

**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 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](#)

**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 }

**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 }

		( <a href="#">B23B 27/1677</a> takes precedence) }
<a href="#">B23B 27/1666</a>	...	{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) }
<a href="#">B23B 27/167</a>	....	{in which the clamping member breaks the chips }
<a href="#">B23B 27/1674</a>	....	{in which the chip-breaking clamping member is adjustable }
<a href="#">B23B 27/1677</a>	...	{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 }
<a href="#">B23B 27/1681</a>	...	{Adjustable position of the plate-like cutting inserts }
<a href="#">B23B 27/1685</a>	...	{Adjustable position of the cutting inserts ( <a href="#">B23B 27/1655</a> and <a href="#">B23B 27/1681</a> take precedence) }
<a href="#">B23B 27/1688</a>	....	{Height of the cutting tip adjustable }
<a href="#">B23B 27/1692</a>	....	{Angular position of the cutting insert adjustable around an axis parallel to the chip-forming plane }
<a href="#">B23B 27/1696</a>	....	{Angular position of the cutting insert adjustable around an axis generally perpendicularly to the chip-forming plane }
<a href="#">B23B 27/18</a>	..	with cutting bits or tips {or cutting inserts } rigidly mounted, e.g. by brazing
<a href="#">B23B 27/20</a>	...	with diamond bits {or cutting inserts }
<a href="#">B23B 27/22</a>	.	Cutting tools with chip-breaking equipment { ( <a href="#">B23B 27/045</a> , <a href="#">B23B 27/143</a> , <a href="#">B23B 27/16</a> take precedence; arrangements for chip-breaking <a href="#">B23B 25/02</a> ; for milling tools <a href="#">B23C 5/165</a> ) }
<a href="#">B23B 27/24</a>	.	Knurling tools
<b><a href="#">B23B 29/00</a></b>		<b>Holders for non-rotary cutting tools (<a href="#">B23B 27/12</a> takes precedence) ; Boring bars or boring heads; Accessories for tool holders</b>
<a href="#">B23B 29/02</a>	.	Boring bars
<a href="#">B23B 29/022</a>	..	{with vibration reducing means }
<a href="#">B23B 29/025</a>	..	{Boring toolholders fixed on the boring bar }
<a href="#">B23B 29/027</a>	..	{Steadies for boring bars (auxiliary devices, e.g. steadies, rests <a href="#">B23Q 1/76</a> ) }
<a href="#">B23B 29/03</a>	.	Boring heads
<a href="#">B23B 29/034</a>	..	with tools moving radially, e.g. for making chamfers or undercuttings
<a href="#">B23B 29/03403</a>	...	{radially adjustable before starting manufacturing }
<a href="#">B23B 29/03407</a>	....	{ by means of screws and nuts }
<a href="#">B23B 29/0341</a>	.....	{ Cartridges }
<a href="#">B23B 29/03414</a>	.....	{ adjustment of the tool placed in the hole being possible }
<a href="#">B23B 29/03417</a>	....	{ by means of inclined planes }
<a href="#">B23B 29/03421</a>	....	{ by pivoting the tool carriers or by elastic deformation }
<a href="#">B23B 29/03425</a>	....	{ by means of gears and racks }
<a href="#">B23B 29/03428</a>	....	{ by means of an eccentric }
<a href="#">B23B 29/03432</a>	...	{radially adjustable during manufacturing }
<a href="#">B23B 29/03435</a>	....	{ by means of screws and nuts }
<a href="#">B23B 29/03439</a>	.....	{ 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 { ( <a href="#">cutting tools with yieldable support for the cutting insert <a href="#">B23B 27/086</a></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 { ( <a href="#">indexing devices <a href="#">B23Q 16/00</a></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 [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
<b>NOTE</b>		
Group <a href="#">B23B 31/12</a> takes precedence over groups { <a href="#">B23B 31/10B</a> , <a href="#">B23B 31/10C</a> , } <a href="#">B23B 31/103</a> to <a href="#">B23B 31/117</a>		
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</a> 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 ( <a href="#">B23B 31/1622</a> 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 ( <a href="#">B23B 31/16258</a> 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 { ( <a href="#">B23B 31/185</a> 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 ( <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 { ( <a href="#">retention by balls B23B 31/1071</a> ) }
B23B 31/223	.....	{Jaws in the form of cylindrical elements ( <a href="#">Retention by cylindrical elements B23B 31/1072</a> ) }
B23B 31/226	.....	{Jaws in the form of conical elements ( <a href="#">Retention by conical elements 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 [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 }

