

ECLA EUROPEAN CLASSIFICATION

B23D **PLANING; SLOTTING; SHEARING; BROACHING; SAWING; FILING; SCRAPING; LIKE OPERATIONS FOR WORKING METAL BY REMOVING MATERIAL, NOT OTHERWISE PROVIDED FOR (making toothed gears or the like B23F; cutting metal by applying heat locally B23K; arrangements for copying or controlling B23Q)**

Guide heading: Planing; Slotting

B23D1/00 **Planing or slotting machines cutting by relative movement of the tool and workpiece in a horizontal straight line only**

- B23D1/00B . [N: for planing elongated workpieces]
- B23D1/00B1 . . [N: Rails]
- B23D1/02 . by movement of the work-support
- B23D1/04 . . with the tool supported only on one side of the bed
- B23D1/06 . . with the tool supported on both sides of the bed
- B23D1/08 . by movement of the tool
- B23D1/10 . . with means for adjusting the tool-guide vertically
- B23D1/12 . . . with the tool supported only on one side of the bed
- B23D1/14 . . . with the tool supported on both sides of the bed
- B23D1/16 . . without means for adjusting the tool-guide vertically
- B23D1/18 . cutting on both the forward and the return stroke
- B23D1/20 . with tool-supports or work-supports specially mounted or guided for working in different directions or at different angles; Special purpose machines
- B23D1/20B . . [N: Planing nuts, bolt heads or other prismatic workpieces]
- B23D1/22 . . for planing ingots or the like (scrubbing or peeling ingots by milling [B23C3/14](#))
- B23D1/24 . . for planing inner surfaces, e.g. of moulds
- B23D1/26 . . for planing edges or ridges or cutting grooves (cutting helical grooves [B23D5/02](#))
- B23D1/28 . . in which the tool or workpiece is fed otherwise than in a straight line, e.g. for planing profiled stock
- B23D1/30 . . . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q35/00](#))

B23D3/00 **Planing or slotting machines cutting by relative movement of the tool and workpiece in a vertical or inclined straight line**

- B23D3/02 . for cutting grooves (cutting helical grooves [B23D5/02](#))
- B23D3/04 . in which the tool or workpiece is fed otherwise than in a straight line

- B23D3/06 . . . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q35/00](#))

- B23D5/00 Planing or slotting machines cutting otherwise than by relative movement of the tool and workpiece in a straight line**

- B23D5/02 . involving rotary and straight-line movements only, e.g. for cutting helical grooves
- B23D5/04 . controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q35/00](#))

- B23D7/00 Planing or slotting machines characterised only by constructional features of particular parts (constructional features of these parts per se [B23Q](#))**

- B23D7/02 . of frames; of work-table beds
- B23D7/04 . of pillars, of cross-beams
- B23D7/06 . of tool-carrying arrangements
- B23D7/08 . of work-tables
- B23D7/10 . of drives for reciprocating parts
- B23D7/10B . . [N: hydraulically driven]
- B23D7/12 . of arrangements for impact damping or regenerating energy

- B23D9/00 Hand-operated planing devices; Portable planing apparatus**

- B23D11/00 Planing or slotting devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool**

- B23D13/00 Tools or tool holders specially designed for planing or slotting machines (features applicable also to turning-machines [B23B27/00](#), [B23B29/00](#); for cutting gear teeth [B23F21/04](#))**

- B23D13/00B . [N: Tools or tool holders adapted to operate in both the forward and return stroke]
- B23D13/02 . Pivotaly-mounted holders
- B23D13/04 . Holders for tool sets
- B23D13/06 . Devices for lifting or lowering the tool

- Guide heading: Shearing; Similar cutting**

- B23D15/00 Shearing machines or shearing devices cutting by blades which move parallel to themselves**

