

ECLA EUROPEAN CLASSIFICATION

B23Q

DETAILS, COMPONENTS, OR ACCESSORIES FOR MACHINE TOOLS, e.g. ARRANGEMENTS FOR COPYING OR CONTROLLING (tools of the kind used in lathes or boring machines [B23B27/00](#)); MACHINE TOOLS IN GENERAL CHARACTERISED BY THE CONSTRUCTION OF PARTICULAR DETAILS OR COMPONENTS; COMBINATIONS OR ASSOCIATIONS OF METAL-WORKING MACHINES, NOT DIRECTED TO A PARTICULAR RESULT [[C9609](#)]

Notes

1. In this subclass, groups designating parts of machine tools cover machine tools characterised by constructional features of such parts.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
 - "controlling" means influencing a variable in any way, e.g. changing its direction or its value (including changing it to or from zero), maintaining it constant, limiting its range of variation;
 - "regulation" means maintaining a variable automatically at a desired value or within a desired range of values. The desired value or range may be fixed, or manually varied, or may vary with time according to a predetermined "programme" or according to variation of another variable. Regulation is a form of control;
 - "automatic control" is often used in the art as a synonym for regulation.
3. Attention is drawn to the Notes following the title of class B23.

B23Q1/00

Members which are comprised in the general build-up of a form of machine, particularly relatively large fixed members ([B23Q37/00](#) takes precedence)

B23Q1/00B

- [N: Energy-transferring means or control lines for movable machine parts; Control panels or boxes; Control parts (control handles for driving or feeding mechanisms [B23Q5/54](#))] [M1107]

B23Q1/00B2

- . [N: comprising hydraulic means]

B23Q1/00B2B

- . . [N: between moving parts between which an uninterrupted energy-transfer connection is maintained]

B23Q1/00B2B2

- . . . [N: one of those parts being a tool]

B23Q1/00B4

- . [N: Control panels or boxes] [N1204]

B23Q1/00C

- [N: Means for adjusting the position of a machine tool with respect to its supporting surface ([B23Q1/26C](#) takes precedence)] [C9601]

B23Q1/00D

- [N: Connecting non-slidable parts of machine tools to each other]

B23Q1/00D1

- . [N: using a clamping opening for receiving an insertion bolt or nipple] [N1204]

B23Q1/00D3

- . [N: using an expanding clamping member insertable in a receiving hole] [N1204]

- B23Q1/00D3A . . . [N: the receiving hole being cylindrical or conical] [N1204]
- B23Q1/01 . Frames, beds, pillars or like members; Arrangement of ways [N9601]
- B23Q1/01A . . [N: Portals] [N9601]
- B23Q1/01B . . [N: Frames, beds, pillars] [N9601] [M1107]
- B23Q1/01D . . [N: Arrangements of ways] [N9601]
- B23Q1/03 . Stationary work or tool supports ([B23Q1/70](#) takes precedence; auxiliary tables [B23Q1/74](#); tailstocks [B23B23/00](#)) [N9601]
- B23Q1/03B . . [N: characterised by properties of the support surface] [N9601] [M1107]
- B23Q1/03D . . [N: with an array of longitudinally movable rods defining a reconfigurable support surface] [N1107]
- B23Q1/03F . . [N: comprising series of support elements whose relative distance is adjustable] [N1107]
- B23Q1/25 . Movable or adjustable work or tool supports [N9601]
- B23Q1/26 . . characterised by constructional features relating to the co-operation of relatively movable members; Means for preventing relative movement of such members [N: (bearings for linearly moving parts [F16C29/00](#))] [C9601]
- B23Q1/26C . . . [N: with means to adjust the distance between the relatively slidable members (if the adjusting means depends on the position of the slidable members [B23Q1/30](#))] [C0607]
- B23Q1/26C2 [N: between rotating members]
- B23Q1/26D [N: with means to prevent skewness between the relatively slidable members]
- B23Q1/28 . . . Means for securing sliding members in any desired position
- B23Q1/28B [N: co-operating with means to adjust the distance between the relatively slidable members]
- B23Q1/28C [N: for securing two or more members simultaneously or selectively]
- B23Q1/28D [N: using a hydraulically controlled membrane acting directly upon a sliding member]
- B23Q1/30 . . . controlled in conjunction with the feed mechanism
- B23Q1/32 . . . Relative movement obtained by co-operating spherical surfaces, e.g. ball-and-socket joints [N9601]
- B23Q1/34 . . . Relative movement obtained by use of deformable elements, e.g. piezo-electric, magnetostrictive, elastic or thermally-dilatable elements (sensitive elements capable of producing movement or displacement for purposes not limited to measurement [G12B1/00](#)) [N9601]
- B23Q1/36 Springs [N9601]
- B23Q1/38 . . . using fluid bearings or fluid cushion supports [N9601]
- B23Q1/38B [N: in which the thickness of the fluid-layer is adjustable] [N9601]
- B23Q1/40 . . . using ball, roller or wheel arrangements [N9601]
- B23Q1/42 . . . using T-, V-, dovetail-section or like guides ([B23Q1/40](#) takes precedence) [N9601]

Notes

[N9601]

1. In groups [B23Q1/44](#) to [B23Q1/62](#), the following expressions are used with the meaning indicated:- "sliding pair" means a pair consisting of two

elements operating in such a way that only straight line movement between both elements is possible;- "rotating pair" means a pair consisting of two elements operating in such a way that only rotary movement between both elements is possible;- "screw pair" means a pair consisting of two elements operating in such a way as to produce simultaneous rotation and axial translation between both elements.

2. In groups [B23Q1/44](#) to [B23Q1/62](#), where more than one pair of elements is provided on the same axis for the same kind of movement, the pairs are regarded as a single pair for the purposes of classification.

B23Q1/44	. .	using particular mechanisms (B23Q1/26 takes precedence) [N9601]
B23Q1/44A	. . .	[N: using a first carriage for a smaller workspace mounted on a second carriage for a larger workspace, both carriages moving on the same axes] [N1204]
B23Q1/46	. . .	with screw pairs [N9601]
B23Q1/48	. . .	with sliding pairs and rotating pairs (B23Q1/46 takes precedence) [N9601]
B23Q1/48A	. . . .	[N: a single rotating pair followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/48A1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/48A3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/48A5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/48A7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/48C	. . . . .	[N: a single rotating pair followed parallelly by a single sliding pair] [N9601] [C1107]
B23Q1/48C1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [C1107]
B23Q1/48C3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/48C5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/48C7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/48E	. . . . .	[N: a single sliding pair followed perpendicularly by a single rotating pair] [N9601] [C1107]
B23Q1/48E1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/48E3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/48E5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/48E7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/48G	. . . . .	[N: a single sliding pair followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/48G1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/48G3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/48G5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/48G7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/50	. . .	with rotating pairs only, [N: the rotating pairs being the first two elements of the mechanism] [N9601]
B23Q1/52	. . . . .	a single rotating pair [N9601]
B23Q1/52A	. . . . .	[N: which is perpendicular to the working surface] [N0501]
B23Q1/52B	. . . . .	[N: which is parallel to the working surface] [N0501]
B23Q1/52C	. . . . .	[N: with a ring or tube in which a workpiece is fixed coaxially to the

