ECLA EUROPEAN CLASSIFICATION

B23B TURNING; BORING (arrangements for copying or controlling B23Q)

[N: **WARNING**
[C2012.01]
The following IPC groups are not used in the internal ECLA classification scheme.
Subject matter covered by these groups is classified in the following ECLA groups:

B23B3/18	covered by	B23B3/16
B23B3/20	covered by	B23B3/16
B23B3/28	covered by	B23B3/00
B23B5/22	covered by	B23B31/00
B23B5/24	covered by	B23Q27/00; B23B35/00
B23B5/30	covered by	B23Q35/00
B23B5/34	covered by	B23B31/00; B23B33/00
B23B5/42	covered by	B23Q35/00
B23B5/44	covered by	B23Q27/00
B23B7/08	covered by	B23B7/04
B23B7/14	covered by	B23B7/12
B23B7/16	covered by	B23B7/12
B23B9/04	covered by	B23B9/02
B23B9/06	covered by	B23B9/02
B23B9/10	covered by	B23B9/08
B23B9/12	covered by	B23B9/08
B23B15/00	covered by	B23Q7/00
B23B17/00	covered by	B23Q1/01; B23Q1/03; B23Q1/25
B23B19/00	covered by	B23Q1/70
B23B19/02	covered by	B23Q1/70
B23B21/00	covered by	B23Q1/00
B23B29/30	covered by	B23B29/28
B23B31/163	covered by	B23B31/16B
B23B31/165	covered by	B23B31/16C
B23B31/167	covered by	B23B31/16C
B23B31/169	covered by	B23B31/16D
B23B31/171	covered by	B23B31/16F
B23B31/173	covered by	B23B31/16G
B23B31/175	covered by	B23B31/16H
B23B31/177	covered by	B23B31/16K
B23B41/08	covered by	F16L41/04
B23B45/14	covered by	B25H1/00C
B23B45/16	covered by	B25D16/00
B23B47/02	covered by	B23Q5/00
B23B47/04	covered by	B23Q5/00
B23B47/06	covered by	B23Q5/00
B23B47/08	covered by	B23Q5/00
B23B47/10	covered by	B23Q5/00
B23B47/12	covered by	B23Q5/00
B23B47/14	covered by	B23Q5/00
B23B47/16	covered by	B23Q5/00
B23B47/18	covered by	B23Q5/00
B23B47/20	covered by	B23Q5/00
B23B47/22	covered by	B23Q5/00
B23B47/24	covered by	B23Q16/00

]

Guide heading: **Turning**

B23B1/00 **Methods for turning or working essentially requiring the use of turning-machines; Use of auxiliary equipment in connection with such methods**

B23B3/00 **General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines**

B23B3/02 . Small lathes, e.g. for toolmakers (specially designed for watchmakers G04D3/00) [C9906]

B23B3/04 . Turning-machines in which the workpiece is rotated by means at a distance from the headstock

B23B3/06 . Turning-machines or devices characterised only by the special arrangement of constructional units (B23Q37/00 takes precedence; structural features of details, see the relevant groups; such features of general applicability B23Q)

B23B3/06B . . [N: Arrangements for performing other machining operations, e.g. milling, drilling]

B23B3/08 . Turning-machines characterised by the use of faceplates

B23B3/10 . . with the faceplate horizontal, i.e. vertical boring and turning machines

B23B3/12 . . with the faceplate vertical, i.e. face lathes

B23B3/14 . . Mountings or drives of faceplates [N: (rotatable members, e.g. faceplates B23Q1/50)] [C9601]

B23B3/16 . Turret lathes for turning individually-chucked workpieces [N: (turrets B23B29/24)]

B23B3/16B . . [N: lathe with one toolslide carrying one turret head]

B23B3/16B1 . . . [N: Arrangements for performing other machining operations, e.g. milling, drilling]

B23B3/16C . . [N: lathe with one toolslide carrying two or more turret heads]

B23B3/16C1 . . . [N: Arrangements for performing other machining operations, e.g. milling, drilling]

B23B3/16D . . [N: lathe with two or more toolslides carrying turrets]

B23B3/16D1 . . . [N: Arrangements for performing other machining operations, e.g. milling, drilling]

B23B3/22 . Turning-machines or devices with rotary tool heads [N: (B23B5/08, B23B5/14 and B23B5/16 take precedence)]

B23B3/24 . . the tools of which do not perform a radial movement; Rotary tool heads therefor

B23B3/26 . . the tools of which perform a radial movement; Rotary tool heads thereof

B23B3/26B . . . [N: Surfacing or grooving flanges]

B23B3/30 . Turning-machines with two or more working-spindles, e.g. in fixed arrangement

B23B3/32 . . for performing indentical operations simultaneously on two or more workpieces

B23B3/34 . Short turning-machines with one or multiple working-spindles attended from the end (B23B3/12 takes precedence)

B23B3/36 . Associations of only turning-machines directed to a particular metal-working result (if the metal-working result is not essential B23Q39/00)

B23B5/00 **Turning-machines or devices specially adapted for particular work; Accessories specially adapted therefor**

B23B5/02 . for turning hubs or brake drums (B23B5/04 takes precedence)

B23B5/04 . for reconditioning hubs or brake drums or axle spindles without removing same from the vehicle

B23B5/06 . for turning valves or valve bodies [N: (turning conical surfaces in general B23B5/38; tools for working valve seats B23B51/10H)]

B23B5/08 . for turning axles, bars, rods, tubes, rolls, i.e. shaft-turning lathes, roll lathes; Centreless turning