- B23D15/00B . [N: for cutting in more than one direction, e.g. angle cutting] [N9506]
- B23D15/00C . [N: for bias cutting of webs or sheets] [N9506]
- B23D15/02 . having both upper and lower moving blades
- B23D15/04 . having only one moving blade
- B23D15/06 . Sheet shears [N: ([B23D15/00B](#) and [B23D15/00C](#) take precedence)] [C9506]
- B23D15/08 . . with a blade moved in one plane, e.g. perpendicular to the surface of the sheet
- B23D15/10 . . with a blade moved in a curved surface, e.g. for producing an edge with a curved cross-section
- B23D15/12 . characterised by drives or gearings therefor
- B23D15/14 . . actuated by fluid or gas pressure
- B23D15/14B . . . [N: actuated by explosion]
- B23D17/00** **Shearing machines or shearing devices cutting by blades pivoted on a single axis** (on an axis parallel to the blade [B23D15/10](#); hand-held devices [B23D29/00](#))
- B23D17/02 . characterised by drives or gearings therefor
- B23D17/04 . . actuated by a rotary shaft
- B23D17/06 . . actuated by fluid or gas pressure
- B23D17/08 . . actuated by hand or foot operated lever mechanism
- B23D19/00** **Shearing machines or shearing devices cutting by rotary discs** (by friction saw-discs [B23D45/00](#))
- B23D19/02 . having both a fixed shearing blade and a rotary shearing disc
- B23D19/04 . having rotary shearing discs arranged in co-operating pairs
- B23D19/06 . . with several spaced pairs of shearing discs working simultaneously, e.g. for trimming or making strips
- B23D19/06B . . . [N: for cutting along lines not parallel to the longitudinal direction of the material, e.g. oblique or zig-zag cutting]
- B23D19/08 . for special use, e.g. for cutting curves, for chamfering edges
- B23D21/00** **Machines or devices for shearing or cutting tubes** (by sawing, see the relevant groups for sawing machines or sawing devices; as additional equipment for deep drawing presses [B21D24/16](#))
- B23D21/00B . [N: by tools working in different directions successively] [N9506]
- B23D21/00C . [N: and sealing, crushing or chamfering the tubes] [N9506]
- B23D21/02 . otherwise than in a plane perpendicular to the axis of the tube, e.g. for making mitred cuts, for making bicycle frames

- B23D21/04 . Tube-severing machines with rotating tool-carrier
- B23D21/06 . Hand-operated tube-cutters
- B23D21/08 . . with cutting wheels
- B23D21/10 . . with other cutting blades or tools
- B23D21/12 . . . with provision for hammering on the tool
- B23D21/14 . cutting inside the tube
- B23D21/14B . . [N: hand operated]

- B23D23/00** **Machines or devices for shearing or cutting profiled stock (hand-held devices [B23D29/00](#))**
- B23D23/02 . otherwise than in a plane perpendicular to the axis of the stock
- B23D23/04 . by means of holding-dies, arranged side by side, subjecting the stock to torsional stress

- B23D25/00** **Machines or arrangements for shearing stock while the latter is travelling otherwise than in the direction of the cut (controlling slack in travelling flexible stock [B21C47/10](#))**
- B23D25/02 . Flying shearing machines ([B23D25/12](#) takes precedence)
- B23D25/04 . . in which a cutting unit moves bodily with the work while cutting ([B23D25/06](#) takes precedence)
- B23D25/06 . . having a cutting device mounted on an oscillating lever
- B23D25/08 . . having two coacting shearing bladed mounted independently
- B23D25/10 . . . on co-operating beams moving parallel to each other and attached to lever mechanisms
- B23D25/12 . shearing machines with blades on coacting rotating drums
- B23D25/14 . without regard to the exact dimensions of the resulting material, e.g. for cutting-up scrap

- B23D27/00** **Machines or devices for cutting by a nibbling action**
- B23D27/02 . Hand-held devices
- B23D27/04 . . actuated by electric power
- B23D27/06 . . actuated by fluid or gas pressure

- B23D29/00** **Hand-held metal-shearing or metal-cutting devices (with nibbling action [B23D27/02](#); hand-operated devices for metal-cutting otherwise than by shearing [B26B](#))**
- B23D29/00B . [N: for cutting wire or the like]
- B23D29/00C . [N: for cutting sheets]

- B23D29/00D . [N: for splitting nuts (hand operated tools with cutting action actuated by muscle power [B26B17/00A](#))]
- B23D29/02 . Hand-operated metal-shearing devices
- B23D29/02B . . [N: for cutting wires]
- B23D29/02C . . [N: for cutting sheets]
- B23D31/00** **Shearing machines or shearing devices covered by none or more than one of the groups [B23D15/00](#) to [B23D29/00](#); Combinations of shearing machines**
- B23D31/00B . [N: for trimming deep drawn products (combined with deep-drawing presses [B21D24/16](#))]
- B23D31/00C . [N: Breaking machines, i.e. pre-cutting and subsequent breaking]
- B23D31/00C2 . . [N: for rings]
- B23D31/00D . [N: Cutting-up scrap (disintegrating by knives in general [B02C18/00](#); cutting-up scrap while the material is travelling otherwise than in the direction of the cut [B23D25/14](#))]
- B23D31/02 . for performing different cutting operations on travelling stock, e.g. slitting and severing simultaneously
- B23D31/04 . for trimming stock combined with devices for shredding scrap
- B23D33/00** **Accessories for shearing machines or shearing devices (feeding stock to machines or removing stock [B21D43/00](#))**
- B23D33/00B . [N: for obtaining pieces of a predetermined weight or volume, e.g. control arrangements ([B23D36/00B12](#) takes precedence)]
- B23D33/00C . [N: for obtaining pieces of a predetermined length, e.g. control arrangements ([B23D36/00B13](#) takes precedence)]
- B23D33/02 . Arrangements for holding, guiding, and/or feeding work during the operation
- B23D33/02B . . [N: Guillotines with holding means behind the knives]
- B23D33/04 . . for making circular cuts
- B23D33/06 . . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q35/00](#))
- B23D33/08 . Press-pads; Counter-bases; Hold-down devices
- B23D33/10 . Stop for positioning work
- B23D33/12 . Equipment for indicating where to cut
- B23D35/00** **Tools for shearing machines or shearing devices; Holders or chucks for shearing tools**
- B23D35/00B . [N: cutting members]

