<a href="#">B23B 2215/32</a>	. Railway tracks
<a href="#">B23B 2215/36</a>	. Railway wheels
<a href="#">B23B 2215/40</a>	. Spectacles
<a href="#">B23B 2215/56</a>	. Springs
<a href="#">B23B 2215/60</a>	. Steel wool
<a href="#">B23B 2215/64</a>	. Thin walled components
<a href="#">B23B 2215/68</a>	. Threaded components
<a href="#">B23B 2215/72</a>	. Tubes, pipes
<a href="#">B23B 2215/76</a>	. Components for turbines
<a href="#">B23B 2215/81</a>	.. Turbine blades

**[B23B 2220/00](#)****Details of turning, boring or drilling processes**

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

**[B23B 2222/00](#)****Materials of tools or workpieces composed of metals, alloys or metal matrices**

<a href="#">B23B 2222/04</a>	. Aluminium
<a href="#">B23B 2222/12</a>	. Brass
<a href="#">B23B 2222/14</a>	. Cast iron ( <a href="#">iron B23B 2222/44</a> )
<a href="#">B23B 2222/16</a>	. Cermet
<a href="#">B23B 2222/21</a>	. Copper
<a href="#">B23B 2222/24</a>	. Gold

<a href="#">B23B 2222/28</a>	. Details of hard metal, i.e. cemented carbide
<a href="#">B23B 2222/32</a>	. Details of high speed steel ( <a href="#">stainless steel B23B 2222/80</a> , <a href="#">steel B23B 2222/84</a> )
<a href="#">B23B 2222/36</a>	. Nickel chrome alloys, e.g. Inconel®
<a href="#">B23B 2222/41</a>	. Nickel steel alloys, e.g. invar®
<a href="#">B23B 2222/44</a>	. Iron ( <a href="#">cast iron B23B 2222/14</a> )
<a href="#">B23B 2222/48</a>	. Lead
<a href="#">B23B 2222/52</a>	. Magnesium
<a href="#">B23B 2222/56</a>	. Non-specified metals
<a href="#">B23B 2222/61</a>	. Metal matrices with non-metallic particles or fibres
<a href="#">B23B 2222/64</a>	. Nickel
<a href="#">B23B 2222/68</a>	. Palladium
<a href="#">B23B 2222/72</a>	. Platinum
<a href="#">B23B 2222/76</a>	. Silver
<a href="#">B23B 2222/80</a>	. Stainless steel ( <a href="#">high speed steel B23B 2222/32</a> , <a href="#">steel B23B 2222/84</a> )
<a href="#">B23B 2222/84</a>	. Steel ( <a href="#">high speed steel B23B 2222/32</a> , <a href="#">stainless steel B23B 2222/80</a> )
<a href="#">B23B 2222/88</a>	. Titanium
<a href="#">B23B 2222/92</a>	. Tungsten
<a href="#">B23B 2222/98</a>	. Zinc

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

<a href="#">B23B 2224/04</a>	. Aluminium oxide
<a href="#">B23B 2224/08</a>	. Aluminium nitride
<a href="#">B23B 2224/12</a>	. Chromium carbide
<a href="#">B23B 2224/16</a>	. Molybdenum disulphide
<a href="#">B23B 2224/20</a>	. Tantalum carbide
<a href="#">B23B 2224/24</a>	. Titanium aluminium nitride
<a href="#">B23B 2224/28</a>	. Titanium carbide
<a href="#">B23B 2224/32</a>	. Titanium carbide nitride (TiCN)
<a href="#">B23B 2224/36</a>	. Titanium nitride
<a href="#">B23B 2224/40</a>	. Tungsten disulphide