B23B5/10 . . for turning pilgrim rolls

B23B5/12 . . for peeling bars or tubes by making use of cutting bits arranged around the workpiece (otherwise than by turning B23D79/12)

B23B5/14 . Cutting-off lathes (shearing B23D) [N: B23D21/00 takes precedence]

B23B5/16 . for bevelling, chamfering, or deburring the ends of bars or tubes [C9906]

B23B5/16B . . [N: Devices attached to the workpiece]

B23B5/16B1 . . . [N: with an internal clamping device]

B23B5/16B2 . . . [N: with an external clamping device]

B23B5/16C . . [N: Workpieces clamped on a bench, e.g. a vice]

B23B5/16D . . [N: Devices for working electrodes] [N9906]

B23B5/16F . . [N: Tools for chamfering the ends of bars or tubes] [N9906]

B23B5/16F1 . . . [N: with guiding devices] [N9906]

B23B5/18 . for turning crankshafts, eccentrics, or cams, e.g. crankpin lathes

B23B5/20 . . without removing same from the engine

B23B5/26 . for simultaneously turning internal and external surfaces of a body

B23B5/28 . for turning wheels or wheel sets or cranks thereon, i.e. wheel lathes

B23B5/32 . . for reconditioning wheel sets without removing same from the vehicle; Underfloor wheel lathes for railway vehicles

B23B5/36 . for turning specially-shaped surfaces by making use of relative movement of the tool and work produced by geometrical mechanisms, i.e. forming-lathes

B23B5/36B . . [N: for toroidal surfaces]

B23B5/38 . . for turning conical surfaces inside or outside, e.g. taper pins [N: (for turning valves or valve bodies B23B5/06)]

B23B5/40 . . for turning spherical surfaces inside or outside

B23B5/46 . . for turning helical or spiral surfaces (thread cutting B23G)

B23B5/48 . . . for cutting grooves, e.g. oil grooves of helicoidal shape

B23B7/00 **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** [N: (arrangements or accessories for enabling machine tools not specially designed only for thread cutting to be used for this purpose B23G3/00)]

B23B7/02 . Automatic or semi-automatic machines for turning of stock

B23B7/04 . . Turret machines

B23B7/06 . . with sliding headstock

B23B7/10 . . Accessories, e.g. guards [N: (guards B23Q11/08 takes precedence)]

B23B7/12 . Automatic or semi-automatic machines for turning of workpieces

B23B9/00 **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 B23B7/00)

B23B9/00B . [N: Spindle carriers: constructional details, drives for the spindles, or the like]

B23B9/02 . Automatic or semi-automatic machines for turning of stock

B23B9/08 . Automatic or semi-automatic machines for turning of workpieces

B23B11/00 **Automatic or semi-automatic turning-machines incorporating equipment for performing other working procedures, e.g. slotting, milling, rolling** [N: (B23B3/06B and B23B3/16 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 B23Q39/04)]

B23B13/00 **Arrangements for automatically conveying or chucking or guiding stock**

B23B13/02 . for turning-machines with a single working-spindle

B23B13/02B . . [N: Feeding device having intermittent movement]

B23B13/02B1 . . . [N: being placed in the spindle]

B23B13/02B1B . . . . [N: including two collets]

B23B13/02C . . [N: with stock drum]

B23B13/02D . . [N: Feeding by pistons under fluid-pressure]

B23B13/02F . . [N: the material being fed from a reel]

B23B13/04 . for turning-machines with a plurality of working-spindles

B23B13/06 . Arrangements for switching-off the drive of turning-machines after the stock has been completely machined

B23B13/08 . Arrangements for reducing vibrations in feeding-passages or for damping noise (damping noise in general G10K)

B23B13/10 . with magazines for stock

B23B13/12 . Accessories, e.g. stops, grippers

B23B13/12B . . [N: Stops (stops for equipment for precise positioning of tool or work into particular locations not otherwise provided for B23Q16/00)]

B23B13/12C . . [N: Grippers, pushers or guiding tubes (arrangements for reducing vibrations in

feeding-passages or for damping noise B23B13/08)]

B23B13/12C1 . . . [N: Feed collets (feeding device having intermittent movement being placed in the spindle including two collets B23B13/02B1B; collet chucks B23B31/20)]

B23B13/12D . . [N: Supports]

B23B13/12F . . [N: Stock rest handling devices, e.g. ejectors]

Guide heading: **Components or accessories particularly for turning machines**

B23B23/00 **Tailstocks; Centres** [N: (for grinding machines B24B41/06B1)]

B23B23/00B . [N: the centres being adjustable]

B23B23/02 . Dead centres

B23B23/02B . . [N: the centres being adjustable]

B23B23/04 . Live centres

B23B23/04B . . [N: the centres being adjustable]

B23B25/00 **Accessories or auxiliary equipment for turning-machines** (for machine tools in general B23Q; cooling or lubricating B23Q11/12)

B23B25/02 . Arrangements for chip-breaking in turning-machines (on cutting tools B23B27/22)

B23B25/04 . Safety guards specially designed for turning machines ([N: B23Q11/08 takes precedence;] in general F16P)

B23B25/06 . 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)

B23B25/06B . . [N: Tool setting height gauges]

B23B27/00 **Tools for turning or boring machines** (for drilling machines B23B51/00)**; Tools of a similar kind in general; Accessories therefor** [N: Note: all subgroups except B23B27/12 relate to tools with a shank]

B23B27/00B . [N: with vibration damping means]