- B23D35/00C . [N: Means for mounting the cutting members]
- B23D35/00C2 . . [N: for circular cutting members]
- B23D35/00D . [N: Adjusting the position of the cutting members]
- B23D35/00D2 . . [N: for circular cutting members]
- B23D35/00E . [N: Means for changing the cutting members (mounting per se [B23D35/00C](#))]

B23D36/00

Control arrangements specially adapted for machines for shearing or similar cutting, or for sawing, stock which the latter is travelling otherwise than in the direction of the cut

- B23D36/00B . [N: for machines with only one cutting, sawing, or shearing devices]
- B23D36/00B11 . . [N: for minimising waste]
- B23D36/00B12 . . [N: for obtaining pieces of a predetermined weight or volume]
- B23D36/00B13 . . [N: for obtaining pieces of a predetermined length]
- B23D36/00B13B . . . [N: the tool moving continuously]
- B23D36/00B13B2 [N: and taking account of marks, e.g. on the stock]
- B23D36/00B13C . . . [N: the tool stopping for a considerable time after each cutting operation]
- B23D36/00B13C2 [N: and taking account of marks, e.g. on the stock]
- B23D36/00B13D . . . [N: and taking account of the temperature of the stock]
- B23D36/00B14 . . [N: for cutting off of the ends of the products, e.g. cropping shears]
- B23D36/00C . [N: for machines with more than one cutting, shearing, or sawing devices]

Broaching**B23D37/00**

Broaching machines or broaching devices

- B23D37/00B . [N: for cylindrical workpieces, e.g. crankshafts (takes precedence over other subgroups)]
- B23D37/02 . Broaching machines with horizontally-arranged working tools
- B23D37/04 . . for broaching inner surfaces
- B23D37/06 . . for broaching outer surfaces
- B23D37/08 . Broaching machines with vertically-arranged working tools
- B23D37/10 . . for broaching inner surfaces
- B23D37/12 . . for broaching outer surfaces
- B23D37/14 . Broaching machines with rotatably-arranged working tools
- B23D37/16 . . for broaching helical grooves
- B23D37/18 . Broaching machines with working tools mounted on an endless chain or belt
- B23D37/20 . Broaching machines with arrangements for working in opposite directions

- B23D37/22 . for special purposes ([B23D37/14](#) takes precedence)
- B23D39/00** **Accessories for broaching machines or broaching devices**
- B23D41/00** **Broaching machines or broaching devices characterised only by constructional features of particular parts** (constructional features of these parts per se [B23Q](#))
- B23D41/02 . of frames; of work supports
- B23D41/04 . of tool-carrying arrangements
- B23D41/06 . of devices for feeding, clamping, or ejecting workpieces
- B23D41/08 . of drives; of control devices
- B23D41/08B . . [N: Hydraulic drives]
- B23D41/08C . . [N: Control devices]
- B23D43/00** **Broaching tools** (for cutting gear teeth [B23F21/26](#))
- B23D43/00C . [N: for cutting helical grooves]
- B23D43/02 . for cutting by rectilinear movement ([B23D43/08](#) takes precedence)
- B23D43/04 . . having inserted cutting edges
- B23D43/06 . for cutting by rotational movement
- B23D43/08 . mounted on an endless chain or belt
- Guide heading:** **Sawing** (surgical saws [A61B17/14](#); sawing wood or similar material [B27B](#); [N: sawing stone [B28D1/02](#)])
- B23D45/00** **Sawing machines or sawing devices with circular saw blades or with friction saw discs** (shearing machines with rotary discs [B23D19/00](#) to [B23D25/00](#))
- B23D45/00B . [N: for particular purposes]
- B23D45/00C . [N: with means to attach the sawing device to the workpiece]
- B23D45/02 . with a circular saw blade or the stock mounted on a carriage
- B23D45/02A . . [N: with the saw blade mounted on a carriage ([B23D45/06](#), [B23D45/04A2](#) take precedence)]
- B23D45/02A1 . . . [N: the carriage performing a vertical movement only]
- B23D45/02A2 . . . [N: the saw blade being adjustable according to depth or angle of cut ([B23D45/02A1](#) takes precedence)]
- B23D45/02A2A [N: Radial sawing machines]
- B23D45/02A4 [N: the saw carriage being mounted on a carriage, e.g. gantry-type sawing]