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

<a href="#">B23B 2226/04</a>	. Aromatic polyamides
<a href="#">B23B 2226/09</a>	. Asbestos
<a href="#">B23B 2226/12</a>	. Boron nitride
<a href="#">B23B 2226/125</a>	. . cubic (CBN)
<a href="#">B23B 2226/15</a>	. Cardboard
<a href="#">B23B 2226/18</a>	. Ceramic
<a href="#">B23B 2226/27</a>	. Composites
<a href="#">B23B 2226/275</a>	. . Carbon fibre reinforced carbon composites
<a href="#">B23B 2226/31</a>	. 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 ( <a href="#">turning glass B28D 1/16</a> , <a href="#">drilling glass B28D 1/14</a> )
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 ( <a href="#">working of stone B28D</a> )
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
<b>B23B 2231/00</b>	<b>Details of chucks, toolholder shanks or tool shanks</b>
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 ( <a href="#">break points on tools not in shank area B23B 2210/12</a> , <a href="#">shanks with reduced cross sections in general B23B 2231/0252</a> )
B23B 2231/0216	.. Overall cross sectional shape of the shank ( <a href="#">not used</a> )
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 ( <a href="#">to provide a preferred breaking point B23B 2231/0212</a> )
B23B 2231/0256	.. Flats
B23B 2231/026	.. Grooves ( <a href="#">keyways B23B 2231/0276</a> )
B23B 2231/0264	... Axial grooves
B23B 2231/0268	... Radial grooves
B23B 2231/0272	... Grooves on conical clamping surfaces
B23B 2231/0276	.. Keyways ( <a href="#">axial grooves B23B 2231/0264</a> )
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 <a href="#">L231/20H3</a> )
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 ( <a href="#">in general B23Q 17/006</a> )

- 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
  - .. Helix angles
  - ... Variable
- B23B 2251/043 . Side or plan views of cutting edges
  - .. Curved cutting edges
  - .. Discontinuous or interrupted cutting edges
  - .. Cutting edges with a wave form
- B23B 2251/046 . Cross sectional views of the cutting edges
  - .. Bevelled cutting edges
  - .. Rounded cutting edges
  - .. Sharp cutting edges
- B23B 2251/08 . Configuration of the cutting part, i.e. the main cutting edges
- B23B 2251/082 .
- B23B 2251/085 .
- B23B 2251/087 .
- B23B 2251/12 .
- B23B 2251/122 .
- B23B 2251/125 .
- B23B 2251/127 .
- B23B 2251/14 .

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

<a href="#">B23B 2251/58</a>	. Guiding rolls
<a href="#">B23B 2251/60</a>	. Drills with pilots
<a href="#">B23B 2251/603</a>	. . Detachable pilots, e.g. in the form of a drill
<a href="#">B23B 2251/606</a>	. . . being a twist drill
<a href="#">B23B 2251/62</a>	. Drilling tools having means to reinforce the shank, e.g. drills having small shanks being gripped by devices having a larger shank
<a href="#">B23B 2251/64</a>	. Drills operating in the reverse direction, i.e. in the unscrewing direction of a right-hand thread
<a href="#">B23B 2251/66</a>	. Drills with provision to be used as a screwdriver
<a href="#">B23B 2251/68</a>	. Drills with provision for suction ( <a href="#">use of suction in turning, boring or drilling in general B23B 2270/62</a> )
<a href="#">B23B 2251/70</a>	. Drills with vibration suppressing means
<b>B23B 2260/00</b>	<b>Details of constructional elements</b>
<a href="#">B23B 2260/002</a>	. Accumulators
<a href="#">B23B 2260/004</a>	. Adjustable elements
<a href="#">B23B 2260/0045</a>	. . Two elements adjustable relative to each other in three mutually perpendicular directions
<a href="#">B23B 2260/008</a>	. Bearings
<a href="#">B23B 2260/0082</a>	. . Sliding contact bearings
<a href="#">B23B 2260/0085</a>	. . Needle roller bearings
<a href="#">B23B 2260/0087</a>	. . Preloading of bearings
<a href="#">B23B 2260/016</a>	. Bolts
<a href="#">B23B 2260/018</a>	. Brushes
<a href="#">B23B 2260/02</a>	. Cams
<a href="#">B23B 2260/022</a>	. Balls
<a href="#">B23B 2260/024</a>	. Batteries
<a href="#">B23B 2260/026</a>	. Bushings, e.g. adapter sleeves
<a href="#">B23B 2260/028</a>	. Chains
<a href="#">B23B 2260/03</a>	. Clamps
<a href="#">B23B 2260/032</a>	. Diaphragms
<a href="#">B23B 2260/034</a>	. Drawbars
<a href="#">B23B 2260/036</a>	. Cables
<a href="#">B23B 2260/038</a>	. Cartridges
<a href="#">B23B 2260/04</a>	. Centre drills of known configuration, e.g. the provision of a centre drill in centres or chucks
<a href="#">B23B 2260/042</a>	. Collets of known configuration, i.e. devices using a collet
<a href="#">B23B 2260/044</a>	. Clutches
<a href="#">B23B 2260/0445</a>	. . Overload clutches
<a href="#">B23B 2260/048</a>	. Devices to regulate the depth of cut
<a href="#">B23B 2260/0482</a>	. . Depth controls, e.g. depth stops ( <a href="#">stops B23B 2260/12</a> )
<a href="#">B23B 2260/0485</a>	. . Depth gauges