B23B27/00C . [N: Geometry of the chip-forming or the clearance planes, e.g. tool angles (B23B27/14B and B23B27/22 take precedence)]

B23B27/00D . [N: for internal turning (boring bars B23B29/02, boring heads B23B29/03; milling cutters B23C5/00; reamers B23D77/00)]

B23B27/02 . Cutting tools with straight main part and cutting edge at an angle (B23B27/04 to B23B27/08 take precedence)

B23B27/04 . Cutting-off tools (B23B27/08 takes precedence; [N: toolholders for cutting-off inserts B23B29/04B]) [C9906]

B23B27/04B . . [N: with chip-breaking arrangements]

B23B27/06 . profile cutting tools, i.e. forming-tools

B23B27/06B . . [N: Thread-turning tools]

B23B27/08 . Cutting tools with blade- or disc-like main parts [N: (with disc-like main parts B23B27/08B)]

B23B27/08B . . [N: Cutting tools with disc-like main parts]

B23B27/08C . . [N: with yieldable support for the cutting insert] [C9906]

B23B27/10 . Cutting tools with special provision for cooling [N: (drills with lubricating or cooling equipment B23B51/06; features relating to lubricating or cooling of milling cutters B23C5/28; arrangements or devices for cooling or lubricating tools or work B23Q11/10)]

B23B27/12 . . with a continuously-rotated circular cutting edge; holders therefor

B23B27/14 . Cutting tools of which the bits or tips [N: or cutting inserts] are of special material [C9906]

B23B27/14B . . [N: 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, B23B27/16B; with removable plate-like milling cutting inserts of special shape B23C5/20B)] [C9906]

B23B27/14B3 . . . [N: characterised by having chip-breakers]

B23B27/14B4 . . . [N: characterised by having a special shape]

B23B27/14B4B . . . . [N: Means to improve the adhesion between the substrate and the coating] [N9906]

B23B27/14C . . [N: Composition of the cutting inserts] [C9906]

B23B27/16 . . with exchangeable cutting bits [N: or cutting inserts], e.g. able to be clamped [C9906]

B23B27/16B . . . [N: with specially shaped plate-like exchangeable cutting inserts, e.g. chip-breaking groove (B23B27/16C to B23B27/16G take precedence)] [C9906]

B23B27/16B3 . . . . [N: characterised by having chip-breakers]

B23B27/16B4 . . . . [N: characterised by having a special shape]

B23B27/16C . . . [N: 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 (B23B27/16F takes precedence)] [C9906]

B23B27/16C3 . . . . [N: characterised by having chip-breakers]

B23B27/16C4 . . . . [N: characterised by having a special shape]

B23B27/16D . . . [N: with plate-like cutting inserts of special shape clamped by a clamping member acting almost perpendicularly on the chip-forming plane (B23B27/16F takes precedence)] [C9906]

B23B27/16D1 . . . . [N: in which the clamping member breaks the chips]

B23B27/16D2 . . . . [N: in which the chip-breaking clamping member is adjustable]

B23B27/16D3 . . . . [N: characterised by having chip-breakers]

B23B27/16D4 . . . . [N: characterised by having a special shape]

B23B27/16F . . . [N: 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] [C9906]

B23B27/16F3 . . . . [N: characterised by having chip-breakers]

B23B27/16F4 . . . . [N: characterised by having a special shape]

B23B27/16G . . . [N: Adjustable position of the plate-like cutting inserts of special form] [C9906]

B23B27/16N . . . [N: with plate-like exchangeable cutting inserts (B23B27/16P to B23B27/16W take precedence)] [C9906]

B23B27/16P . . . [N: 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 (B23B27/16R takes precedence)] [C9906]

B23B27/16Q . . . [N: with plate-like cutting inserts clamped by a clamping member acting almost perpendicularly on chip-forming plane (B23B27/16R takes precedence)] [C9906]

B23B27/16Q1 . . . . [N: in which the clamping member breaks the chips]

B23B27/16Q2 . . . . [N: in which the chip-breaking clamping member is adjustable]

B23B27/16R . . . [N: 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] [C9906]

B23B27/16W . . . [N: Adjustable position of the plate-like cutting inserts] [C9906]

B23B27/16Y . . . [N: Adjustable position of the cutting inserts (B23B27/16G and B23B27/16W take precedence)] [C9906]

B23B27/16Y1 . . . . [N: Height of the cutting tip adjustable]

B23B27/16Y2 . . . . [N: Angular position of the cutting insert adjustable around an axis parallel to the chip-forming plane] [C9906]

B23B27/16Y3 . . . . [N: Angular position of the cutting insert adjustable around an axis generally perpendicularly to the chip-forming plane] [C9906]

B23B27/18 . . with cutting bits or tips [N: or cutting inserts] rigidly mounted, e.g. by brazing [C9906]

B23B27/20 . . . with diamond bits [N: or cutting inserts] [C9906]

B23B27/22 . Cutting tools with chip-breaking equipment [N: (B23B27/04B, B23B27/14B3, B23B27/16 take precedence; arrangements for chip-breaking B23B25/02; for milling tools B23C5/16B)]

B23B27/24 . Knurling tools

B23B29/00 **Holders for non-rotary cutting tools** (B23B27/12 takes precedence)**; Boring bars or boring heads; Accessories for tool holders**

B23B29/02 . Boring bars

B23B29/02B . . [N: with vibration reducing means]

B23B29/02C . . [N: Boring toolholders fixed on the boring bar]