- machines]
- B23D45/02A6 . . . [N: the saw carriage being mounted on a pivoted lever]
- B23D45/04 . with a circular saw blade or the stock carried by a pivoted lever
- B23D45/04A . . [N: with the saw blade carried by a pivoted lever ([B23D45/02A6](#), [B23D45/06B](#) take precedence)]
- B23D45/04A1 . . . [N: the saw blade being adjustable according to angle of cut ([B23D45/02A2A](#) takes precedence)]
- B23D45/04A2 . . . [N: the pivoted lever being mounted on a carriage]
- B23D45/04A2A [N: the saw blade being adjustable according to angle of cut]
- B23D45/06 . with a circular saw blade arranged underneath a stationary work-table
- B23D45/06A . . [N: the saw blade being mounted on a carriage]
- B23D45/06A1 . . . [N: the saw blade being adjustable according to depth or angle of cut]
- B23D45/06A2 . . . [N: the carriage performing a vertical movement only]
- B23D45/06B . . [N: with the saw blade carried by a pivoted lever]
- B23D45/06B2 . . . [N: the pivoted lever being mounted on a carriage]
- B23D45/06B4 . . . [N: the saw blade being adjustable according to depth or angle of cut]
- B23D45/06C . . [N: the saw blade being adjustable according to depth or angle of cut ([B23D45/06A](#), [B23D45/06B](#) take precedence)]
- B23D45/08 . with a ring blade having inside saw teeth
- B23D45/10 . with a plurality of circular saw blades [N: ([B23D45/14C](#), [B23D45/16B](#) take precedence)]
- B23D45/10B . . [N: some of which turn about perpendicular axes ([B23D45/14C](#) takes precedence)] [C9409]
- B23D45/10C . . [N: operating within the same plane]
- B23D45/10D . . [N: mounted on a turret]
- B23D45/12 . with a circular saw blade for cutting tubes
- B23D45/12B . . [N: for cutting slots in tubes]
- B23D45/12C . . [N: the workpieces turning about their longitudinal axis during the cutting operations]
- B23D45/12D . . [N: with the tool turning around the workpieces]
- B23D45/12F . . [N: with the tool introduced into the tubes and cutting from the inside outwards]
- B23D45/14 . for cutting otherwise than in a plane perpendicular to the axis of the stock, e.g. for making a mitred cut
- B23D45/14C . . [N: with a plurality of circular saw blades]
- B23D45/14C2 . . . [N: the saw blades being angularly fixed]
- B23D45/16 . Hand-held sawing devices with circular saw blades
- B23D45/16B . . [N: with a plurality of saw blades or saw blades having plural cutting zones]
- B23D45/18 . Machines with circular saw blades for sawing stock while the latter is travelling otherwise than in the direction of the cut ([control of such machines B23D36/00](#))
- B23D45/20 . . Flying sawing machines, the saw carrier of which is reciprocated in a guide and

- moves with the travelling stock during sawing
- B23D45/22
 - . . Flying sawing machines with lever-supported saw carrier which moves in a complete circular path
- B23D45/24
 - . . Flying sawing machines with lever-supported saw carrier which oscillates in an arc
- B23D45/26
 - . with high-speed cutting discs, performing the cut by frictional heat melting the material (grinders for cutting-off [B24B27/06](#))
- B23D47/00**
 - Sawing machines or sawing devices working with circular saw blades, characterised only by constructional features of particular parts (constructional features of these parts per se [B23Q](#); details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed [B25F5/00](#))**
- B23D47/00B
 - . [N: Vibration-damping]
- B23D47/02
 - . of frames; of guiding arrangements for work-table or saw-carrier
- B23D47/02B
 - . . [N: of tables]
- B23D47/04
 - . of devices for feeding, positioning, clamping, or rotating work
- B23D47/04B
 - . . [N: for conveying work to, or discharging work from, the machine]
- B23D47/04C
 - . . [N: feeding work into engagement with the saw blade]
- B23D47/04C1
 - . . . [N: the work being mounted on rotating work support]
- B23D47/06
 - . . for stock of indefinite length
- B23D47/06B
 - . . . [N: for laterally feeding long workpieces]
- B23D47/08
 - . of devices for bringing the circular saw blade to the workpiece or removing same therefrom
- B23D47/10
 - . . actuated by fluid or gas pressure
- B23D47/12
 - . of drives for circular saw blades
- B23D47/12B
 - . . [N: acting on the disc of the saw blade]
- B23D47/12D
 - . . [N: Angle drives]
- B23D49/00**
 - Machines or devices for sawing with straight reciprocating saw blades, e.g. hacksaws**
- B23D49/00B
 - . [N: transportable, e.g. fitted with wheels]
- B23D49/00C
 - . [N: with means to attach the sawing device to the work]
- B23D49/00D
 - . [N: having a plurality of saw blades or saw blades having plural cutting zones]
- B23D49/00D2
 - . . [N: with opposed saw blades]
- B23D49/00D4
 - . . [N: with contiguous, oppositely reciprocating saw blades]
- B23D49/00J
 - . [N: Jig saws, i.e. machine saws with a vertically reciprocating narrow saw blade chucked at both ends for contour cutting]
- B23D49/00J2
 - . . [N: hand-driven or foot-driven]
- B23D49/02
 - . Hacksaw machines with straight saw blades secured to a rectilinearly-guided frame,