**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 . 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

### Guidance heading:

### **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 ( <a href="#">with projections on rake surface B23B 2200/081</a> )
B23B 2200/323	..	by chip breaking depressions ( <a href="#">with one or more grooves on top surface for chip breaking B23B 2200/087</a> , <a href="#">with multiple chip breaking grooves B23B 2200/325</a> )
B23B 2200/325	..	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> )
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 <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 L23C 200/16F](#), [with star form bottom surfaces B23C 2200/167](#))
- B23B 2200/3636 . . . with cutting geometries differing according to the indexed position
- B23B 2200/3645 . . Lands, i.e. the outer peripheral section of the rake face
- B23B 2200/3654 . . . being variable ([negative lands of variable width B23B 2200/3672](#))
- B23B 2200/3663 . . . having negative cutting angles ([with bevelled cutting edge B23C 2200/243](#))
- B23B 2200/3672 . . . . being variable ([lands with variable width B23B 2200/3654](#))
- B23B 2200/3681 . . Split inserts, i.e. comprising two or more sections roughly equal in size and having similar or dissimilar cutting geometries
- B23B 2200/369 . . Mounted tangentially, i.e. where the rake face is not the face with the largest area

#### Guidance heading:

### **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



<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
<b>B23B 2222/00</b>	<b>Materials of tools or workpieces composed of metals, alloys or metal matrices</b>
<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

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 ( <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
<b>B23B 2228/00</b>	<b>Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner</b>
B23B 2228/04	. applied by chemical vapour deposition (CVD)
B23B 2228/08	. applied by physical vapour deposition (PVD)
B23B 2228/10	. Coatings
B23B 2228/105	. . with specified thickness
B23B 2228/12	. Abrasive
B23B 2228/16	. Shape memory alloys
B23B 2228/21	. Cast, i.e. In the form of a casting

- B23B 2228/24 . Hard, i.e. after being hardened
- B23B 2228/28 . Soft
- B23B 2228/32 . Explosive
- B23B 2228/36 . Multi-layered
- B23B 2228/41 . Highly conductive
- B23B 2228/44 . Materials having grain size less than 1 micrometre, e.g. nano-crystalline
- B23B 2228/48 . Self-luminous, i.e. light-emitting, e.g. fluorescent
- B23B 2228/52 . Solid lubricants
- B23B 2228/56 . Two phase materials
- B23B 2228/61 . Materials comprising whiskers

#### **B23B 2229/00 Details of boring bars or boring heads**

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

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

- B23B 2231/02 . Features of shanks of tools not relating to the operation performed by the tool
- B23B 2231/0204 .. Connection of shanks to working elements of tools
- B23B 2231/0208 .. Bores
- B23B 2231/0212 .. Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred ([break points on tools not in shank area B23B 2210/12](#), [shanks with reduced cross sections in general B23B 2231/0252](#))
- B23B 2231/0216 .. Overall cross sectional shape of the shank (*not used*)
- B23B 2231/022 ... Triangular
- B23B 2231/0224 .... Rounded triangular
- B23B 2231/0228 ... Square
- B23B 2231/0232 ... Hexagonal
- B23B 2231/0236 ... Octagonal
- B23B 2231/024 ... Star form
- B23B 2231/0244 ... Special forms not otherwise provided for
- B23B 2231/0248 .. Codes for diameters

- B23B 2231/0252    ..    Shanks having a section of reduced diameter ([to provide a preferred breaking point B23B 2231/0212](#))
- B23B 2231/0256    ..    Flats
- B23B 2231/026    ..    Grooves ([keyways B23B 2231/0276](#))
- B23B 2231/0264    ...    Axial grooves
- B23B 2231/0268    ...    Radial grooves
- B23B 2231/0272    ...    Grooves on conical clamping surfaces
- B23B 2231/0276    ..    Keyways ([axial grooves B23B 2231/0264](#))
- B23B 2231/028    ..    Lugs
- B23B 2231/0284    ..    Notches
- B23B 2231/0288    ..    Conical shanks of tools in which the cone is not formed as one continuous surface
- B23B 2231/0292    ..    Flanges of conical shanks
- B23B 2231/0296    ..    Ends of conical shanks, e.g. pull studs, tangs
  