		degree of freedom] [N0501]
B23Q1/54	. . . .	two rotating pairs only [N9601]
B23Q1/54A	. . . . .	[N: a single rotating pair followed perpendicularly by a single rotating pair (B23Q1/54B takes precedence)] [N9601] [M1107]
B23Q1/54A1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/54A3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/54A5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/54A7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/54A9	. . . . .	[N: and in which the degree of freedom, which belongs to the working surface, is perpendicular to this surface] [N0501]
B23Q1/54A11	. . . . .	[N: and in which the degree of freedom, which belongs to the working surface, is parallel to this surface] [N0501]
B23Q1/54B	. . . . .	[N: comprising spherical surfaces] [N9601]
B23Q1/54B1	. . . . .	[N: with one supplementary rotating pair] [N9601]
B23Q1/54B3	. . . . .	[N: with one supplementary sliding pair] [N9601]
B23Q1/54C	. . . . .	[N: a single rotating pair followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/54C1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/54C3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/54C5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/54C7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/56	. . .	with sliding pairs only, [N: the sliding pairs being the first two elements of the mechanism] [N9601]
B23Q1/58	. . . . .	a single sliding pair [N9601]
B23Q1/58A	. . . . .	[N: perpendicular to the working surface] [N0501]
B23Q1/60	. . . . .	two sliding pairs only, [N: the sliding pairs being the first two elements of the mechanism] [N9601]
B23Q1/60A	. . . . .	[N: a single sliding pair followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/60A1	. . . . .	[N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/60A3	. . . . .	[N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/60A5	. . . . .	[N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/60A7	. . . . .	[N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/62	. . . . .	with perpendicular axes, e.g. cross-slides [N9601]
B23Q1/62A	. . . . .	[N: a single sliding pair followed perpendicularly by a single sliding pair] [N9601] [C0812] [M1107]
B23Q1/62A1	. . . . .	{7 dots} [N: followed perpendicularly by a single rotating pair] [N9601] [M1107]
B23Q1/62A3	. . . . .	{7 dots} [N: followed parallelly by a single rotating pair] [N9601] [M1107]
B23Q1/62A5	. . . . .	{7 dots} [N: followed perpendicularly by a single sliding pair] [N9601] [M1107]
B23Q1/62A7	. . . . .	{7 dots} [N: followed parallelly by a single sliding pair] [N9601] [M1107]
B23Q1/64	. .	characterised by the purpose of the movement (indexing equipment B23Q16/02) [N9601]

- B23Q1/66 . . . Worktables interchangeably movable into operating positions [N9601]
- B23Q1/68 . . . for withdrawing tool or work during reverse movement [N9601]
- B23Q1/70 . Stationary or movable members for carrying working-spindles for attachment of tools or work ([N: [B23Q1/01](#) takes precedence; designed to be moved by using particular mechanisms [B23Q1/44](#)]) [N9601] [C0910]
- B23Q1/70C . . [N: Spindle extensions] [N9601]
- B23Q1/70D . . [N: Movable members, e.g. swinging arms] [N9601]
- B23Q1/72 . Auxiliary arrangements; Interconnections between auxiliary tables and movable machine elements [N: (independent of machine tool [B23Q3/10G](#))] [N9601]
- B23Q1/74 . . Auxiliary tables [N9601]
- B23Q1/76 . . Steadies; Rests [N: ([B23B13/12D](#) takes precedence; steadies combined with cutting tool holders [B23B29/16](#))] [N9601] [M1107]
- B23Q1/76B . . . [N: Rotating steadies or rests] [N9601]
- B23Q1/76C . . . [N: Steadies or rests moving together with the tool support] [N9601]
- B23Q3/00** **Devices holding, supporting, or positioning work or tools, of a kind normally removable from the machine** (work-tables or other parts, e.g. faceplates, normally not incorporating means for securing work [B23Q1/00](#); automatic position control [B23Q15/00](#); rotary tool heads for turning-machines [B23B3/24](#), [B23B3/26](#); non-driven tool holders [B23B29/00](#); general features of turrets [B23B29/24](#); tools or bench devices for fastening, connecting, disengaging or holding [B25B](#)) [C9601]
- B23Q3/00B . [N: Means to press a workpiece against a guide]
- B23Q3/00C . [N: Guides for workpieces]
- B23Q3/00C2 . . [N: provided with measuring means allowing the positioning of the guides]
- B23Q3/02 . for mounting on a work-table, tool-slide, or analogous part ([B23Q3/15](#) takes precedence)
- B23Q3/04 . . adjustable in inclination
- B23Q3/06 . . Work-clamping means [C9601]
- B23Q3/06C . . . [N: adapted for holding a plurality of workpieces] [M1107]
- B23Q3/06D . . . [N: adapted for holding workpieces having a special form or being made from a special material] [M1107]
- [N: **WARNING** [N1107]
Subgroups [B23Q3/06D1](#) - [B23Q3/06D5](#) are not complete, due to a reorganisation in progress; see also [B23Q3/06D](#)]
- B23Q3/06D1 [N: for holding turbine blades] [N1107]
- B23Q3/06D3 [N: for holding elongated workpieces, e.g. pipes, bars or profiles] [N1107]
- B23Q3/06D5 [N: for holding workpieces being specially deformable, e.g. made from thin-walled or elastic material] [N1107]
- B23Q3/06F . . . [N: Bench vices]
- B23Q3/06K . . . [N: Blocks with collet chucks]
- B23Q3/06K2 [N: fluid-operated]
- B23Q3/06L . . . [N: for pressing workpieces against a work-table] [M1107]

- B23Q3/08 . . . other than mechanically-actuated [N: ([B23Q3/06C](#), [B23Q3/06F](#), and [B23Q3/06K](#) take precedence)]
- B23Q3/08B [N: hydraulically actuated]
- B23Q3/08D [N: using adhesive means] [N1107]
- B23Q3/08F [N: using a solidifying liquid, e.g. with freezing, setting or hardening means] [N1107]
- B23Q3/08H [N: using vacuum means] [N1204]
- B23Q3/10 . . Auxiliary devices, e.g. bolsters, extension members [N: (devices for holding usually unilaterally-held tools at a second side, devices supporting a workpiece against cutting forces [B23Q1/76](#))] [C9601] [M1107]
- B23Q3/10B . . . [N: for supporting a workpiece during its transport to or from a tool holder]
- B23Q3/10C . . . [N: for fixing elements in slots]
- B23Q3/10D . . . [N: Constructional elements used for constructing work holders]
- B23Q3/10F . . . [N: V-blocks]
- B23Q3/10G . . . [N: Auxiliary supporting devices independent of the machine tool]
- B23Q3/10H . . . [N: extendable members, e.g. extension members]
- B23Q3/10H1 [N: with positive adjustment means]
- B23Q3/10H2 [N: with non-positive adjustment means]

- B23Q3/12 . for securing to a spindle in general ([B23Q3/152](#) takes precedence; chucks [B23B31/02](#))
- B23Q3/14 . . Mandrels in general (expansion mandrels [B23B31/40](#))

- B23Q3/15 . Devices for holding work using magnetic or electric force acting directly on the work
- B23Q3/152 . . Rotary devices
- B23Q3/154 . . Stationary devices
- B23Q3/154B . . . [N: using electromagnets]
- B23Q3/154C . . . [N: using permanent magnets]