- e.g. with the frame fed stepwise in the plane of the guide
- B23D49/04 . Hacksaw machines with straight saw blades secured to a pivotally-arranged frame
- B23D49/06 . Hacksaw machines with straight saw blades for special use
- B23D49/08 . Pad-saw machines, i.e. machines in which the blade is attached to a carrier at one end only
- B23D49/10 . Hand-held or hand-operated sawing devices with straight saw blades
- B23D49/10B . . [N: with means for guiding the sawing device]
- B23D49/11 . . for special purposes, e.g. offset-blade hand; [N: Hand saws having spaced blades; Hand saws for sawing grooves or square holes] [N9602]
- B23D49/12 . . Hacksaws ([B23D49/11](#), [B23D49/16](#) take precedence; bows adjustable in length or height [B23D51/12](#)) [C9602]
- B23D49/12B . . . [N: with wire-type frames]
- B23D49/14 . . Pad saws [N: ([B23D49/10B](#), [B23D49/11](#), [B23D49/16](#) take precedence)][C9602]
- B23D49/16 . . actuated by electric or magnetic power or prime movers ([B23D49/11](#) takes precedence) [C9602]
- B23D49/16B . . . [N: Pad sawing devices]
- B23D49/16B1 [N: with means to move the saw blades in an orbital path]
- B23D49/16B2 [N: with means to adjust the guide plate or with means to adjust the plane in which the saw blade moves]

- B23D51/00** **Sawing machines or sawing devices working with straight blades, characterised only by constructional features of particular parts** (constructional features of these parts per se [B23Q](#); details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed [B25F5/00](#)); **Carrying or attaching means for tools, covered by this subclass, which are connected to a carrier at both ends**
- B23D51/00B . [N: Devices for moving the tool to the workpiece]
- B23D51/01 . characterised by the handle [N9602]
- B23D51/02 . of beds; of guiding arrangements for work-tables or saw carriers; of frames
- B23D51/02G . . [N: of arrangements for guiding the saw blade]
- B23D51/03 . . with extensible or collapsible frames; [N: Frames with spare blade storage means] [N9602]
- B23D51/04 . of devices for feeding, positioning, clamping, or rotating work
- B23D51/04B . . [N: for conveying work to, or discharging work from, the machine]
- B23D51/04C . . [N: for feeding work into engagement with the saw blade, e.g. rotating work while sawing]
- B23D51/06 . . for stock of indefinite length
- B23D51/06B . . . [N: for laterally feeding long workpieces]
- B23D51/08 . of devices for mounting straight saw blades or other tools

- B23D51/10 . . . for hand-held or hand-operated devices
- B23D51/12 . . . for use with tools, dealt with in this subclass, which are connected to a carrier at both ends, e.g. bows adjustable in length or height
- B23D51/12B [N: Blade tensioning means]
- B23D51/14 Attachment of the tool
- B23D51/16 . . . of drives or feed mechanisms for straight tools, e.g. saw blades, or bows
- B23D51/16B . . . [N: Vibratory electromagnetic drives therefor]
- B23D51/16C . . . [N: Devices for arresting movement of the saw blades ([B23D51/20](#) takes precedence)] [N9607]
- B23D51/18 . . . actuated by fluid or gas pressure ([B23D51/20](#) takes precedence)
- B23D51/20 . . . with controlled feed of the tool, or with special arrangements for relieving or lifting the tool on the return stroke

- B23D53/00** **Machines or devices for sawing with strap saw-blades which are effectively endless in use, e.g. for contour cutting**
- B23D53/00B . . [N: transportable, e.g. fitted with wheels]
- B23D53/00C . . [N: with means to attach the sawing device to the workpiece]
- B23D53/00D . . [N: with a plurality of band saw blades or band saw blades having plural cutting zones, e.g. contiguous oppositely-moving saw blade portions ([for length cutting of trunks B27B15/08](#))]
- B23D53/00E . . [N: Convertible sawing devices]
- B23D53/00F . . [N: Open-end band saws]
- B23D53/02 . . with stationarily-mounted wheels, [N: i.e. during sawing] carrying the strap ([B23D53/06](#) takes precedence)
- B23D53/02B . . . [N: Arrangements for tilting the head carrying the saw wheels]
- B23D53/02H . . . [N: the band saw blade being guided in a horizontal plane] [N0202]
- B23D53/04 . . with the wheels carrying the strap mounted shiftably or swingingly, [N: i.e. during sawing], other than merely for adjustment
- B23D53/04B . . . [N: with pivotedly mounted head carrying the saw wheels]
- B23D53/06 . . with shiftable or swinging work-table
- B23D53/08 . . for cutting profiled stock
- B23D53/10 . . Sawing devices working with strap saw-blades able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool
- B23D53/12 . . Hand-held or hand-operated sawing devices working with strap saw blades