B23B29/02D . . [N: Steadies for boring bars (auxiliary devices, e.g. steadies, rests B23Q1/76)] [C9601]

B23B29/03 . Boring heads

B23B29/034 . . with tools moving radially, e.g. for making chamfers or undercuttings

B23B29/034B . . . [N: radially adjustable before starting manufacturing]

B23B29/034B1 . . . . [N: by means of screws and nuts] [N1007]

B23B29/034B1C . . . . . [N: Cartridges] [N1007]

B23B29/034B1H . . . . . [N: adjustment of the tool placed in the hole being possible] [N1007]

B23B29/034B3 . . . . [N: by means of inclined planes] [N1007]

B23B29/034B5 . . . . [N: by pivoting the tool carriers or by elastic deformation] [N1007]
B23B29/034B7 . . . . [N: by means of gears and racks] [N1007]
B23B29/034B9 . . . . [N: by means of an eccentric] [N1007]
B23B29/034N . . . [N: radially adjustable during manufacturing]
B23B29/034N3 . . . . [N: by means of screws and nuts] [N1007]
B23B29/034N3B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N3G . . . . . [N: Grooving tool] [N1007]
B23B29/034N4 . . . . [N: by means of inclined planes] [N1007]
B23B29/034N4B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N4G . . . . . [N: Grooving tool] [N1007]
B23B29/034N5 . . . . [N: by pivoting the tool carriers or by elastic deformation] [N1007]
B23B29/034N5B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N5G . . . . . [N: Grooving tool] [N1007]
B23B29/034N6 . . . . [N: by means of gears and racks] [N1007]
B23B29/034N6B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N6G . . . . . [N: Grooving tool] [N1007]
B23B29/034N7 . . . . [N: by means of an eccentric] [N1007]
B23B29/034N7B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N7G . . . . . [N: Grooving tool] [N1007]
B23B29/034N9 . . . . [N: Adjustment means not specified or not covered by the groups B23B29/034N3 to B23B29/034N7] [N1007]
B23B29/034N9B . . . . . [N: Boring and facing heads] [N1007]
B23B29/034N9G . . . . . [N: Grooving tool] [N1007]

B23B29/04 . Tool holders for a single cutting tool
B23B29/04B . . [N: with cutting-off, grooving or profile cutting tools, i.e. blade- or disc-like main cutting parts (B23B29/14 takes precedence)]
B23B29/04C . . [N: with an intermediary toolholder]
B23B29/06 . . Tool holders equipped with longitudinally-arranged grooves for setting the cutting tool
B23B29/08 . . Tool holders equipped with grooves arranged crosswise to the longitudinal direction for setting the cutting tool
B23B29/10 . . . with adjustable counterbase for the cutting tool
B23B29/12 . . Special arrangements on tool holders
B23B29/12B . . . [N: Vibratory toolholders]
B23B29/14 . . . affording a yielding support of the cutting tool, e.g. by spring clamping [N: (cutting tools with yieldable support for the cutting insert B23B27/08C)] [C9906]
B23B29/16 . . . for supporting the workpiece in a backrest
B23B29/18 . . . for retracting the cutting tool
B23B29/20 . . . for placing same by shanks in sleeves of a turret
B23B29/20B . . . . [N: the tools being adjustable]
B23B29/22 . . . for tool adjustment by means of shims or spacers

B23B29/24 . Tool holders for a plurality of cutting tools, e.g. turrets [N: (indexing devices B23Q16/00)]

B23B29/24B . . [N: Turrets, without description of the angular positioning device (turret lathes for turning individually-chucked workpieces B23B3/16; turrets with manually operated angular positioning devices B23B29/28B; turrets with power operated angular positioning devices B23B29/32B)]

B23B29/24C . . [N: Toolposts, i.e. clamping quick-change toolholders, without description of the angular positioning device (toolposts with manually operated angular positioning devices B23B29/28C; toolposts with power operated angular positioning devices B23B29/32C)]

B23B29/24C1 . . . [N: Quick-change tool holders]

B23B29/24D . . [N: with individually adjustable toolholders] [N9906]

B23B29/26 . . Tool holders in fixed position

B23B29/28 . . Turrets manually adjustable about a vertical [N: or horizontal] pivot [N: (indexing devices B23Q16/00)] [C1201]

B23B29/28B . . . [N: Turrets with manually operated angular positioning devices]

B23B29/28C . . . [N: Toolposts with manually operated angular positioning devices]

B23B29/28D . . . [N: Turret toolholder with manually operated angular positioning devices]

B23B29/32 . . Turrets adjustable by power drive, i.e. turret heads [N: (indexing devices B23Q16/00)]

B23B29/32B . . . [N: Turrets with power operated angular positioning devices]

B23B29/32C . . . [N: Toolposts with power operated angular positioning devices]

B23B29/34 . . Turrets equipped with triggers for releasing the cutting tools

B23B31/00 **Chucks** [N: (allowing axial oscillation of percussion tool bits B25D17/08)]**; Expansion mandrels; Adaptations thereof for remote control** (faceplates B23Q1/50; devices for securing work or tools to spindles in general B23Q3/12; rotary devices holding by magnetic and/or electrical force acting directly on work B23Q3/152) [C9601]

B23B31/00B . [N: Protection against entering of chips or dust]

B23B31/00C . [N: Work or tool ejection means]

B23B31/00D . [N: Cylindrical shanks of tools]

B23B31/00F . [N: Conical shanks of tools]

B23B31/00T . [N: with arrangements for transmitting torque] [N9906]