- B23Q3/155 . Arrangements for automatic insertion or removal of tools, [N: e.g. combined with manual handling ([B23Q7/04E](#) takes precedence)]
- B23Q3/155B . . [N: the tool being inserted in a tool holder directly from a storage device (without transfer device)]
- B23Q3/155C . . [N: the tool being taken from a storage device and transferred to a tool holder by means of transfer devices]
- B23Q3/155D . . [N: parts of devices for automatically inserting or removing tools]
- B23Q3/155D2 . . . [N: Storage devices; Drive mechanisms therefor]
- B23Q3/155D2B [N: combined with manual tool transfers]
- B23Q3/155D3 . . . [N: Transfer mechanisms and their drive mechanism]
- B23Q3/155D4 . . . [N: Devices for recognizing tools in a storage device (coding devices)]
- B23Q3/155D5 . . . [N: Tool holder and tensioning device therefor (also bringing the spindle in a given angular position [B23Q5/20](#), [B23C5/26](#))]
- B23Q3/155N . . [N: of non-rotary tools (in combination with rotary tools: [B23Q3/155B](#), [B23Q3/155C](#))]
- B23Q3/155N2 . . . [N: the tool being inserted in a tool holder directly from a storage device, i.e. without using transfer devices]
- B23Q3/155N3 . . . [N: the tool being taken from a storage device and transferred to a tool holder

- by means of transfer devices]
- B23Q3/157 . . of rotary tools [N: (in combination with non-rotary tools [B23Q3/155B](#), [B23Q3/155C](#))]
- B23Q3/157B . . . [N: a single tool being inserted in a spindle directly from a storage device, i.e. without using transfer devices ([B23Q3/157M](#) takes precedence)]
- B23Q3/157C . . . [N: a transfer device taking a single tool from a storage device and inserting it in a spindle ([B23Q3/157N](#) takes precedence)]
- B23Q3/157C2 [N: the storage device comprising rotating or circulating storage means, e.g. discs, tables, drums, chains, belts]
- B23Q3/157C2B [N: the storage means rotating or circulating in a plane parallel to the axis of the spindle]
- B23Q3/157C2B2 [N: the axis of the stored tools being arranged in the rotating or circulating plane of the storage means]
- B23Q3/157C2B3 [N: the axis of the stored tools being arranged perpendicularly to the rotating or circulating plane of the storage means]
- B23Q3/157C2B3B {7 dots} [N: the storage means comprising pivotable tool storage elements]
- B23Q3/157C2C [N: the storage means rotating or circulating in a plane perpendicular to the axis of the spindle]
- B23Q3/157C2C2 [N: the axis of the stored tools being arranged in the rotating or circulating plane of the storage means]
- B23Q3/157C2C3 [N: the axis of the stored tools being arranged perpendicularly to the rotating or circulating plane of the storage means]
- B23Q3/157D . . . [N: a transfer device taking the tool from a storage device and passing it on to other transfer devices, which insert it in a spindle]
- B23Q3/157E . . . [N: for tool transfer in a machine tool with a horizontal and a vertical spindle; for tool transfer in a machine tool with a spindle having variable orientation]
- B23Q3/157M . . . [N: a plurality of tools being inserted simultaneously in a plurality of spindles directly from a storage device, i.e. without using transfer devices]
- B23Q3/157N . . . [N: a transfer device simultaneously taking a plurality of tools and inserting them simultaneously in a plurality of spindles]

- B23Q3/16 . controlled in conjunction with the operation of the tool

- B23Q3/18 . for positioning only
- B23Q3/18B . . [N: Centering devices]
- B23Q3/18C . . [N: Aligning devices]

- B23Q5/00** **Driving or feeding mechanisms; Control arrangements therefor** (automatic control [B23Q15/00](#); copying [B23Q33/00](#), [B23Q35/00](#); specially adapted for boring or drilling machines [B23B39/10](#), [B23B47/02](#); [N: numerical programme-control of machine tools [G05B19/18](#)]) [C9609]

- B23Q5/02 . Driving main working members
- B23Q5/027 . . reciprocating members
- B23Q5/033 . . . driven essentially by fluid pressure
- B23Q5/04 . . rotary shafts, e.g. working-spindles
- B23Q5/04B . . . [N: Spindle-reversing devices]

- B23Q5/04D . . . [N: Accessories for spindle drives]
- B23Q5/04D2 [N: Angle drives]
- B23Q5/04D4 [N: Offset spindle drives]
- B23Q5/04D6 [N: Speed-changing devices]
- B23Q5/06 . . . driven essentially by fluid pressure or pneumatic power
- B23Q5/08 electrically controlled
- B23Q5/10 . . . driven essentially by electrical means
- B23Q5/12 . . . Mechanical drives with means for varying the speed ratio
- B23Q5/14 step-by-step
- B23Q5/14B [N: mechanically-operated]
- B23Q5/14C [N: fluid-operated]
- B23Q5/14D [N: electrically-operated]
- B23Q5/16 infinitely-variable
- B23Q5/16B [N: mechanically-operated]
- B23Q5/16C [N: fluid-operated]
- B23Q5/16D [N: electrically-operated]
- B23Q5/18 Devices for preselecting speed of working-spindle
- B23Q5/20 . . . Adjusting or stopping working-spindles in a predetermined position

- B23Q5/22 . Feeding members carrying tools or work
- B23Q5/22M . . [N: not mechanically connected to the main drive, e.g. with separate motors
(connected to main drive through servomotors [B23Q5/36](#))] [N0904]

- B23Q5/26 . . Fluid-pressure drives
- B23Q5/26B . . . [N: for spindles]
- B23Q5/26B1 [N: with means to control the feed rate by controlling the fluid flow]
- B23Q5/26B1B [N: this regulation depending upon the position of the tools or work]
- B23Q5/26C [N: with means to control the feed rate by controlling the fluid flow]
- B23Q5/26C1 [N: depending upon the position of the tool or work]
- B23Q5/28 . . Electric drives
- B23Q5/32 . . Feeding working-spindles (feeding working-spindle supports [B23Q5/34](#))
- B23Q5/32B . . . [N: cam-operated]
- B23Q5/32C . . . [N: screw-operated]
- B23Q5/34 . . Feeding other members supporting tools or work, e.g. saddles, tool-slides, through
mechanical transmission
- B23Q5/34B . . . [N: cam-operated]
- B23Q5/34B2 [N: Cam followers (see also [B23Q35/26](#))]
- B23Q5/34B4 [N: Cams (see also [B23Q35/42](#))]
- B23Q5/34B6 [N: Cam assembly (see also [B23Q35/46](#))]
- B23Q5/34B8 [N: controlled in conjunction with tool or work indexing means]
- B23Q5/34C [N: by means of clutches]
- B23Q5/36 . . . in which a servomotor forms an essential element
- B23Q5/38 . . . feeding continuously
- B23Q5/38B [N: using a gear and rack mechanism or a friction wheel co-operating with a

- rail]
- B23Q5/40 by feed shaft, e.g. lead screw
- B23Q5/40B [N: in which screw or nut can both be driven]
- B23Q5/40C [N: Screw bearings therefor]
- B23Q5/40D [N: with means for meshing screw and nut]
- B23Q5/40F [N: Nut bearings therefor]
- B23Q5/42 Mechanism associated with headstock
- B23Q5/44 Mechanism associated with the moving member
- B23Q5/46 with variable speed ratio
- B23Q5/48 by use of toothed gears
- B23Q5/50 feeding step-by-step
- B23Q5/52 . . . Limiting feed movement [N: ([B23Q11/04](#) takes precedence)]

- B23Q5/54 . . Arrangements or details not restricted to group [B23Q5/02](#) or group [B23Q5/22](#) respectively, [N: e.g. control handles] [M1107]
- B23Q5/56 . . Preventing backlash
- B23Q5/58 . . Safety devices [N: ([protecting the operator B23Q11/00G6](#))] [M1107]
- B23Q5/58B . . . [N: Preventing the misuse of accessories, e.g. chuck keys]

- B23Q7/00** **Arrangements for handling work specially combined with or arranged in, or specially adapted for use in connection with, machine tools, e.g. for conveying, loading, positioning, discharging, sorting (incorporated in working-spindles [B23B13/00](#)) [C0910]**