- B23D55/00** **Sawing machines or sawing devices working with strap saw blades, characterised only by constructional features of particular parts ([constructional features of these parts per se B23Q](#))**

- B23D55/00B . [N: Devices for damping vibrations]
- B23D55/02 . of frames; of tables
- B23D55/02B . . [N: of tables ([B23D53/06](#) takes precedence)]
- B23D55/02B2 . . . [N: the table being adjustable according to depth or angle of cut]
- B23D55/04 . of devices for feeding or clamping work
- B23D55/04B . . [N: for conveying work to the sawing machine]
- B23D55/04C . . [N: for feeding work into engagement with the saw blade ([B23D53/06](#) takes precedence)]
- B23D55/06 . of drives for strap saw blades; of wheel mountings
- B23D55/06B . . [N: of wheels]
- B23D55/08 . of devices for guiding or feeding strap saw blades
- B23D55/08B . . [N: Devices for guiding strap saw blades]
- B23D55/08B1 . . . [N: which automatically detect or correct band saw blade deflection]
- B23D55/08B2 . . . [N: with means for automatically adjusting the distance between the guides]
- B23D55/08C . . [N: Devices for feeding strap saw blades]
- B23D55/10 . of devices for tensioning strap saw blades ([B23D55/06](#) takes precedence; incorporated in the strap [B23D61/12](#))
- B23D57/00** **Sawing machines or sawing devices not covered by one of the preceding groups [B23D45/00](#) to [B23D55/00](#)**
- B23D57/00B . [N: using saw wires]
- B23D57/00B1 . . [N: hand-held or hand-operated]
- B23D57/00B2 . . [N: with a plurality of saw wires or saw wires having plural cutting zones]
- B23D57/00D . [N: Sawing machines or sawing devices working with saw wires, characterised only by constructional features of particular parts (**constructional features of these parts per se [B23Q](#)**)]
- B23D57/00D2 . . [N: of frames; of tables]
- B23D57/00D4 . . [N: of devices for feeding, conveying or clamping work] [C9610]
- B23D57/00D6 . . [N: of drives for saw wires; of wheel mountings; of wheels]
- B23D57/00D8 . . [N: of devices for guiding or feeding saw wires]
- B23D57/00D10 . . [N: of devices for tensioning saw wires]
- B23D57/00F . [N: Devices for converting any machine for sawing purposes] [N9610]
- B23D57/00W . [N: specially adapted for sawing under water or at places accessible with difficulty]
- B23D57/00Z . [N: dismountable, collapsible or transportable, e.g. by means of a carrying case]
- B23D57/02 . with chain saws
- B23D57/02B . . [N: hand-held or hand-operated]

- B23D57/02P . . [N: with a plurality of saw chains]
- B23D59/00** **Accessories specially designed for sawing machines or sawing devices (lubricating or cooling machine tools in general [B23Q11/12](#))**
- B23D59/00B . [N: Measuring or control devices, e.g. for automatic control of work feed pressure on band saw blade (measuring in general [G01](#); controlling in general [G05](#))]
- B23D59/00B1 . . [N: for the position of the saw blade ([B27B5/36](#) and [B27B9/02](#) take precedence)]
- B23D59/00B1A . . . [N: Indicating the cutting plane on the workpiece, e.g. by projecting a laser beam] [N1201]
- B23D59/00B2 . . [N: for preventing collision of saw blades with other machine parts or workpieces]
- B23D59/00C . [N: for removing or collecting chips]
- B23D59/00D . [N: for mounting a portable sawing device on a frame part]
- B23D59/00Z . [N: comprising computers]
- B23D59/02 . Devices for lubricating or cooling circular saw blades
- B23D59/02B . . [N: the lubricating or cooling medium being applied through the mounting means of the tool, e.g. the tool spindle or hub]
- B23D59/04 . Devices for lubricating or cooling straight or strap saw blades
- B23D61/00** **Tools for sawing machines or sawing devices (tools for trepanning [B23B51/04](#)); Clamping devices for these tools**
- B23D61/00B . [N: Rotary saws comprising an essentially cylindrical body having cutting teeth arranged on its surface]
- B23D61/00D . [N: Oscillating saw blades] [N1201]
- B23D61/02 . Circular saw blades
- B23D61/02B . . [N: Types of set; Variable teeth, e.g. variable in height or gullet depth: Varying pitch; Details of gullet]
- B23D61/02C . . [N: with inserted segments having more than one tooth]
- B23D61/02D . . [N: Details of saw blade body]
- B23D61/02D2 . . . [N: Composite body, e.g. laminated, body of diverse material]
- B23D61/02M . . [N: of special material]
- B23D61/04 . . with inserted saw teeth [N: the teeth being individually inserted]
- B23D61/06 . . . in exchangeable arrangement
- B23D61/06B [N: Adjustable teeth]
- B23D61/08 . . Ring saw blades with internal saw teeth
- B23D61/10 . . clamped between hubs; Clamping or aligning devices therefor
- B23D61/12 . Straight saw blades; Strap saw blades
- B23D61/12B . . [N: Types of set; Variable teeth, e.g. variable in height or gullet depth; Varying pitch; Details of gullet]