B23B31/02 . Chucks

B23B31/02B . . [N: Faceplates] [C9601]

B23B31/02C . . [N: for screw-threads]

B23B31/02D . . [N: for gears]

B23B31/02F . . [N: the radial or angular position of the tool being adjustable (boring heads with tools moving radially B23B29/034; holding tools yieldably B23B31/08; with means for adjusting the chuck with respect to the working spindle B23B31/36)] [N9906]

B23B31/02G . . [N: the axial positioning of the tool being adjustable (B23B31/20C takes precedence; with means for adjusting the chuck with respect to the working spindle B23B31/36)] [N9906]

B23B31/06 . . Features relating to the removal of tools; Accessories therefor

B23B31/07 . . . Ejector wedges

B23B31/08 . . Holding tools yieldably

B23B31/08B . . . [N: axially]

B23B31/08B1 . . . . [N: having an overload clutch]

B23B31/10 . . characterised by the retaining or gripping devices or their immediate operating means

Note
Group B23B31/12 takes precedence over groups [N: B23B31/10B, B23B31/10C,] B23B31/103 to B23B31/117

B23B31/10B . . . [N: Chucks with separately-acting jaws movable radially (B23B31/16B1D, B23B31/16C1D, B23B31/16D1D, B23B31/16F1D, B23B31/16G1D, B23B31/16H1D, B23B31/16K1D and B23B31/16L3 take precedence; Chucks with simultaneously-acting jaws moving radially B23B31/16)] [C9906]

B23B31/10C . . . [N: Jaws, accessories or adjustment means (B23B31/16B1, B23B31/16C1, B23B31/16D1, B23B31/16F1, B23B31/16G1, B23B31/16H1, B23B31/16K1, B23B31/16L take precedence)]

B23B31/103 . . . Retention by pivotal elements, e.g. catches, pawls

B23B31/107 . . . Retention by laterally-acting detents, e.g. pins, screws, wedges; Retention by loose elements, e.g. balls

B23B31/107B . . . . [N: Retention by balls (balls acting as jaws B23B31/22)] [N9907]

B23B31/107C . . . . [N: Retention by cylindrical elements (cylindrical elements acting as jaws B23B31/22)] [N9906]

B23B31/107D . . . . [N: Retention by conical elements (conical elements acting as jaws B23B31/22)] [N9906]

B23B31/107P . . . . [N: Retention by pins] [N9906]

B23B31/107S . . . . [N: Retention by screws] [N9906]

B23B31/107S1 . . . . . [N: with conical ends] [N9906]

B23B31/107S2 . . . . . [N: acting on a floating pin] [N9906]

B23B31/107W . . . . [N: Retention by wedges] [N9906]

B23B31/11 . . . Retention by threaded connection

B23B31/11B . . . . [N: for conical parts]

B23B31/11B2 . . . . . [N: using conical threads] [N1204]

B23B31/11B4 . . . . . [N: using cylindrical threads] [N1204]

B23B31/113 . . . Retention by bayonet connection

B23B31/117 . . . Retention by friction only, e.g. using springs, resilient sleeves, tapers

B23B31/117B . . . . [N: not used, see subgroups and B23B31/117] [C9601]

B23B31/117B2 . . . . . [N: using fluid-pressure means to actuate the gripping means]

B23B31/117C . . . . [N: using springs]

B23B31/117C2 . . . . . [N: using fluid-pressure means to actuate the gripping means]

B23B31/117D . . . . [N: using elastomer rings or sleeves]

B23B31/117D2 . . . . . [N: using fluid-pressure means to actuate the gripping means]

B23B31/117F . . . . [N: using resilient metallic rings or sleeves]

B23B31/117F2 . . . . . [N: using fluid-pressure means to actuate the gripping means]

B23B31/117H . . . . [N: using heating and cooling] [N1204]

B23B31/12 . . . Chucks with simultaneously-acting jaws, whether or not also individually adjustable

B23B31/12B . . . . [N: moving obliquely to the axis of the chuck in a plane containing this axis]
B23B31/12B1 . . . . . [N: Details of the jaws]
B23B31/12B2 . . . . . [N: using fluid-pressure means in the chuck to actuate the gripping means]
B23B31/12B3 . . . . . [N: with locking arrangements (locking arrangements for chucks with simultaneously-acting jaws moving radially actuated by one or more spiral grooves B23B31/16B5)]
B23B31/12B4 . . . . . [N: Jaws movement actuated by a nut with conical screw-thread]
B23B31/12B5 . . . . . [N: Jaws movement actuated by a bolt with conical screw-thread]
B23B31/12B6 . . . . . [N: Jaws movement actuated by an axially movable member]
B23B31/12C . . . . [N: pivotally movable in a radial plane]
B23B31/12C1 . . . . . [N: Details of the jaws]
B23B31/12C2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/12C3 . . . . . [N: with a centre]
B23B31/12C4 . . . . . [N: using mechanical transmission through the spindle]
B23B31/14 . . . . involving the use of a centrifugal force
B23B31/16 . . . . moving radially
B23B31/16B . . . . . [N: Jaws movement actuated by one or more spiral grooves]
B23B31/16B1 . . . . . [N: Details of the jaws]
B23B31/16B1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16B1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16B1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16B2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16B2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16B3 . . . . . [N: with a centre]
B23B31/16B4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16B2B takes precedence)]
B23B31/16B5 . . . . . [N: 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 B23B31/12B3)]
B23B31/16C . . . . . [N: Jaws movement actuated by screws and nuts or oblique racks]
B23B31/16C1 . . . . . [N: Details of the jaws]
B23B31/16C1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16C1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16C1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16C2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16C2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16C3 . . . . . [N: with a centre]
B23B31/16C4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16C2B takes precedence)]
B23B31/16D . . . . . [N: Jaws movement actuated by gears and racks]
B23B31/16D1 . . . . . [N: Details of the jaws]
B23B31/16D1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16D1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]