- B23Q7/00C . . [N: Lateral transport of long workpieces]
- B23Q7/00F . . [N: Screw or rotary spiral conveyers ([B23Q7/14K](#) takes precedence)] [C9609]
- B23Q7/00H . . [N: Cyclically moving conveyers ([B23Q7/14K](#) takes precedence)] [C9609]
- B23Q7/00K . . [N: Lifting devices]
- B23Q7/00L . . [N: Ejectors]
- B23Q7/00N . . [N: Flying working devices]
- B23Q7/00P . . [N: Catching devices ([B23Q7/12](#) takes precedence)]
- B23Q7/02 . . by means of drums or rotating tables or discs
- B23Q7/03 . . by means of endless chain conveyers ([N:[B23Q7/14K5](#),] [B23Q7/16](#) take precedence)
- B23Q7/03B . . . [N: on which work holders are fixed]

- B23Q7/04 . . by means of grippers [N: ([B23Q7/14K8](#) takes precedence)]
- B23Q7/04B . . . [N: step by step]
- B23Q7/04B1 [N: for the axial transport of long workpieces ([B23B13/02B1](#) takes precedence)]
- B23Q7/04C . . . [N: Construction of the grippers ([B23Q7/04M](#) takes precedence)]

- B23Q7/04D . . [N: using a tool holder as a work-transporting gripper]
- B23Q7/04E . . [N: Handling workpieces or tools]
- B23Q7/04F . . [N: the gripper supporting the workpiece during machining]
- B23Q7/04M . . [N: Multiple gripper units]

- B23Q7/05 . by means of roller-ways ([N:[B23Q7/14K6B](#),] [B23Q7/16](#) take precedence)
- B23Q7/05B . . [N: some of the rollers being driven]

- B23Q7/06 . by means of pushers [N: ([B23Q7/14K5C](#), [B23Q7/14K7C](#), [B23B13/02](#), [B23B13/12](#) take precedence)]

- B23Q7/08 . by means of slides or chutes

- B23Q7/10 . by means of magazines
- B23Q7/10B . . [N: for flat material]
- B23Q7/10C . . [N: with means to deliver a certain quantity ([B23Q7/10B](#) takes precedence)]

- B23Q7/12 . Sorting arrangements

- B23Q7/14 . co-ordinated in production lines
- B23Q7/14B . . [N: with a series disposition of similar working devices]
- B23Q7/14C . . [N: with a series disposition of different working devices and with the axial transport for long workpieces of which a plurality of final products are made]
- B23Q7/14D . . [N: with a series disposition of working devices not corresponding with the sequence of the working]
- B23Q7/14F . . [N: with a parallel disposition of working devices]
- B23Q7/14K . . [N: with work holders not rigidly fixed to the transport devices ([B23Q7/00K](#), [B23Q7/03B](#) take precedence)]
- B23Q7/14K2 . . . [N: Work holder changers ([B23Q7/14K4](#) takes precedence)]
- B23Q7/14K3 . . . [N: using self-propelled work holders]
- B23Q7/14K4 . . . [N: using carts carrying work holders]
- B23Q7/14K5 . . . [N: using endless conveyers]
- B23Q7/14K5B [N: comprising load-supporting surfaces]
- B23Q7/14K5C [N: comprising an impeller or a series of impellers]
- B23Q7/14K6 . . . [N: using rotary driving means]
- B23Q7/14K6B [N: comprising rollers or cogwheels, or pinions or the like]
- B23Q7/14K6C [N: comprising screw conveyers]
- B23Q7/14K7 . . . [N: using a conveyer comprising cyclically-moving means]
- B23Q7/14K7B [N: with carrier means]
- B23Q7/14K7C [N: with impeller means]
- B23Q7/14K8 . . . [N: using grippers]

- B23Q7/16 . Loading work on to conveyers; Arranging work on conveyers, e.g. varying spacing between individual workpieces
- B23Q7/16B . . [N: Turning devices]
- B23Q7/18 . . Orientating work on conveyers

- B23Q9/00** **Arrangements for supporting or guiding portable metal-working machines or apparatus (for tapping pipes [B23B41/08](#) [N: [F16L41/04](#)]; specially designed for drilling [B23B45/14](#) [N: [B25H1/00C](#)]) [M1107]**
- B23Q9/00B** . [N: Portable machines comprising means for their guidance or support directly on the workpiece]
- B23Q9/00C** . [N: Portable machines provided with or cooperating with guide means supported directly by the workpiece during action]
- B23Q9/00C2** . . [N: the tool being guided in a circular path]
- B23Q9/00C4** . . [N: the guide means being fixed only on the machine]
- B23Q9/00C4B** . . . [N: and being capable of guiding the tool in a circular path]
- B23Q9/00C5** . . [N: the guide means being fixed only on the workpiece]
- B23Q9/00C5B** . . . [N: angularly adjustable]
- B23Q9/00C5C** . . . [N: and being capable of guiding the tool in a circular path]
- B23Q9/00D** . [N: Portable machines cooperating with guide means not supported by the workpiece during working]
- B23Q9/00D2** . . [N: the guide means being fixed to the machine]
- B23Q9/00D4** . . [N: the guide means being fixed to a support]
- B23Q9/00D4B** . . . [N: Angularly adjustable]
- B23Q9/00D4C** . . . [N: Workpieces angularly adjustable relative to the support]
- B23Q9/02** . for securing machines or apparatus to work-pieces, or other parts, of particular shape, e.g. to beams of particular cross-section

Guide heading: **Accessories**

- B23Q11/00** **Accessories fitted to machine tools for keeping tools or parts of the machine in good working condition or for cooling work [N: (accessories specially designed for sawing machines or sawing devices [B23D59/00](#)); Safety devices specially combined with or arranged in, or specially adapted for use in connection with, machine tools (in respect of boring or drilling machines [B23B47/32](#) takes precedence; safety devices in general [F16P](#)) [M1107]**
- B23Q11/00B** . [N: Arrangements for preventing undesired thermal effects on tools or parts of the machine ([B23Q11/10](#), [B23Q11/12](#) and [B23Q11/14](#) take precedence)] [M1107]
- B23Q11/00B2** . . [N: by compensating occurring thermal dilations ([B23Q15/18](#) takes precedence)] [N1107]
- B23Q11/00C** . [N: Arrangements compensating weight or flexion on parts of the machine (adjustment of the fluid layer in fluid bearings or cushions depending upon the position of a weight [B23Q1/38B](#))] [C9601] [M1107]
- B23Q11/00C2** . . [N: using static reinforcing elements, e.g. pre-stressed ties] [M1107]
- B23Q11/00C5** . . [N: compensating the weight of vertically moving elements, e.g. by balancing liftable machine parts ([B23B47/26](#) takes precedence)] [N1107]
- [N: **WARNING** [N1107]