- B23B 2231/04    .    Adapters
  
- B23B 2231/06    .    Chucks for handtools having means for opening and closing the jaws using the driving motor of the handtool
  
- B23B 2231/08    .    Chucks for shanks of tools having means for reducing the bending of the retained shanks
  
- B23B 2231/10    .    Chucks having data storage chips
  
- B23B 2231/12    .    Chucks having means to amplify the force produced by the actuating means to increase the clamping force
  
- B23B 2231/14    .    Chucks with clamping force limitation means
  
- B23B 2231/20    .    Collet chucks
- B23B 2231/2002    ..    Collets having blade-like jaws
- B23B 2231/2005    ..    Keys preventing rotation
- B23B 2231/2008    ..    Bores holding the collet having a slightly conical profile
- B23B 2231/201    ..    Operating surfaces of collets, i.e. the surface of the collet acted on by the operating means
- B23B 2231/2013    ...    Non-cylindrical ([polygonal L231/20H3](#))
- B23B 2231/2016    ...    Polygonal
- B23B 2231/2018    ...    with a saw-tooth profile
- B23B 2231/2021    ...    comprising two different cones
- B23B 2231/2024    ..    Non-circular surfaces of collets for the transmission of torque
- B23B 2231/2027    ..    Gripping surfaces, i.e. the surface contacting the tool or workpiece
- B23B 2231/2029    ...    Conical
- B23B 2231/2032    ...    with non-cylindrical cross section
- B23B 2231/2035    ...    Polygonal
- B23B 2231/2037    ...    Roughened
- B23B 2231/204    ...    with saw tooth profiles

- B23B 2231/2043 . . . Discontinuous, interrupted or split
- B23B 2231/2045 . . . comprising two or more diameters, e.g. stepped
- B23B 2231/2048 . . Collets comprising inserts
- B23B 2231/2051 . . . brazed in position
- B23B 2231/2054 . . . glued in position
- B23B 2231/2056 . . . where the insert forms part of the surface gripping the workpiece or tool
- B23B 2231/2059 . . . Hard inserts
- B23B 2231/2062 . . . Inserts mechanically clamped in the collet
- B23B 2231/2064 . . . Inserts in the form of a roll
- B23B 2231/2067 . . . Soft inserts
- B23B 2231/207 . . . Inserts welded in position
- B23B 2231/2072 . . Jaws of collets
- B23B 2231/2075 . . . of special form
- B23B 2231/2078 . . Jaw carriers, i.e. components retaining the collet itself
- B23B 2231/2081 . . Keys, spanners or wrenches to operate the collet chuck
- B23B 2231/2083 . . Collets comprising screw threads
- B23B 2231/2086 . . Collets in which the jaws are formed as separate elements, i.e. not joined together
- B23B 2231/2089 . . Slits of collets
- B23B 2231/2091 . . . extending from both axial ends of the collet
- B23B 2231/2094 . . . Helical
- B23B 2231/2097 . . . having a special form not otherwise provided for
  
- B23B 2231/22 . . Compensating chucks, i.e. with means for the compensation of irregularities of form or position
  
- B23B 2231/24 . . Cooling or lubrication means
  
- B23B 2231/26 . . Detection of clamping ([in general B23Q 17/006](#))
  
- B23B 2231/28 . . Dust covers ([nose pieces in chucks B23B 2231/44](#), [dust covers for turning, boring or drilling in general L23B 260/58](#))
  
- B23B 2231/30 . . Chucks with four jaws
  
- B23B 2231/32 . . Guideways for jaws
  
- B23B 2231/34 . . Jaws
- B23B 2231/345 . . Different jaws
  
- B23B 2231/36 . . Sealed joints
- B23B 2231/365 . . using O-rings
  
- B23B 2231/38 . . Keyless chucks for hand tools
  
- B23B 2231/40 . . Chucks having a pivotal retention element in the form of a laterally acting cam
  
- B23B 2231/42 . . Chucks operated by a motor which is movable to engage with, or disengage from, the chuck operating means

