SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

B23B **TURNING; BORING** (using an electrode which takes the place of a tool B23H, e.g. making holes B23H 9/14; working by laser beam B23K 26/00; arrangements for copying or controlling B23Q)

Subclass index

TURNING
- Methods 1/00
- Lathes
  - general-purpose lathes 3/00
  - semi-automatic or automatic lathes 7/00, 9/00, 11/00
  - for particular work 5/00
  - handling, adjusting 13/00, 15/00
  - component parts
    - headstocks, tailstocks, chucks 19/00, 23/00, 31/00
    - tools, or holders therefor 27/00, 29/00
    - other parts 17/00, 21/00, 33/00
  - accessories 25/00

BORING, DRILLING
- Methods 35/00, 37/00
- Machines
  - general-purpose machines 39/00
  - for particular work 41/00
  - hand-held machines 45/00
  - component parts 47/00, 49/00, 51/00

DEVICES FOR ATTACHMENT TO ANY MACHINE TOOL 43/00

Turning

1/00 Methods for turning or working essentially requiring the use of turning-machines; Use of auxiliary equipment in connection with such methods

3/00 General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines

3/02 • Small lathes, e.g. for toolmakers (specially designed for watchmakers G04D 3/00)

3/04 • Turning-machines in which the workpiece is rotated by means at a distance from the headstock

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)

3/08 • Turning-machines characterised by the use of faceplates

3/10 • • with the faceplate horizontal, i.e. vertical boring and turning machines

3/12 • • with the faceplate vertical, i.e. face lathes

3/14 • • Mountings or drives of faceplates

3/16 • Turret lathes for turning individually-chucked workpieces

3/18 • • with horizontal working-spindle

3/20 • • with vertical working-spindle

3/22 • Turning-machines or devices with rotary tool heads

3/24 • • the tools of which do not perform a radial movement; Rotary tool heads therefor

3/26 • • the tools of which perform a radial movement; Rotary tool heads thereof

3/28 • Turning-machines in which the feed is controlled by a copying device, i.e. copying lathes (features of copying devices B23Q 35/00)

3/30 • Turning-machines with two or more working-spindles, e.g. in fixed arrangement

3/32 • • for performing identical operations simultaneously on two or more workpieces

3/34 • Short turning-machines with one or multiple working-spindles attended from the end (B23B 3/12 takes precedence)

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)

5/00 Turning-machines or devices specially adapted for particular work; Accessories specially adapted therefor

5/02 • for turning hubs or brake drums (B23B 5/04 takes precedence)
5/04 • for reconditioning hubs or brake drums or axle spindles without removing same from the vehicle
5/06 • for turning valves or valve bodies
5/08 • for turning axles, bars, rods, tubes, rolls, i.e. shaft-turning lathes, roll lathes; Centreless turning
5/10 • • for turning pilgrim rolls
5/12 • • for peeling bars or tubes by making use of cutting bits arranged around the workpiece (making use of cutting bits arranged around the workpiece otherwise than by turning B23D 79/12) **[2]**
5/14 • Cutting-off lathes (shearing B23D)
5/16 • for bevelling, chamfering, or deburring the ends of bars or tubes
5/18 • for turning crankshafts, eccentrics, or cams, e.g. crankpin lathes
5/20 • • without removing same from the engine
5/22 • • Holding the workpiece in the machine, e.g. chucking devices
5/24 • for turning pistons or other workpieces to a slightly non-circular cross-section
5/26 • for simultaneously turning internal and external surfaces of a body
5/28 • for turning wheels or wheel sets or cranks thereon, i.e. wheel lathes
5/30 • • Arrangements providing for tool control by templates
5/32 • • for reconditioning wheel sets without removing same from the vehicle; Underfloor wheel lathes for railway vehicles
5/34 • • Holding the workpiece in the machine, e.g. chucking devices therefor; Drivers therefor
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
5/38 • • for turning conical surfaces inside or outside, e.g. taper pins
5/40 • • for turning spherical surfaces inside or outside
5/42 • • for turning relieving surfaces, i.e. relieving-lathes
5/44 • • for turning polygonal or other non-circular surfaces controlled by gear or guide mechanisms, i.e. eccentric lathes
5/46 • • for turning helical or spiral surfaces (thread cutting B23G)
5/48 • • • for cutting grooves, e.g. oil grooves of helicoidal shape