- Subgroups [B23Q11/00C5](#) and [B23Q11/00C5B](#) are not complete, due to a reorganisation in progress; see also [B23Q11/00C](#)]
- [B23Q11/00C5B](#) . . . [N: the elements being rotating or pivoting] [N1107]
- [B23Q11/00C5D](#) . . . [N: using resilient means, e.g. springs, hydraulic dampers] [N1107]
- [B23Q11/00C6](#) . . [N: by actively reacting to a change of the configuration of the machine ([B23Q15/00](#) takes precedence)] [N1107]
- [B23Q11/00D](#) . [N: Arrangements for preventing or isolating vibrations in parts of the machine ([B23B29/02B](#), [B23D47/00B](#) take precedence; means for damping or suppressing vibrations, in general F16F)] [C9609] [M1107]
- [B23Q11/00D2](#) . . [N: by adding or adjusting a mass, e.g. counterweights] [M1107]
- [B23Q11/00D4](#) . . [N: by changing the natural frequency of the system or by continuously changing the frequency of the force which causes the vibration] [M1107]
- [B23Q11/00F](#) . [N: Devices for removing chips ([B23Q11/02](#), [B23Q11/08H](#) take precedence)] [M1107]
- [B23Q11/00F1](#) . . [N: by sucking]
- [B23Q11/00F2](#) . . [N: by blowing]
- [B23Q11/00F3](#) . . [N: using the gravity force]
- [B23Q11/00F4](#) . . [N: outside the working area]
- [B23Q11/00F5](#) . . [N: by sucking and blowing simultaneously]
- [B23Q11/00F6](#) . . [N: by using a magnetic or electric field]
- [B23Q11/00F8](#) . . [N: chip containers located under a machine or under a chip conveyor] [N1204]
- [B23Q11/00F10](#) . . [N: dust collectors for hand tools] [N1204]
- [B23Q11/00F12](#) . . [N: for removing chips or coolant from the workpiece after machining] [N1204]
- [B23Q11/00G](#) . [N: Safety devices protecting the operator, e.g. against accident or noise (**protecting the machine tool** [B23Q5/58](#); **protecting people, in general** [F16P1/00](#), [F16P3/00](#))] [M1107]
- [N: **WARNING** [N1107]
Subgroups [B23Q11/00G2](#) - [B23Q11/00G6](#) are not complete, due to a reorganisation in progress; see also [B23Q11/00G](#)]
- [B23Q11/00G2](#) . . [N: by determining whether the operator is in a dangerous position ([B23Q17/24L2](#) takes precedence)] [N1107]
- [B23Q11/00G4](#) . . [N: by determining whether the machine tool is in a dangerous configuration] [N1107]
- [B23Q11/00G6](#) . . [N: actuating operator protecting means, e.g. closing a cover element, producing an alarm signal] [N1107]
- [B23Q11/00G8](#) . . [N: actuating braking or stopping means] [N1107]
- [B23Q11/00G10](#) . . [N: protecting against noise] [N1204]
- [B23Q11/02](#) . Devices for removing scrap from the cutting teeth of circular [N: or non-circular] cutters [M1107]
- [B23Q11/04](#) . Arrangements preventing overload of tools, e.g. restricting load
- [B23Q11/06](#) . Safety devices for circular cutters

- B23Q11/08 . Protective coverings for parts of machine tools; Splash guards
 - B23Q11/08B . . [N: Foldable coverings, e.g. bellows]
 - B23Q11/08C . . [N: Relatively slidable coverings, e.g. telescopic]
 - B23Q11/08C1 . . . [N: with a non-rectilinear shifting]
 - B23Q11/08C2 . . . [N: with spirally wound coverings]
 - B23Q11/08D . . [N: Flexible coverings, e.g. coiled-up belts] [M1107]
 - B23Q11/08F . . [N: using a liquid bath or a liquid curtain] [M1107]
 - B23Q11/08G . . [N: using covering means adaptable to the workpieces, e.g. curtains or bristles] [M1107]
 - B23Q11/08H . . [N: Wipers for clearing foreign matter from slideways or slidable coverings] [M1107]
 - B23Q11/08J . . [N: for spindles, e.g. for their bearings or casings] [N9601] [M1107]
 - B23Q11/08K . . [N: arranged between the working area and the operator] [N1107]
- [N: **WARNING** [N1107]
Subgroup [B23Q11/08K](#) is not complete, due to a reorganisation in progress; see also [B23Q11/08](#)
]
- B23Q11/10 . Arrangements for cooling or lubricating tools or work ([incorporated in tools, see the relevant subclass for the tool](#), [N: e.g. [B23B27/10](#), [B23B51/06](#), [B23C5/28](#), [B23D77/00C](#); for circular saw blades [B23D59/02](#), for cooling grinding surfaces [B24B55/02](#)]) [M1107]
 - B23Q11/10C . . [N: by submerging the tools or work partially or entirely in a liquid] [M1107]
 - B23Q11/10E . . [N: by supplying a cutting liquid through the spindle] [N1107]
- [N: **WARNING** [N1107]
Subgroups [B23Q11/10E](#) - [B23Q11/10E4](#) are not complete, due to a reorganisation in progress; see also [B23Q11/10](#)
]
- B23Q11/10E2 . . . [N: Tool holders, or tools in general specially adapted for receiving the cutting liquid from the spindle] [N1107]
 - B23Q11/10E4 . . . [N: Rotary joints specially adapted for feeding the cutting liquid to the spindle] [N1107]
 - B23Q11/10F . . [N: using cutting liquids with special characteristics, e.g. flow rate, quality] [N1107]
- [N: **WARNING** [N1107]
Subgroups [B23Q11/10F](#) - [B23Q11/10F6](#) are not complete, due to a reorganisation in progress; see also [B23Q11/10](#)
]
- B23Q11/10F2 . . . [N: using a minimal quantity of lubricant (spraying apparatus using a carrying fluid [B05B7/00](#))] [N1107]
 - B23Q11/10F4 . . . [N: using the cutting liquid at specially selected temperatures (**controlling the temperature of the cutting liquid for maintaining machine parts at a constant temperature** [B23Q11/14H](#))] [N1107]
 - B23Q11/10F6 . . . [N: using cutting liquids with specially selected composition or state of aggregation] [N1107]
 - B23Q11/10J . . [N: Filtration systems specially adapted for cutting liquids (**filtration in general** [B01D24/00](#) - [B01D41/00](#))] [N1107]
 - B23Q11/10K . . [N: with a cutting liquid nozzle specially adaptable to different kinds of machining operations] [N1107]

- [N: **WARNING**Subgroup [B23Q11/10K](#) is not complete, due to a reorganisation in progress; see also [B23Q11/10](#)
[N1107]
]
- [B23Q11/10L](#) . . [N: specially adapted for being fitted to different kinds of machines] [N1107]
- [B23Q11/10N](#) . . [N: specially adapted for portable power-driven tools] [N1107]
- [B23Q11/12](#) . Arrangements for cooling or lubricating parts of the machine ([B23Q11/14](#) takes precedence; [N: movable work or tool supports using fluid bearings or fluid cushion supports [B23Q1/38](#); cooling or lubricating means used in the working area [B23Q11/10](#)]) [C1107]
- [B23Q11/12B](#) . . [N: with lubricating effect for reducing friction ([F16C33/66](#) and [F16H57/04](#) take precedence)] [N1107]
- [N: **WARNING**Subgroups [B23Q11/12B](#) - [B23Q11/12B8](#) are not complete, due to a reorganisation in progress; see also [B23Q11/12](#)
[N1107]
]
- [B23Q11/12B2](#) . . . [N: Lubricant supply devices ([F16N7/00](#) takes precedence)] [N1107]
- [B23Q11/12B4](#) . . . [N: for lubricating spindle bearings ([F16C33/66](#) takes precedence)] [N1107]
- [B23Q11/12B6](#) . . . [N: for lubricating linear guiding systems ([F16C29/00G](#) takes precedence)] [N1107]
- [B23Q11/12B8](#) . . . [N: for lubricating ball screw systems] [N1107]
- [B23Q11/12D](#) . . [N: for cooling only] [N1107]
- [N: **WARNING**Subgroups [B23Q11/12B](#) - [B23Q11/12D4](#) are not complete, due to a reorganisation in progress; see also [B23Q11/12](#)
[N1107]
]
- [B23Q11/12D2](#) . . . [N: for cooling motors or spindles] [N1107]
- [B23Q11/12D4](#) . . . [N: for cooling frame parts] [N1107]
- [B23Q11/14](#) . Methods or arrangements for maintaining a constant temperature in parts of machine tools [C1107]
- [N: **WARNING**Subgroups [B23Q11/14A](#) - [B23Q11/14J](#) are not complete, due to a reorganisation in progress; see also [B23Q11/14](#)
[N1107]
]
- [B23Q11/14A](#) . . [N: using a closed fluid circuit for cooling or heating] [N1107]
- [B23Q11/14B](#) . . [N: comprising heating means] [N1107]
- [B23Q11/14F](#) . . [N: using a jet of gas or cutting liquid] [N1107]
- [B23Q11/14H](#) . . [N: by controlling the temperature of a cutting liquid] [N1107]
- [B23Q11/14J](#) . . [N: by controlling the air temperature] [N1107]
- B23Q13/00** **Equipment for use with tools or cutters when not in operation, e.g. protectors for storage** [N: ([B26B29/00](#) takes precedence)]
- Guide heading:** **Measuring; Indicating; Controlling** [C9609]