B23B31/16D1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16D2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16D2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16D3 . . . . . [N: with a centre]
B23B31/16D4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16D2B takes precedence)]
B23B31/16F . . . . . [N: Jaws movement actuated by cam surface in a radial plane]
B23B31/16F1 . . . . . [N: Details of the jaws]
B23B31/16F1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16F1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16F1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16F2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16F2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16F3 . . . . . [N: with a centre]
B23B31/16F4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16F2B takes precedence)]
B23B31/16G . . . . . [N: Jaws movement actuated by coaxial conical surfaces]
B23B31/16G1 . . . . . [N: Details of the jaws]
B23B31/16G1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16G1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16G1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16G2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16G2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16G3 . . . . . [N: with a centre]
B23B31/16G4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16G2B takes precedence)]
B23B31/16H . . . . . [N: Jaws movement actuated by levers moved by a coaxial control rod]
B23B31/16H1 . . . . . [N: Details of the jaws]
B23B31/16H1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16H1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16H1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16H2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16H2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/16H3 . . . . . [N: with a centre]
B23B31/16H4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16H2B takes precedence)]
B23B31/16K . . . . . [N: Jaws movement actuated by oblique surfaces of a coaxial control rod]
B23B31/16K1 . . . . . [N: Details of the jaws]
B23B31/16K1B . . . . . {7 dots} [N: Form of the jaws] [N9906]
B23B31/16K1C . . . . . {7 dots} [N: Fixation on the master jaw] [N9906]
B23B31/16K1D . . . . . {7 dots} [N: Individually adjustable jaws] [N9906]
B23B31/16K2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16K2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]

B23B31/16K3 . . . . . [N: with a centre]
B23B31/16K4 . . . . . [N: using mechanical transmission through the spindle (B23B31/16K2B takes precedence)]
B23B31/16L . . . . . [N: Details of the jaws]
B23B31/16L1 . . . . . [N: Form of the jaws] [N9906]
B23B31/16L2 . . . . . [N: Fixation on the master jaw] [N9906]
B23B31/16L3 . . . . . [N: Indivudually adjustable jaws] [N9906]
B23B31/16M . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/16N . . . . . [N: with a centre]
B23B31/16P . . . . . [N: with means preventing the ejection of the jaws]
B23B31/18 . . . . pivotally movable in planes containing the axis of the chuck
B23B31/18B . . . . . [N: moving first parallel to the axis then pivotally in planes containing the axis of the chuck]
B23B31/19 . . . . moving parallel to the axis of the chuck [N: (B23B31/18B takes precedence)]
B23B31/20 . . . . Longitudinally-split sleeves, e.g. collet chucks
B23B31/20B . . . . . [N: characterised by features relating primarily to remote control of the gripping means]
B23B31/20B1 . . . . . [N: Details of the jaws]
B23B31/20B2 . . . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/20B2B . . . . . {7 dots} [N: using mechanical transmission through the spindle]
B23B31/20B4 . . . . . [N: using mechanical transmission through the spindle (B23B31/20B2B takes precedence)]
B23B31/20C . . . . . [N: with a tool positioning stop (axial positioning of the tool being adjustable B23B31/02G)] [C1201]
B23B31/22 . . . . Jaws in the form of balls [N: (retention by balls B23B31/107B)] [C9906]
B23B31/22C . . . . . [N: Jaws in the form of cylindrical elements (Retention by cylindrical elements B23B31/107C)] [C9906]
B23B31/22D . . . . . [N: Jaws in the form of conical elements (Retention by conical elements B23B31/107D)] [C9906]
B23B31/24 . . characterised by features relating primarily to remote control of the gripping means [N: (B23B31/20B takes precedence)]
B23B31/26 . . . using mechanical transmission through the working-spindle [N: (B23B31/16 and B23B31/40 take precedence)]
B23B31/26B . . . . [N: clamping the end of the toolholder shank]
B23B31/26B1 . . . . . [N: by means of balls]
B23B31/26B2 . . . . . [N: by means of collets]
B23B31/26B3 . . . . . [N: using a threaded spindle]
B23B31/26B4 . . . . . [N: using a bayonet connection]
B23B31/28 . . . using electric or magnetic means in the chuck
B23B31/30 . . . using fluid-pressure means in the chuck [N: (B23B31/10 and B23B31/40 take precedence)]
B23B31/30B . . . . [N: Hydraulic equipment, e.g. pistons, valves, rotary joints]
B23B31/30C . . . . [N: the gripping means is a deformable sleeve]
B23B31/30D . . . . [N: Vacuum chucks]
B23B31/32 . . with jaws carried by diaphragm

B23B31/34 . . with means enabling the workpiece to be reversed or tilted
B23B31/36 . . with means for adjusting the chuck with respect to the working-spindle
B23B31/38 . . with overload clutches [N: (B23B31/08B1 takes precedence)]
B23B31/39 . . Jaw changers