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

7/02 • Automatic or semi-automatic machines for turning of stock
7/04 • • Turret machines
7/06 • • with sliding headstock
7/08 • • with the working-spindle vertical
7/10 • • Accessories, e.g. guards
7/12 • Automatic or semi-automatic machines for turning of workpieces
7/14 • • with the working-spindle horizontal
7/16 • • with the working-spindle vertical

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 pre-determined positions; Equipment therefor (equipment applicable to single-spindle machines B23B 7/00)

9/02 • Automatic or semi-automatic machines for turning of stock
9/04 • • with the working-spindles horizontal
9/06 • • with the working-spindles vertical
9/08 • Automatic or semi-automatic machines for turning of workpieces
9/10 • • with the working-spindles horizontal
9/12 • • with the working-spindles vertical

11/00 Automatic or semi-automatic turning-machines incorporating equipment for performing other working procedures, e.g. slotting, milling, rolling

13/00 Arrangements for automatically conveying, chucking or guiding stock for turning machines

13/02 • for turning-machines with a single working-spindle
13/04 • for turning-machines with a plurality of working-spindles
13/06 • Arrangements for switching-off the drive of turning-machines after the stock has been completely machined
13/08 • Arrangements for reducing vibrations in feeding-passages or for damping noise (damping noise in general G10K)
13/10 • with magazines for stock
13/12 • Accessories, e.g. stops, grippers

15/00 Arrangements for conveying, loading, adjusting, reversing, chucking, or discharging workpieces specially designed for automatic or semi-automatic turning-machines

<u>Components or accessories particularly for turning machines</u>

17/00 Lathe beds (foundation frames, carriage guides as such B23Q 1/00)

19/00 Headstocks; Equivalent parts of any machine tools

19/02 • Working-spindles; Features relating thereto, e.g. supporting arrangements (B23B 13/00 takes precedence)

21/00 Lathe carriages; Cross-slides; Tool posts (tool holders B23B 29/00)**; Similar parts of any machine tools**

23/00 Tailstocks; Centres

23/02 • Dead centres
23/04 • Live centres

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

25/02 • Arrangements for chip-breaking in turning-machines (on cutting tools B23B 27/22)
25/04 • Safety guards specially designed for turning-machines (in general F16P)
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)

27/00 **Tools for turning or boring machines** (for drilling machines B23B 51/00)**; Tools of a similar kind in general; Accessories therefor**

27/02 • Cutting tools with straight main part and cutting edge at an angle (B23B 27/04-B23B 27/08 take precedence)
27/04 • Cutting-off tools (B23B 27/08 takes precedence)
27/06 • Profile cutting tools, i.e. forming-tools
27/08 • Cutting tools with blade- or disc-like main parts
27/10 • Cutting tools with special provision for cooling
27/12 • • with a continuously-rotated circular cutting edge; Holders therefor
27/14 • Cutting tools of which the bits or tips are of special material
27/16 • • with exchangeable cutting bits, e.g. able to be clamped
27/18 • • with cutting bits or tips rigidly mounted, e.g. by brazing
27/20 • • with diamond bits
27/22 • Cutting tools with chip-breaking equipment
27/24 • Knurling tools