- B23Q15/00** **Automatic control or regulation of feed movement, cutting velocity or position of tool or work** ([programme-control G05B19/00](#), e.g. [numerical programme-control G05B19/18](#))
- B23Q15/007 . while the tool acts upon the workpiece
- B23Q15/007B . . [N: Controlling reciprocating movement, e.g. for planing-machine]
- B23Q15/013 . . Control or regulation of feed movement ([B23Q15/12](#) takes precedence)
- B23Q15/02 . . . according to the instantaneous size and the required size of the workpiece acted upon ([B23Q15/06](#) takes precedence)
- B23Q15/04 . . . according to the final size of the previously-machined workpiece ([B23Q15/06](#) takes precedence)
- B23Q15/06 . . . according to measuring results produced by two or more gauging methods using different measuring principles, e.g. by both optical and mechanical gauging
- B23Q15/08 . . Control or regulation of cutting velocity ([B23Q15/12](#) takes precedence)
- B23Q15/10 . . . to maintain constant cutting velocity between tool and workpiece
- B23Q15/12 . . Adaptive control, i.e. adjusting itself to have a performance which is optimum according to a preassigned criterion
- B23Q15/14 . . Control or regulation of the orientation of the tool with respect to the work
- B23Q15/16 . . Compensation for wear of the tool
- B23Q15/18 . . Compensation of tool-deflection due to temperature or force
- B23Q15/20 . before or after the tool acts upon the workpiece
- B23Q15/22 . . Control or regulation of position of tool or workpiece
- B23Q15/22B . . . [N: in feed control, i.e. approaching of tool or work in successive decreasing velocity steps]
- B23Q15/24 . . . of linear position
- B23Q15/26 . . . of angular position
- B23Q15/28 . . with compensation for tool wear
- B23Q16/00** **Equipment for precise positioning of tool or work into particular locations not otherwise provided for** ([automatic control or regulation of position of tool or work B23Q15/22](#); [arrangements for indicating or measuring existing or desired position of tool or work B23Q17/22](#))
- B23Q16/00C . [N: Stops, cams, or holders therefor]
- B23Q16/00C2 . . [N: Stops for use in a hollow spindle]
- B23Q16/00D . [N: with means to return a tool back, after its withdrawal movement, to the previous working position]
- B23Q16/00L . [N: positioning by combining gauges of different dimensions from a set of two or more gauges]
- B23Q16/00M . [N: Equipment for measuring the contacting force or the distance before contacting between two members during the positioning operation]
- B23Q16/00R . [N: positioning by bringing a stop into contact with one of two or more stops, fitted on a

- common carrier]
- B23Q16/00S . [N: Positioning by sine tables] [N9601]
- B23Q16/00T . [N: Cushioning the abutting movement]
- B23Q16/02 . Indexing equipment (specially adapted for gear-cutting machines [B23F23/08](#))
- B23Q16/02B . . [N: in which only the positioning elements are of importance ([B23Q16/04](#), [B23Q16/08](#) take precedence)] [M1107]
- B23Q16/02C . . [N: in which only the indexing movement is of importance]
- B23Q16/02C1 . . . [N: by converting a reciprocating or oscillating movement into or linear indexing movement]
- B23Q16/02C2 . . . [N: and by converting a continuous movement into a linear indexing movement]
- B23Q16/02C3 . . . [N: by converting a continuous movement into a rotary indexing movement]
- B23Q16/02C4 . . . [N: by converting a reciprocating or oscillating movement into a rotary indexing movement]
- B23Q16/02K . . [N: with means for adjusting the distance between two successive indexing-points]
- B23Q16/02L . . [N: with positioning means between two successive indexing-points]
- B23Q16/04 . . having intermediate members, e.g. pawls, for locking the relatively movable parts in the indexed position
- B23Q16/04B . . . [N: with a reciprocating or oscillating drive ([B23Q16/06](#) takes precedence)]
- B23Q16/04C . . . [N: with a continuous drive ([B23Q16/06](#) takes precedence)]
- B23Q16/06 . . . Rotary indexing
- B23Q16/06C [N: with a continuous drive]
- B23Q16/08 . . having means for clamping the relatively movable parts together in the indexed position
- B23Q16/08B . . . [N: with a reciprocating or oscillating drive ([B23Q16/10](#) takes precedence)]
- B23Q16/08C . . . [N: with a continuous drive ([B23Q16/10](#) takes precedence)]
- B23Q16/10 . . . Rotary indexing
- B23Q16/10C [N: with a continuous drive]
- B23Q16/10E [N: clamping with a disc brake] [N1107]
- B23Q16/10G [N: clamping with a drum brake] [N1107]
- B23Q16/12 . . using optics

- B23Q17/00** **Arrangements for [N: observing,] indicating or measuring on machine tools (for automatic control or regulation of feed movement, cutting velocity or position of tool or work [B23Q15/00](#)) [M1107]**
- B23Q17/00C . [N: for indicating or measuring the holding action of work or tool holders ([B23Q3/16](#) takes precedence)] [M1107]
- B23Q17/00C2 . . [N: by measuring a position] [M1107]
- B23Q17/00C4 . . [N: by measuring a force, a pressure or a deformation] [M1107]
- B23Q17/00D . [N: for indicating the presence of a work or tool in its holder ([B23Q17/00C](#), [B23Q17/09](#) take precedence)]
- B23Q17/00F . [N: for managing machine functions not concerning the tool] [N1107]

[N: **WARNING**[N1107]

Subgroups [B23Q17/00F](#) and [B23Q17/00F2](#) are not complete, due to a reorganisation in progress; see also [B23Q17/00](#)

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[B23Q17/00F2](#) . . [N: Life management for parts of the machine (**tool life management** [B23Q17/09L](#))] [N1108]

[B23Q17/09](#) . for indicating or measuring cutting pressure or [N: for determining] cutting-tool condition, e.g. cutting ability, load on tool (**arrangements preventing overload of tools** [B23Q11/04](#); devices for indicating failure of drills during boring [B23B49/00](#)) [M1108]

[B23Q17/09B](#) . . [N: before or after machining] [N1108]

[N: **WARNING** [N1108]

Subgroups [B23Q17/09B](#) - [B23Q17/09B6B](#) are not complete, due to a reorganisation in progress; see also [B23Q17/09](#)

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[B23Q17/09B2](#) . . . [N: Detection of broken tools] [N1108]