- B23B 2231/44 . Nose pieces ([dust covers in chucks B23B 2231/28](#), [dust covers for turning, boring or drilling in general L23B 260/58](#))
- B23B 2231/46 . Pins
- B23B 2231/48 . Polygonal cross sections
- B23B 2231/50 . Devices to counteract clamping forces exerted within the spindle in order to release the tool or workpiece
- B23B 2231/52 . Chucks with means to loosely retain the tool or workpiece in the unclamped position
- B23B 2231/54 . Chucks for taps

#### **B23B 2233/00 Details of centres or drivers**

- B23B 2233/04 . Means to allow the facing of the axial end of the workpiece near the axis of rotation
- B23B 2233/08 . Centres or drivers comprising a ball
- B23B 2233/12 . Centres or drivers with a special arrangement of bearings or with special bearings
- B23B 2233/16 . Centres or drivers comprising chucks
- B23B 2233/20 . Centres or drivers with convex surfaces
- B23B 2233/24 . Centres or drivers with inserts
- B23B 2233/28 . Centres or drivers supporting the workpiece at three points around the circumference
- B23B 2233/32 . Yieldable centres

#### **B23B 2235/00 Turning of brake discs, drums or hubs**

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

#### **B23B 2240/00 Details of connections of tools or workpieces**

- B23B 2240/04 . Bayonet connections
- B23B 2240/08 . Brazed connections
- B23B 2240/11 . Soldered connections



- B23B 2240/16 . Welded connections
- B23B 2240/21 . Glued connections
- B23B 2240/24 . Connections using hollow screws, e.g. for the transmission of coolant
- B23B 2240/28 . Shrink-fitted connections, i.e. using heating and cooling to produce interference fits  
([shrink fits chucks B23B 31/1179](#))
- B23B 2240/32 . Press fits
- B23B 2240/36 . Connections using a tongue and a hollow of corresponding prismatic form
  
- B23B 2247/00      Details of drilling jigs**
- B23B 2247/02 . Jigs for drilling spectacles ([machines for drilling spectacle lenses B28D 1/143](#))
- B23B 2247/04 . Jigs using one or more holes as datums for drilling further holes
- B23B 2247/06 . Jigs for drilling holes for lock sets for doors
- B23B 2247/08 . Jigs for drilling overlapping or interfering holes
- B23B 2247/10 . Jigs for drilling inclined holes
- B23B 2247/12 . Drilling jigs with means to affix the jig to the workpiece
- B23B 2247/14 . Jigs for drilling flanges
- B23B 2247/16 . Jigs for drilling stairs and associated components, e.g. banisters or handrails
- B23B 2247/18 . Jigs comprising V-blocks
- B23B 2247/20 . Jigs for drilling holes for lock wires in bolts or nuts
  
- B23B 2250/00      Compensating adverse effects during turning, boring or drilling**
- B23B 2250/04 . Balancing rotating components ([vibration damping B23B 2250/16](#))
- B23B 2250/08 . Compensation of centrifugal force ([use of centrifugal force B23B 2270/04](#))
- B23B 2250/12 . Cooling and lubrication
- B23B 2250/125 . . Improving heat transfer away from the working area of the tool by conduction
- B23B 2250/16 . Damping of vibrations ([balancing rotating components B23B 2250/04](#))
  
- B23B 2251/00      Details of tools for drilling machines**
- B23B 2251/02 . Connections between shanks and removable cutting heads

- B23B 2251/04 . Angles, e.g. cutting angles
- B23B 2251/043 . . Helix angles
- B23B 2251/046 . . . Variable
  
- B23B 2251/08 . Side or plan views of cutting edges
- B23B 2251/082 . . Curved cutting edges
- B23B 2251/085 . . Discontinuous or interrupted cutting edges
- B23B 2251/087 . . Cutting edges with a wave form
  
- B23B 2251/12 . Cross sectional views of the cutting edges
- B23B 2251/122 . . Bevelled cutting edges
- B23B 2251/125 . . Rounded cutting edges
- B23B 2251/127 . . Sharp cutting edges
  
- B23B 2251/14 . Configuration of the cutting part, i.e. the main cutting edges
  
- B23B 2251/18 . Configuration of the drill point
  
- B23B 2251/20 . Number of cutting edges
- B23B 2251/201 . . Single cutting edge
- B23B 2251/202 . . Three cutting edges
- B23B 2251/204 . . Four cutting edges
- B23B 2251/205 . . Five cutting edges
- B23B 2251/207 . . Six cutting edges
- B23B 2251/208 . . Eight cutting edges
  