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

29/02 • Boring bars
29/03 • Boring heads
29/034 • • with tools moving radially, e.g. for making chamfers or undercuttings **[4]**
29/04 • Tool holders for a single cutting tool
29/06 • • Tool holders equipped with longitudinally-arranged grooves for setting the cutting tool
29/08 • • Tool holders equipped with grooves arranged crosswise to the longitudinal direction for setting the cutting tool
29/10 • • • with adjustable counterbase for the cutting tool
29/12 • • Special arrangements on tool holders
29/14 • • • affording a yielding support of the cutting tool, e.g. by spring clamping
29/16 • • • for supporting the workpiece in a backrest
29/18 • • • for retracting the cutting tool
29/20 • • • for placing same by shanks in sleeves of a turret
29/22 • • • for tool adjustment by means of shims or spacers
29/24 • Tool holders for a plurality of cutting tools, e.g. turrets
29/26 • • Tool holders in fixed position
29/28 • • Turrets manually adjustable about a vertical pivot
29/30 • • Turrets manually adjustable about a horizontal pivot
29/32 • • Turrets adjustable by power drive, i.e. turret heads
29/34 • • Turrets equipped with triggers for releasing the cutting tools

31/00 **Chucks; Expansion mandrels; Adaptations thereof for remote control** (devices for securing work or tools to spindles in general B23Q 3/12; rotary devices holding by magnetic or electrical force acting directly on work B23Q 3/152)

31/02 • Chucks
31/06 • • Features relating to the removal of tools or work; Accessories therefor
31/07 • • • Ejector wedges **[5]**
31/08 • • holding tools or work yieldably
31/10 • • characterised by the retaining or gripping devices or their immediate operating means

Note(s)

Group B23B 31/12 takes precedence over groups B23B 31/103-B23B 31/117.

31/103 • • • Retention by pivotal elements, e.g. catches, pawls **[5]**
31/107 • • • Retention by laterally-acting detents, e.g. pins, screws, wedges; Retention by loose elements, e.g. balls **[5]**
31/11 • • • Retention by threaded connection **[5]**
31/113 • • • Retention by bayonet connection **[5]**
31/117 • • • Retention by friction only, e.g. using springs, resilient sleeves, tapers **[5]**
31/12 • • • Chucks with simultaneously-acting jaws, whether or not also individually adjustable
31/14 • • • • involving the use of centrifugal force
31/16 • • • • moving radially
31/163 • • • • • actuated by one or more spiral grooves **[5]**
31/165 • • • • • actuated by screw-and-nut mechanisms **[5]**
31/167 • • • • • actuated by oblique racks **[5]**
31/169 • • • • • actuated by toothed gearing (B23B 31/167 takes precedence) **[5]**
31/171 • • • • • actuated by a cam surface in a radial plane **[5]**
31/173 • • • • • actuated by coaxial conical surfaces (B23B 31/177 takes precedence) **[5]**
31/175 • • • • • actuated by levers moved by a coaxial control rod **[5]**
31/177 • • • • • actuated by the oblique surfaces of a coaxial control rod (B23B 31/167 takes precedence) **[5]**
31/18 • • • • pivotally movable in planes containing the axis of the chuck
31/19 • • • • moving parallel to the axis of the chuck
31/20 • • • • Longitudinally-split sleeves, e.g. collet chucks
31/22 • • • • Jaws in the form of balls
31/24 • • characterised by features relating primarily to remote control of the gripping means
31/26 • • • using mechanical transmission through the working-spindle
31/28 • • • using electric or magnetic means in the chuck
31/30 • • • using fluid-pressure means in the chuck
31/32 • • with jaws carried by diaphragm
31/34 • • with means enabling the workpiece to be reversed or tilted
31/36 • • with means for adjusting the chuck with respect to the working-spindle
31/38 • • with overload clutches
31/39 • • Jaw changers **[5]**
31/40 • Expansion mandrels
31/42 • • characterised by features relating primarily to remote control of the gripping means

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

Boring; Drilling [3]

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**

37/00 **Boring by making use of vibrations of ultrasonic frequency** (working materials by subjecting the grinding tools or the abrading medium to vibration, e.g. grinding with ultrasonic frequency, B24B 1/04)