[B23Q17/09B4](#) . . . [N: Arrangements for measuring or adjusting cutting-tool geometry machine tools] [N1108]

[B23Q17/09B6](#) . . . [N: Arrangements for measuring or adjusting cutting-tool geometry in presetting devices] [N1108]

[B23Q17/09B6B](#) [N: Tool length] [N1108]

[B23Q17/09B6D](#) [N: Cutting angles of lathe tools] [N1108]

[B23Q17/09B6E](#) [N: Cutting angles of milling cutters] [N1108]

[B23Q17/09B6F](#) [N: Cutting angles of drills] [N1108]

[B23Q17/09B6G](#) [N: Cutting angles of saws] [N1108]

[B23Q17/09B6M](#) [N: Monitoring devices for measuring cutting angles] [N1108]

[B23Q17/09E](#) . . [N: during machining] [N1108]

[N: **WARNING** [N1108]

Subgroups [B23Q17/09E](#) - [B23Q17/09E14](#) are not complete, due to a reorganisation in progress; see also [B23Q17/09](#)

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[B23Q17/09E2](#) . . . [N: Detection of tool breakage (detecting failure of drills [B23B49/00B](#))] [N1108]

[B23Q17/09E4](#) . . . [N: by measuring power, current or torque of a motor] [N1108]

[B23Q17/09E6](#) . . . [N: by measuring a force on parts of the machine other than a motor] [N1108]

[B23Q17/09E8](#) . . . [N: by measuring mechanical vibrations of parts of the machine (**arrangements for measuring vibrations** [B23Q17/12](#))] [N1108]

[B23Q17/09E8B](#) [N: Detection or control of chatter ([B23Q15/12](#) takes precedence)] [N1108]

[B23Q17/09E10](#) . . . [N: by measuring noise] [N1108]

[B23Q17/09E12](#) . . . [N: by measuring temperature] [N1108]

[B23Q17/09E14](#) . . . [N: by measuring features of the machined workpiece (**arrangements for measuring workpiece characteristics** [B23Q17/20](#))] [N1108]

[B23Q17/09L](#) . . [N: Tool life management] [N1108]

[N: **WARNING** [N1108]

This subgroup is not complete, due to a reorganisation in progress; see also [B23Q17/09](#)

]

- B23Q17/10 . for indicating or measuring cutting speed or number of revolutions [C9609]
- B23Q17/12 . for indicating or measuring vibration
- B23Q17/20 . for indicating or measuring workpiece characteristics, e.g. contour, dimension, hardness
- B23Q17/22 . for indicating or measuring existing or desired position of tool or work [N: (B23Q16/00M takes precedence)]
- B23Q17/22A . . [N: Detection or prevention of collisions] [N1108]
- B23Q17/22B . . [N: for adjusting the tool into its holder (B23Q17/09B6B - B23Q17/09B6G takes precedence)] [M1108]
- B23Q17/22B2 . . . [N: with the toolholder as reference-element]
- B23Q17/22C . . [N: for adjusting the tool relative to the workpiece]
- B23Q17/22C1 . . . [N: Detection of contact between tool and workpiece] [N1108]
- B23Q17/22C2 . . . [N: of a workpiece relative to the tool-axis]
- B23Q17/22C2B [N: the workpiece rotating during the adjustment relative to the tool axis]
- B23Q17/22C4 . . . [N: of a tool relative to a workpiece-axis]
- B23Q17/22C6 . . . [N: of a tool-axis relative to a workpiece-axis]
- B23Q17/22K . . [N: for adjusting the distance between coaxially rotating tools]
- B23Q17/22L . . [N: for adjusting the workpiece relative to the holder thereof]
- B23Q17/24 . using optics [N: or electromagnetic waves] [C1108]
- B23Q17/24B . . [N: Arrangements for improving direct observation of the working space, e.g. using mirrors or lamps (structural combinations of lighting devices with other articles, not otherwise provided for, F21V33/00)] [M1108]
- B23Q17/24D . . [N: Arrangements for indirect observation of the working space using image recording means, e.g. a camera] [N1108]
- [N: **WARNING** [N1108]
This subgroup is not complete, due to a reorganisation in progress; see also [B23Q17/24](#)]
- B23Q17/24F . . [N: for indicating desired positions guiding the positioning of tools or workpieces (B25H1/00C5C takes precedence)] [N1108]
- [N: **WARNING** [N1108]
Subgroups [B23Q17/24F](#) - [B23Q17/24F4](#) are not complete, due to a reorganisation in progress; see also [B23Q17/24](#)]
- B23Q17/24F2 . . . [N: by projecting a single light beam] [N1108]
- B23Q17/24F4 . . . [N: by projecting crossing light beams] [N1108]
- B23Q17/24G . . [N: for measuring existing positions of tools or workpieces] [N1108]
- [N: **WARNING** [N1108]
This subgroup is not complete, due to a reorganisation in progress; see also [B23Q17/24](#)]
- B23Q17/24H . . [N: Detection of presence or absence] [N1108]

[N: **WARNING** [N1108]

Subgroups [B23Q17/24L](#) - [B23Q17/24L6](#) are not complete, due to a reorganisation in progress; see also [B23Q17/24](#)

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- B23Q17/24H1 . . . [N: of an operator or a part thereof] [N1108]
- B23Q17/24H2 . . . [N: of a tool] [N1108]
- B23Q17/24H4 . . . [N: of a workpiece] [N1108]
- B23Q17/24J . . [N: for measuring features or for detecting a condition of machine parts, tools or workpieces ([B23Q17/24G](#), [B23Q17/24H](#) take precedence)] [N1108]

[N: **WARNING** [N1108]

Subgroups [B23Q17/24J](#) - [B23Q17/24J6](#) are not complete, due to a reorganisation in progress; see also [B23Q17/24](#)

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- B23Q17/24J2 . . . [N: of tools] [N1108]
- B23Q17/24J2B [N: Length] [N1108]
- B23Q17/24J2C [N: Diameter] [N1108]
- B23Q17/24J4 . . . [N: of workpieces] [N1108]
- B23Q17/24J6 . . . [N: of clamping devices, e.g. work or tool holders] [N1108]
- B23Q17/24N . . [N: using special electromagnetic means or methods] [N1108]

[N: **WARNING** [N1108]

Subgroups [B23Q17/24N](#) - [B23Q17/24N6](#) are not complete, due to a reorganisation in progress; see also [B23Q17/24](#)

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- B23Q17/24N2 . . . [N: using interruptions of light beams] [N1108]
- B23Q17/24N4 . . . [N: using image analysis, e.g. for radar, infrared or array camera images] [N1108]
- B23Q17/24N6 . . . [N: using interferometers] [N1108]

B23Q23/00 **Arrangement for compensating for irregularities or wear, e.g. of ways, of setting mechanisms** ([automatic control](#) [B23Q15/00](#))

B23Q27/00 **Geometrical mechanisms for the production of work of particular shapes, not fully provided for in another subclass**

B23Q27/00B . . [N: of conical non-circular section manufactured by an apparatus with a first rotational cutting vector and a second linear feed vector, intersecting the first vector]

B23Q27/00C . . [N: by rolling without slippage two bodies of particular shape relative to each other]

Guide heading: **Copying**

Note

In groups [B23Q33/00](#) or [B23Q35/00](#), the following term is used with the meaning indicated:- "copying" covers the derivation of a required shape from a pattern, of the same or a different shape or scale, by a mechanism or equivalent means controlled by a member following the pattern. The pattern may be a model or drawing, or an element

such as a cam incorporated in the operating mechanism of a machine. This term does not cover the derivation of a required shape from simple geometrical shapes, e.g. generating a cycloid by a rolling circle, which in general is provided for in group [B23Q27/00](#)