- B23B 2251/24 . Overall form of drilling tools
- B23B 2251/241 . . Cross sections of the diameter of the drill
- B23B 2251/242 . . . increasing in a direction towards the shank from the tool tip
- B23B 2251/244 . . . decreasing in a direction towards the shank from the tool tip
- B23B 2251/245 . . . Variable cross sections
- B23B 2251/247 . . Drilling tools having a working portion at both ends of the shank
- B23B 2251/248 . . Drills in which the outer surface is of special form
  
- B23B 2251/28 . Arrangement of teeth
- B23B 2251/282 . . Unequal spacing of cutting edges in the circumferential direction
- B23B 2251/285 . . Cutting teeth arranged at different heights
- B23B 2251/287 . . Cutting edges having different lengths
  
- B23B 2251/40 . Flutes, i.e. chip conveying grooves
- B23B 2251/402 . . with increasing depth in a direction towards the shank from the tool tip
- B23B 2251/404 . . with decreasing depth in a direction towards the shank from the tool tip
- B23B 2251/406 . . of special form not otherwise provided for
- B23B 2251/408 . . Spiral grooves

- B23B 2251/42 . Types of drill
- B23B 2251/422 . . Deep hole drills, e.g. ejector drills
- B23B 2251/424 . . . Gun drills
- B23B 2251/426 . . Micro-drills
- B23B 2251/428 . . Drills for cutting plugs of material
  
- B23B 2251/44 . Margins, i.e. the area of the circumference following the axial cutting edge in the direction of rotation
- B23B 2251/443 . . Double margin drills
- B23B 2251/446 . . Drills with variable margins
  
- B23B 2251/46 . Drills having a centre free from cutting edges or with recessed cutting edges
  
- B23B 2251/48 . Chip breakers
  
- B23B 2251/50 . Drilling tools comprising cutting inserts
- B23B 2251/505 . . set at different heights
  
- B23B 2251/52 . Depth indicators
  
- B23B 2251/54 . Drilling tools having provision for drilling different diameters
  
- B23B 2251/56 . Guiding pads
  
- B23B 2251/58 . Guiding rolls
  
- B23B 2251/60 . Drills with pilots
- B23B 2251/603 . . Detachable pilots, e.g. in the form of a drill
- B23B 2251/606 . . . being a twist drill
  
- B23B 2251/62 . Drilling tools having means to reinforce the shank, e.g. drills having small shanks being gripped by devices having a larger shank
  
- B23B 2251/64 . Drills operating in the reverse direction, i.e. in the unscrewing direction of a right-hand thread
  
- B23B 2251/66 . Drills with provision to be used as a screwdriver
  
- B23B 2251/68 . Drills with provision for suction ([use of suction in turning, boring or drilling in general B23B 2270/62](#))
  
- B23B 2251/70 . Drills with vibration suppressing means
  
- B23B 2260/00 Details of constructional elements**
  
- B23B 2260/002 . Accumulators
  
- B23B 2260/004 . Adjustable elements
- B23B 2260/0045 . . Two elements adjustable relative to each other in three mutually perpendicular

## directions

- B23B 2260/008 . Bearings
- B23B 2260/0082 . . Sliding contact bearings
- B23B 2260/0085 . . Needle roller bearings
- B23B 2260/0087 . . Preloading of bearings
- B23B 2260/016 . Bolts
- B23B 2260/018 . Brushes
- B23B 2260/02 . Cams
- B23B 2260/022 . Balls
- B23B 2260/024 . Batteries
- B23B 2260/026 . Bushings, e.g. adapter sleeves
- B23B 2260/028 . Chains
- B23B 2260/03 . Clamps
- B23B 2260/032 . Diaphragms
- B23B 2260/034 . Drawbars
- B23B 2260/036 . Cables
- B23B 2260/038 . Cartridges
- B23B 2260/04 . Centre drills of known configuration, e.g. the provision of a centre drill in centres or chucks
- B23B 2260/042 . Collets of known configuration, i.e. devices using a collet
- B23B 2260/044 . Clutches
- B23B 2260/0445 . . Overload clutches
- B23B 2260/048 . Devices to regulate the depth of cut
- B23B 2260/0482 . . Depth controls, e.g. depth stops ([stops B23B 2260/12](#))
- B23B 2260/0485 . . Depth gauges
- B23B 2260/0487 . . Depth indicators ([indication scales L23B 260/88](#))
- B23B 2260/056 . Differential screw threads
- B23B 2260/058 . Dust covers ([dust covers in chucks B23B 2231/28](#), [nose pieces in chucks L231/44](#))
- B23B 2260/062 . Electric motors
- B23B 2260/0625 . . Linear motors