<a href="#">B23B 2260/0487</a>	. . Depth indicators ( <a href="#">indication scales B23B 2260/088</a> )
<a href="#">B23B 2260/056</a>	. Differential screw threads
<a href="#">B23B 2260/058</a>	. Dust covers ( <a href="#">dust covers in chucks B23B 2231/28</a> , <a href="#">nose pieces in chucks L231/44</a> )
<a href="#">B23B 2260/062</a>	. Electric motors
<a href="#">B23B 2260/0625</a>	. . Linear motors
<a href="#">B23B 2260/066</a>	. Electrostrictive elements
<a href="#">B23B 2260/068</a>	. Flexible members
<a href="#">B23B 2260/07</a>	. Gears
<a href="#">B23B 2260/072</a>	. Grooves
<a href="#">B23B 2260/0725</a>	. . Spiral
<a href="#">B23B 2260/076</a>	. Harmonic drive gearboxes, i.e. reduction gearing including wave generator, flex spline and a circular spline
<a href="#">B23B 2260/078</a>	. Hand tools used to operate chucks or to assemble, adjust or disassemble tools or equipment used for turning, boring or drilling
<a href="#">B23B 2260/0785</a>	. . for unclamping cutting inserts
<a href="#">B23B 2260/082</a>	. Holes
<a href="#">B23B 2260/084</a>	. Hirth couplings
<a href="#">B23B 2260/088</a>	. Indication scales
<a href="#">B23B 2260/09</a>	. Knurled surfaces
<a href="#">B23B 2260/092</a>	. Lasers
<a href="#">B23B 2260/094</a>	. Levels, e.g. spirit levels
<a href="#">B23B 2260/096</a>	. Levers
<a href="#">B23B 2260/098</a>	. Magazines
<a href="#">B23B 2260/10</a>	. Magnets
<a href="#">B23B 2260/102</a>	. Magnetostrictive elements
<a href="#">B23B 2260/104</a>	. Markings, i.e. symbols or other indicating marks
<a href="#">B23B 2260/106</a>	. Nuts
<a href="#">B23B 2260/108</a>	. Piezoelectric elements
<a href="#">B23B 2260/11</a>	. Planetary drives
<a href="#">B23B 2260/112</a>	. Projections
<a href="#">B23B 2260/114</a>	. Rings
<a href="#">B23B 2260/116</a>	. Rollers or rolls
<a href="#">B23B 2260/118</a>	. Suction pads or vacuum cups, e.g. for attachment of guides to workpieces
<a href="#">B23B 2260/12</a>	. Stops ( <a href="#">depth controls B23B 2260/0482</a> )
<a href="#">B23B 2260/122</a>	. Safety devices
<a href="#">B23B 2260/124</a>	. Screws
<a href="#">B23B 2260/126</a>	. Seals
<a href="#">B23B 2260/128</a>	. Sensors
<a href="#">B23B 2260/1285</a>	. . Vibration sensors
<a href="#">B23B 2260/132</a>	. Serrations ( <a href="#">cutting inserts with serrated bottom surfaces B23B 2200/167</a> )

- 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](#))