- B23Q33/00** **Methods for copying**
- B23Q35/00** **Control systems or devices for copying directly from a pattern or a master model; Devices for use in copying manually [N: (copy milling classified also in [B27C5/00B](#))]**
- [B23Q35/00B](#) . [N: Copying by a curve composed of arcs of circles]
- [B23Q35/02](#) . Copying discrete points from the pattern, e.g. for determining the position of holes to be drilled
- [B23Q35/04](#) . using a feeler or the like travelling along the outline of the pattern, model or drawing; Feelers, patterns, or models therefor
- [B23Q35/06](#) . . specially adapted for controlling successive operations e.g. separate cuts, on a workpiece
- [B23Q35/08](#) . . Means for transforming movement of the feeler or the like into feed movement of tool or work
- [B23Q35/10](#) . . . mechanically only
- [B23Q35/10B](#) [N: with a pattern composed of one or more lines used simultaneously for one tool]
- [B23Q35/10B2](#) [N: of one line]
- [B23Q35/10B2B](#) [N: which turns continuously]
- [B23Q35/10B2C](#) [N: with coaxial tool and feeler]
- [B23Q35/10B4](#) [N: of two lines]
- [B23Q35/10B4C](#) [N: with a single tool and two feelers rotating about parallel axis]
- [B23Q35/10B4C2](#) {7 dots} [N: tool and feelers being coaxial]
- [B23Q35/10B6](#) [N: of three or more lines]
- [B23Q35/10C](#) [N: with a continuously turning pattern ([B23Q35/10B](#) takes precedence)]
- [B23Q35/12](#) . . . involving electrical means (programme recording for copying purposes in a separate apparatus [G05](#), [G11](#))
- [B23Q35/121](#) using mechanical sensing
- [B23Q35/122](#) the feeler opening or closing electrical contacts
- [B23Q35/123](#) the feeler varying the impedance in a circuit
- [B23Q35/124](#) varying resistance
- [B23Q35/125](#) varying capacitance
- [B23Q35/126](#) varying inductance
- [B23Q35/127](#) using non-mechanical sensing
- [B23Q35/128](#) Sensing by using optical means
- [B23Q35/129](#) Sensing by means of electric discharges
- [B23Q35/13](#) Sensing by using magnetic means

- B23Q35/14 controlling one or more electromotors
- B23Q35/16 controlling fluid motors
- B23Q35/18 involving fluid means ([B23Q35/16](#) takes precedence)
- B23Q35/18B [N: with a pattern composed of one or more lines used simultaneously]
- B23Q35/18B2 [N: of one line]
- B23Q35/18B2B [N: turning continuously]
- B23Q35/18B4 [N: of two lines]
- B23Q35/18C [N: with a continuously turning pattern ([B23Q35/18B](#) takes precedence)]
- B23Q35/20 with special means for varying the ratio of reproduction
- B23Q35/22 specially adapted for compensating for wear of the tool
- B23Q35/24 Feelers; Feeler units
- B23Q35/26 designed for a physical contact with a pattern or a model
- B23Q35/28 for control of a mechanical copying system
- B23Q35/30 for control of an electrical or electro-hydraulic copying system
- B23Q35/32 in which the feeler makes and breaks an electrical contact or contacts, e.g. with brush-type tracers
- B23Q35/34 in which the feeler varies an electrical characteristic in a circuit, e.g. capacity, frequency
- B23Q35/36 for control of a hydraulic or pneumatic copying system
- B23Q35/38 designed for sensing the pattern, model, or drawing without physical contact ([sensing by means of a fluid jet B23Q35/36](#))
- B23Q35/40 involving optical or photoelectrical systems
- B23Q35/42 Patterns; Masters models
- B23Q35/44 provided with means for adjusting the contact face, e.g. comprising flexible bands held by set-screws
- B23Q35/46 Supporting devices therefor

- B23Q35/48 using a feeler or the like travelling to-and-fro between opposite parts of the outline of the pattern, model or drawing [M1108]

Guide heading: **Metal-working machines comprising units or sub-assemblies; Associations of metal-working machines or units** [[C9609](#)]

- B23Q37/00** **Metal-working machines, or constructional combinations thereof, built-up from units designed so that at least some of the units can form parts of different machines or combinations; Units therefor in so far as the feature of interchangeability is important** (features relating to particular metal-working operations, see the relevant subclass, e.g. [B23P23/00](#)) [M1207]

- B23Q37/00B [N: Convertible machines, e.g. from horizontally working into vertically working ([B27B5/16B](#): convertible sawing devices)]

- B23Q37/00D [N: Modular base frames] [N1204]

- B23Q37/00E [N: Modular machining stations designed to be linked to each other] [N1204]

- B23Q39/00** **Metal-working machines incorporating a plurality of sub-assemblies, each capable of performing a metal-working operation** ([B23Q33/00](#), [B23P23/00](#) take precedence; if

the operations are similar and the kind of operation is essential, see the relevant subclass for the operation) **[M1207]**

- B23Q39/02 . the sub-assemblies being capable of being brought to act at a single operating station
- B23Q39/02B . . [N: with a plurality of toolheads per workholder, whereby the toolhead is a main spindle, a multispindle, a revolver or the like] **[N0701]**
- B23Q39/02B2 . . . [N: with same working direction of toolheads on same workholder] **[N0701]**
- B23Q39/02B2B [N: simultaneous working of toolheads] **[N0701]**
- B23Q39/02B2D [N: consecutive working of toolheads] **[N0701]**
- B23Q39/02B4 . . . [N: with different working directions of toolheads on same workholder] **[N0701]**
- B23Q39/02B4B [N: simultaneous working of toolheads] **[N0701]**
- B23Q39/02B4D [N: consecutive working of toolheads] **[N0701]**
- B23Q39/02D . . [N: with a plurality of workholder per toolhead in operating position (with only one workholder in operating position B23Q1/66)] **[N0701]**
- B23Q39/02D2 . . . [N: with a twin table for alternatively working on one of the tables] **[N1204]**

- B23Q39/04 . the sub-assemblies being arranged to operate simultaneously at different stations, e.g. with an annular work-table moved in steps ([associations of machines connected only by work-transferring means B23Q41/00](#))
- B23Q39/04B . . [N: with circular arrangement of the sub-assemblies]
- B23Q39/04B1 . . . [N: having at least one tool station cooperating with each work holder, e.g. multi-spindle lathes] **[N9805]**
- B23Q39/04B3 . . . [N: including a loading and/or unloading station] **[N9805]**
- B23Q39/04C . . [N: the work holder of a work station transfers directly its workpiece to the work holder of a following work station]

- B23Q41/00** **Combinations or associations of metal-working machines not directed to a particular result according to classes **B21**, **B23**, or **B24** ([B23Q37/00](#), [B23Q39/00](#) take precedence; features relating to operations performed, if the different metal-working operations are of the same kind, [see](#) the subclass for the kind of operation, e.g. punching [B21D](#), welding [B23K](#), grinding [B24B](#); features relating to technically specified combinations of different metal-working operations [B23P23/00](#)) **[C9609]****

- B23Q41/02 . Features relating to transfer of work between machines ([arrangements for handling work for machine tools coordinated in production lines B23Q7/14](#)) **[M1108]**
- B23Q41/04 . Features relating to relative arrangements of machines
- B23Q41/06 . Features relating to organisation of working of machines
- B23Q41/08 . Features relating to maintenance of efficient operation