B23B31/40 . Expansion mandrels
B23B31/40B . . [N: Gripping the work or tool by a split sleeve (collet chucks B23B31/20)]
B23B31/40B1 . . . [N: Details of the jaws]
B23B31/40B2 . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/40B2B . . . . [N: using mechanical transmission through the spindle]
B23B31/40B4 . . . [N: using mechanical transmission through the spindle (B23B31/40B2B takes precedence)]
B23B31/40C . . [N: Gripping the work or tool by jaws moving radially controlled by conical surfaces (see also B23B31/16G)]
B23B31/40C1 . . . [N: Details of the jaws]
B23B31/40C2 . . . [N: using fluid-pressure means to actuate the gripping means]
B23B31/40C2B . . . . [N: using mechanical transmission through the spindle]
B23B31/40C4 . . . [N: using mechanical transmission through the spindle (B23B31/40C2B takes precedence)]
B23B31/40D . . [N: Gripping the work or tool between planes almost perpendicular to the axis]
B23B31/40F . . [N: Work or tool supported by two conical surfaces]
B23B31/40G . . [N: Work or tool gripped by a roller movable on an inclined plane]
B23B31/40H . . [N: Tube supporting means including a centerhole]
B23B31/42 . . characterised by features relating primarily to remote control of the gripping means

B23B33/00 **Drivers; Driving centres, Nose clutches, e.g. lathe dogs**

B23B33/00B . [N: Drivers with driving pins or the like]

Guide heading: **Boring; Drilling** (for surgical purposes A61B17/16; in metal using electric current B23H9/14; by laser beam B23K26/00; earth or rock drilling E21B)

B23B35/00 **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**

B23B35/00B . [N: Measures for preventing splittering]

B23B37/00 **Boring by making use of ultrasonic energy** (essentially using abrasive material B24B, e.g. B24B1/04)

B23B39/00 **General-purpose boring or drilling machines or devices; Sets of boring and/or drilling machines**

B23B39/00B . [N: Drilling machine situated underneath the workpiece]

B23B39/00C . [N: Portal drilling machines]

B23B39/02 . Boring machines; Combined horizontal boring and milling machines

B23B39/04 . Co-ordinate boring or drilling machines; Machines for making holes without previous marking

B23B39/06 . . Equipment for positioning work

B23B39/08 . . Devices for programme control

B23B39/10 . characterised by the drive, e.g. by fluid-pressure drive pneumatic power drive

B23B39/12 . Radial drilling machines

B23B39/14 . 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

B23B39/16 . Drilling machines with a plurality of working-spindles; Drilling automatons

B23B39/16B . . [N: with parallel work spindles]

B23B39/16B1 . . . [N: having gear transmissions]

B23B39/16B2 . . . [N: having crank pin transmissions]

B23B39/16B3 . . . [N: having universal joint transmissions]

B23B39/16B4 . . . [N: having flexible shaft transmissions]

B23B39/16B5 . . . [N: having belt and chain transmissions]

B23B39/16C . . [N: with the work spindles being oblique to each other]

B23B39/18 . . Setting work or tool carrier along a straight index line

B23B39/20 . . Setting work or tool carrier along a circular index line; Turret head drilling machines

B23B39/20B . . . [N: Turret head drilling machines]

B23B39/22 . . with working-spindles in opposite headstocks

B23B39/24 . . designed for programme control

B23B39/26 . in which the working position of tool or work is controlled by copying discrete points of a pattern (features of copying devices B23Q35/02)

B23B39/28 . Associations of only boring or drilling machines directed to a particular metal-working result (if not producing a particular metal-working result B23Q39/00)

B23B41/00 **Boring or drilling machines or devices specially adapted for particular work** [N: (surgical drilling machines A61B17/16M)]**; Accessories specially adapted therefor** [C9501]

B23B41/00C . [N: for drilling elongated pieces, e.g. beams]

B23B41/00C1 . . [N: the machining device being moved along a fixed workpiece]

B23B41/02 . for boring deep holes; Trepanning, e.g. of gun or rifle barrels

B23B41/04 . for boring polygonal or other non-circular holes

B23B41/06 . for boring conical holes

B23B41/10 . for boring holes in steam boilers

B23B41/12 . for forming working surfaces of cylinders, of bearings, e.g. in heads of driving rods, or of other engine parts

B23B41/14 . for very small holes

B23B41/16 . for boring holes with high-quality surface

B23B43/00 **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 B23B41/00)

B23B43/02 . to the tailstock of a lathe

B23B45/00 **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 B25F5/00)

B23B45/00C . [N: Housing of the drill, e.g. handgrip]

B23B45/00D . [N: Attachments]

B23B45/00D1 . . [N: Flexible shafts]

B23B45/00F . [N: Keys for operating the chucks]

B23B45/00G . [N: Gear boxes, clutches, bearings, feeding mechanisms or like equipment]

B23B45/02 . driven by electric power

B23B45/04 . driven by fluid-pressure or pneumatic power

B23B45/04B . . [N: Turbine motors]

B23B45/04C . . [N: Rotary vane type motors]

B23B45/04D . . [N: Piston engines]

B23B45/04D1 . . . [N: Internal combustion piston engines]

B23B45/06 . driven by man-power

B23B45/08 . . for drilling rails or profiled stock

B23B45/10 . . by using a fiddle bow or a belt

B23B45/12 . . by using a ratchet brace

Guide heading: **Components or accessories for boring or drilling machines**

B23B47/00 **Constructional features of components specially designed for boring or drilling machines; Accessories therefor** (working-spindles, bearing sleeves therefor B23Q1/70; for machine tolls in general B23Q) [C9906]