- B23D61/12C . . [N: with inserted segments having more than one tooth]
- B23D61/12D . . [N: Details of saw blade body]
- B23D61/12D2 . . . [N: Composite body, e.g. laminated, body of diverse material]
- B23D61/12E . . [N: having cutting teeth along both edges]
- B23D61/12M . . [N: of special material]
- B23D61/12S . . [N: Sabre saw blades]
- B23D61/14 . . with inserted saw teeth, [N: i.e. the teeth being individually inserted]
- B23D61/16 . . . in exchangeable arrangement

- B23D61/18 . Sawing tools of special type, e.g. wire saw strands, saw blades or saw wire equipped with diamonds or other abrasive particles in selected individual positions [N: (cut-off wheels of bonded abrasive or with inserted abrasive blocks [B24D5/12](#))]
- B23D61/18B . . [N: Saw wires; Saw cables; Twisted saw strips]

- B23D63/00 Dressing the tools of sawing machines or sawing devices for use in cutting any kind of material, e.g. in the manufacture of sawing tools**

- B23D63/00B . [N: Devices for positioning the dressing tool with respect to the saw blade]
- B23D63/00C . [N: Saw clamping devices]
- B23D63/00I . [N: Workpiece indexing equipment specially adapted to form part of sawing tool dressing machines]
- B23D63/00S . [N: Saw teeth setting devices working with setting rollers]
- B23D63/00Z . [N: using computer control means] [N9807]
- B23D63/02 . Setting saw teeth by means of hand-operated [N: or foot-operated] devices [N: ([B23D63/00S](#) takes precedence)]
- B23D63/02B . . [N: Devices of the portable type carried by one hand and operable by one hand or two hands, e.g. having a pair of tongs]
- B23D63/02C . . [N: Foot-operated devices]
- B23D63/04 . Setting saw teeth of circular, straight, or strap saw blades by means of power-operated devices [N: ([B23D63/00S](#) takes precedence)]
- B23D63/06 . Upsetting the cutting edges of saw teeth, e.g. swaging
- B23D63/08 . Sharpening the cutting edges or saw teeth
- B23D63/10 . . by filing
- B23D63/10B . . . [N: sharpening circular saw blades]
- B23D63/12 . . by grinding
- B23D63/12B . . . [N: using two or more grinding wheels simultaneously]
- B23D63/12C . . . [N: the tool being a grinding worm]
- B23D63/14 . . . Sharpening circular saw blades
- B23D63/16 . . of chain saws (of mortise chain cutters [B24B3/14](#))
- B23D63/16B . . . [N: by a reciprocating or rotating rod-like sharpening tool, e.g. file, grinding]

- cylinder]
- B23D63/16D . . . [N: with tools that remain stationarily positioned during sharpening]
- B23D63/16E . . . [N: without removal of the saw chain from the guide bar ([B23D63/16B](#) takes precedence)]
- B23D63/16E2 [N: the saw chain moving around the guide bar]
- B23D63/18 . Straightening damaged saw blades; Reconditioning the side surface of saw blades, e.g. by grinding
- B23D63/20 . Combined processes for dressing saw teeth, e.g. both hardening and setting
- B23D63/20B . . [N: Combined setting and grinding]
- B23D63/20C . . [N: Combined setting and filing]
- B23D63/20D . . [N: Combined setting and upsetting]
- B23D63/20E . . [N: Combined upsetting and grinding]
- B23D63/20F . . [N: Combined upsetting and filing]
- B23D65/00** **Making tools for sawing machines or sawing devices for use in cutting any kind of material**
- B23D65/02 . Making saw teeth by punching, cutting, or planing
- B23D65/04 . Making saw teeth by milling
- Guide heading:** **Filing or rasping** ([sharpening saw teeth thereby B23D63/10](#))
- B23D67/00** **Filing or rasping machines of devices** ([securing arrangements for files or rasps B23D71/00](#))
- B23D67/02 . with reciprocating tools, mounted in a yoke or the like
- B23D67/04 . with reciprocating tools, attached to a carrier at one end only
- B23D67/06 . with rotating tools
- B23D67/08 . with tools moundted on an endless chain or belt
- B23D67/10 . for special use, e.g. for filing keys; Accessories therefor
- B23D67/12 . Hand-held or hand-operated filing or rasping devices ([hand files or rasps B23D71/04](#))
- B23D69/00** **Filing or rasping machines or devices. characterised only by constructional features of particular parts, e.g. guiding arrangements, drives** ([constructional features of these parts per se B23Q](#)); **Accessories for filing or rasping** ([attached to the tool B23D71/10](#))
- B23D69/02 . Guiding arrangements for hand tools
- B23D71/00** **Filing or rasping tools; Securing arrangements therefor** ([tool holders for machine tools B23Q3/00](#); [handles for hand implements B25G](#))