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

39/02 • Boring machines; Combined horizontal boring and milling machines
39/04 • Co-ordinate boring or drilling machines; Machines for making holes without previous marking
39/06 • • Equipment for positioning work
39/08 • • Devices for programme control
39/10 • characterised by the drive, e.g. by fluid-pressure drive, pneumatic power drive
39/12 • Radial drilling machines
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
39/16 • Drilling machines with a plurality of working-spindles; Drilling automatons
39/18 • • Setting work or tool carrier along a straight index line
39/20 • • Setting work or tool carrier along a circular index line; Turret head drilling machines
39/22 • • with working-spindles in opposite headstocks
39/24 • • designed for programme control
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)
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)

41/00 **Boring or drilling machines or devices specially adapted for particular work; Accessories specially adapted therefor**

41/02 • for boring deep holes; Trepanning, e.g. of gun or rifle barrels
41/04 • for boring polygonal or other non-circular holes
41/06 • for boring conical holes
41/08 • for boring, drilling, or tapping holes in tubes under fluid or gas pressure (sealing features or operations, combined with placing branch parts F16L 41/04)
41/10 • for boring holes in steam boilers
41/12 • for forming working surfaces of cylinders, of bearings, e.g. in heads of driving rods, or of other engine parts
41/14 • for very small holes
41/16 • for boring holes with high-quality surface

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)

43/02 • to the tailstock of a lathe

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) **[4]**

45/02 • driven by electric power
45/04 • driven by fluid-pressure or pneumatic power
45/06 • driven by man-power
45/08 • • for drilling rails or profiled stock
45/10 • • by using a fiddle bow or a belt
45/12 • • by using a ratchet brace
45/14 • Means for holding or guiding the drilling device or for securing it to the work (B23B 41/08 takes precedence); Thrust stands
45/16 • with superimposed percussive action (portable percussive machines with superimposed rotation B25D 16/00) **[3]**

Components or accessories for boring or drilling machines

47/00 **Constructional features of components specially designed for boring or drilling machines; Accessories therefor** (working-spindles, bearing sleeves therefor B23B 19/02; for machine tools in general B23Q)

47/02 • Drives; Gearings (B23B 39/10 takes precedence)
47/04 • • for rotating the working-spindle
47/06 • • • driven essentially by electrical means
47/08 • • • driven essentially by fluid-pressure or pneumatic power
47/10 • • • • equipped with turbines or other rotating machines
47/12 • • • • equipped with oscillating pistons
47/14 • • • Change-speed gearings; Reversing gearings
47/16 • • • Belt or chain drives
47/18 • • for feeding or retracting tool or work
47/20 • • • actuated essentially by electric power
47/22 • • • actuated essentially by fluid-pressure or pneumatic power
47/24 • • • Stops or feed interruption owing to fracture or overload of the boring or drilling tool
47/26 • Liftable or lowerable drill heads or headstocks; Balancing arrangements therefor
47/28 • Drill jigs for workpieces (equipment for setting or guiding the drill B23B 49/00)
47/30 • Additional gear with one or more working-spindles attachable to the main working-spindle and mounting the additional gear
47/32 • Arrangements for preventing the running-out of drills or fracture of drills when getting through
47/34 • Arrangements for removing chips out of the holes made; Chip-breaking arrangements attached to the tool

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

49/02 • Boring templates or bushings
49/04 • Devices for boring or drilling centre holes in workpieces
49/06 • Devices for drilling holes in brake bands or brake linings

51/00 **Tools for drilling machines**

51/02 • Twist drills
51/04 • for trepanning
51/05 • • for cutting discs from sheet **[4]**
51/06 • Drills with lubricating or cooling equipment
51/08 • Drills combined with tool parts or tools for performing additional working
51/10 • Bits for countersinking
51/12 • Adapters for drills or chucks; Tapered sleeves
51/14 • • Adapters for broken drills