B23B 2260/066	. Electrostrictive elements
B23B 2260/068	. Flexible members
B23B 2260/07	. Gears
B23B 2260/072	. Grooves
B23B 2260/0725	. . Spiral
B23B 2260/076	. Harmonic drive gearboxes, i.e. reduction gearing including wave generator, flex spline and a circular spline
B23B 2260/078	. Hand tools used to operate chucks or to assemble, adjust or disassemble tools or equipment used for turning, boring or drilling
B23B 2260/0785	. . for unclamping cutting inserts
B23B 2260/082	. Holes
B23B 2260/084	. Hirth couplings
B23B 2260/088	. Indication scales
B23B 2260/09	. Knurled surfaces
B23B 2260/092	. Lasers
B23B 2260/094	. Levels, e.g. spirit levels
B23B 2260/096	. Levers
B23B 2260/098	. Magazines
B23B 2260/10	. Magnets
B23B 2260/102	. Magnetostrictive elements
B23B 2260/104	. Markings, i.e. symbols or other indicating marks
B23B 2260/106	. Nuts
B23B 2260/108	. Piezoelectric elements
B23B 2260/11	. Planetary drives
B23B 2260/112	. Projections
B23B 2260/114	. Rings
B23B 2260/116	. Rollers or rolls
B23B 2260/118	. Suction pads or vacuum cups, e.g. for attachment of guides to workpieces

<a href="#">B23B 2260/12</a>	. Stops ( <a href="#">depth controls</a> <a href="#">L23B 260/48C</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</a> <a href="#">B23B 2200/167</a> )
<a href="#">B23B 2260/134</a>	. Spacers or shims ( <a href="#">shims for supporting cutting inserts</a> <a href="#">B23B 2205/16</a> )
<a href="#">B23B 2260/136</a>	. Springs
<a href="#">B23B 2260/138</a>	. Screw threads
<a href="#">B23B 2260/1381</a>	.. Conical
<a href="#">B23B 2260/1383</a>	.. with round thread profile
<a href="#">B23B 2260/1385</a>	.. with square thread profile
<a href="#">B23B 2260/1386</a>	.. with trapezoidal thread profile
<a href="#">B23B 2260/1388</a>	.. with special profile not otherwise provided for
<a href="#">B23B 2260/142</a>	. Valves
<a href="#">B23B 2260/144</a>	. Wear indicators
<a href="#">B23B 2260/146</a>	. Wedges
<a href="#">B23B 2260/158</a>	. Worms and worm wheels
<b><a href="#">B23B 2265/00</a></b>	<b>Details of general geometric configurations</b>
<a href="#">B23B 2265/08</a>	. Conical
<a href="#">B23B 2265/12</a>	. Eccentric
<a href="#">B23B 2265/16</a>	. Elliptical
<a href="#">B23B 2265/32</a>	. Polygonal
<a href="#">B23B 2265/322</a>	.. Square
<a href="#">B23B 2265/324</a>	.. Pentagonal
<a href="#">B23B 2265/326</a>	.. Hexagonal
<a href="#">B23B 2265/328</a>	.. Octagonal
<a href="#">B23B 2265/34</a>	. Round
<a href="#">B23B 2265/36</a>	. Spherical

<b>B23B 2270/00</b>	<b>Details of turning, boring or drilling machines, processes or tools not otherwise provided for</b>
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 ( <a href="#">compensating centrifugal force B23B 2250/08</a> )
B23B 2270/06	. Use of elastic deformation
B23B 2270/08	. Clamping mechanisms; Provisions for clamping ( <a href="#">B23B 2210/00 takes precedence</a> )
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 ( <a href="#">machining or gripping of both internal and external surfaces B23B 2270/205</a> )
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 ( <a href="#">use of suction B23B 2270/62, drilling tools with provision for suction B23B 2251/68</a> )
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 ( <a href="#">magnets B23B 2260/10</a> )
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](#))