- B23D71/00B . [N: Rotary files]
- B23D71/02 . for filing or rasping machines or devices
- B23D71/02B . . [N: for rubber-like material]
- B23D71/04 . Hand files or hand rasps (carrying or attaching means for tools which are connected to a carrier at both ends [B23D51/12](#); guiding arrangements [B23D69/02](#))
- B23D71/06 . . using a single interchangeable blade
- B23D71/08 . . using a plurality of interchangeable cutting elements
- B23D71/10 . Accessories for filing or rasping tools, e.g. for preventing scoring of workpieces by the edges of the tool

B23D73/00 Making files or rasps

- B23D73/02 . Preliminary treatment of blanks, e.g. grinding, polishing, specially adapted for the manufacture of files or rasps
- B23D73/04 . Methods or machines for the manufacture of files or rasps (non-mechanical methods, see the relevant classes)
- B23D73/06 . . Cutting the working surfaces by means of chisels
- B23D73/08 . . Milling, planing, slotting, knurling, or broaching the working surfaces
- B23D73/10 . . Grinding the working surfaces
- B23D73/12 . . Peculiar procedures for sharpening or otherwise treating the working surfaces (special treatment by sand-blast [B24C1/02](#); sharpening files by etching [C23F1/06](#))
- B23D73/14 . Tools or accessories specially adapted for making files or rasps, e.g. chisels, supporting-frames

Guide heading: Reaming bored holes

B23D75/00 Reaming machines or reaming devices (tool holders for machine tools [B23Q3/00](#); handles for hand implements [B25G](#))

- B23D75/00B . [N: Hand-held or hand-operated reaming devices]

B23D77/00 Reaming tools

- B23D77/00B . [N: with means for preventing chatter]
- B23D77/00C . [N: with means for lubricating or cooling]
- B23D77/02 . Reamers with inserted cutting edges
- B23D77/02B . . [N: Securing arrangements for cutting inserts] [N9905]
- B23D77/04 . . with cutting edges adjustable to different diameters along the whole cutting length
- B23D77/04B . . . [N: by means of oblique planes] [N9905]

- B23D77/04C . . . [N: by means of screws] [N9905]
- B23D77/04D . . . [N: by means of radial cams] [N9905]
- B23D77/04F . . . [N: by means of conical screw threads] [N9905]

- B23D77/06 . Reaming with means for compensating wear ([B23D77/04](#) takes precedence)
- B23D77/08 . . by spreading slotted parts of the tool body
- B23D77/10 . . by expanding a tube-like non-slotted part of the tool body

- B23D77/12 . Reamers with cutting edges arranged in tapered form

- B23D77/14 . Reamers for special use, e.g. for working cylinder ridges

- B23D79/00** **Methods, machines, or devices not covered elsewhere, for working metal by removal of material** (by combined operations 81/00; cutting by electron-beam [B23K15/00](#), by laser beam [B23K26/00](#); by electro-erosion [B23H](#); tool holders for machine tools [B23Q3/00](#); handles for hand implements [B25G](#))

- B23D79/00B . [N: for thermal deburring ([B23D79/02B1B](#) takes precedence)]

- B23D79/02 . Machines or devices for scraping (turning-machines for bevelling, chamfering, or deburring the ends of bars or tubes [B23B5/16](#))
- B23D79/02B . . [N: for removing welding, brazing or soldering burrs, e.g. flash, on pipes or rods] [C9905]
- B23D79/02B1 . . . [N: internally]
- B23D79/02B1B [N: including other than cutting means, e.g. hot gas]
- B23D79/02C . . [N: for removing welding flashes on rails]
- B23D79/02D . . [N: for removing welding flashes on chain links] [N9905]
- B23D79/04 . . with rotating cutting-tool, e.g. for smoothing linings of bearings
- B23D79/06 . . with reciprocating cutting-tool
- B23D79/08 . . Hand scraping-implements
- B23D79/10 . . Accessories for holding scraping tools or work to be scraped

- B23D79/12 . Machines or devices for peeling bars or tubes making use of cutting bits arranged around the workpiece, otherwise than by turning (by turning [B23B5/12](#))

- B23D81/00** **Methods, machines, or devices for working metal, covered by more than one main group in this subclass** (in combination with other metal-working operations [B23P13/00](#), [B23D23/00](#))