B23B47/26 . Liftable or lowerable drill heads or headstocks; Balancing arrangements therefor [N: (weight and flexion compensation B23Q11/00C)]

B23B47/28 . Drill jigs for workpieces (equipment for setting or guiding the drill B23B49/00)
B23B47/28B . . [N: Jigs for drilling cylindrical parts]
B23B47/28C . . [N: Jigs for drilling spherical parts]
B23B47/28D . . [N: Jigs for drilling rivets or bolts]
B23B47/28F . . [N: Jigs for drilling ski bindings]
B23B47/28G . . [N: Jigs for drilling plate-like workpieces (templates for marking the position of fittings on wings or frames E05D11/00B)] [C9906]
B23B47/28G1 . . . [N: involving dowelling]

B23B47/30 . Additional gear with one or more working-spindles attachable to the main working-spindle and mounting the additional gear [N: (multi-spindle drilling machines B23B39/16)]

B23B47/32 . Arrangements for preventing the running-out of drills or fracture of drills when getting through

B23B47/34 . Arrangements for removing chips out of the holes made; Chip- breaking arrangements attached to the tool [N: (chip-breaking in turning machines B23B25/02; in turning tools B23B27/22)]

B23B49/00 **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 B25H7/00; measuring devices, gauges G01B)

B23B49/00B . [N: Devices for detecting or indicating failure of drills]

B23B49/00C . [N: Stops attached to drilling tools, tool holders or drilling machines (B23B51/10F takes precedence)]
B23B49/00C1 . . [N: Attached to the drill] [N9906]
B23B49/00C2 . . [N: Attached to drilling machines] [N9906]
B23B49/00C2B . . . [N: Attached to the nose of the drilling machines] [N9906]

B23B49/02 . Boring templates or bushings
B23B49/02B . . [N: Bushings and their connection to the template]
B23B49/02C . . [N: Boring bushing carriers attached to the workpiece by glue, magnets, suction devices or the like]

B23B49/04 . Devices for boring or drilling centre holes in workpieces

B23B49/06 . Devices for drilling holes in brake bands or brake linings

B23B51/00 **Tools for drilling machines** [N: (for drilling wood B27G15/00; for drilling stone or stone-like materials, e.g. brick, concrete, glass B28D1/00; drill bits for earth or rock drilling E21B10/00)]

B23B51/00C . [N: Spade drills]

B23B51/00D . [N: Drills for enlarging a hole]

B23B51/00D1 . . [N: by tool swivelling]
B23B51/00D2 . . [N: by a tool-carrying eccentric]
B23B51/00D3 . . [N: by expanding or tilting the toolhead]

B23B51/00F . [N: Drill guiding devices]

B23B51/00G . [N: Centerdrills]

B23B51/00H . [N: Drills for making non-circular holes]

B23B51/00K . [N: Conical drills] [N9906]

B23B51/00L . [N: Stepped drills] [N9906]

B23B51/02 . Twist drills

B23B51/04 . Drills for trepanning
B23B51/04B . . [N: Drills with a tubular body (saw cylinders, e.g. having their cutting rim equipped with abrasive particles, for working stone or glass B28D1/04A)]
B23B51/04B1 . . . [N: with core-cutting-off devices]
B23B51/04B2 . . . [N: with lubricating or cooling equipment]
B23B51/04B3 . . . [N: with centering devices] [C9906]
B23B51/04B3B . . . . [N: with exchangeable cutting inserts, e.g. able to be clamped] [N9906]
B23B51/04B4 . . . [N: with core holding devices] [N9906]
B23B51/04B4B . . . . [N: with exchangeable cutting inserts, e.g. able to be clamped] [N9906]
B23B51/04B5 . . . [N: with ejecting devices] [N9906]
B23B51/04B5B . . . . [N: with exchangeable cutting inserts, e.g. able to be clamped] [N9906]
B23B51/04B6 . . . [N: with exchangeable cutting inserts, e.g. able to be clamped] [N9906]
B23B51/04B7 . . . [N: details about the connection between the driven shaft and the tubular cutting part] [N9906]
B23B51/04C . . [N: with exchangeable cutting inserts, e.g. able to be clamped (B23B51/04D1 takes precedence)] [C9906]
B23B51/04D . . [N: with lubricating or cooling equipment (B23B51/04B2 takes precedence)]
B23B51/04D1 . . . [N: with exchangeable cutting inserts, e.g. able to be clamped][C9906]
B23B51/05 . . for cutting discs from sheet

B23B51/06 . Drills with lubricating or cooling equipment [N: (B23B51/04B2 and B23B51/04D take precedence)]

B23B51/08 . Drills combined with tool parts or tools for performing additional working [N: (B23G5/20 takes precedence)]

B23B51/10 . Bits for countersinking
B23B51/10B . . [N: Deburring tools (B23B51/10D takes precedence)]
B23B51/10C . . [N: Back spot-facing or chamfering]
B23B51/10D . . [N: Deburring or chamfering tools for the ends of tubes or rods]
B23B51/10F . . [N: with stops]

B23B51/10G . . [N: Deburring or countersinking of radial holes]
B23B51/10H . . [N: with a toolholder moving along a direction oblique to the axis]
B23B51/10K . . [N: having a pilot]
B23B51/10M . . [N: having a centering twist drill]

B23B51/12 . Adapters for drills or chucks; Tapered sleeves
B23B51/12B . . [N: Conical reduction sleeves]
B23B51/12C . . [N: Tool elongating devices]
B23B51/14 . . Adapters for broken drills