

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SHAPING

B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR
(punching, perforating, making articles by processing sheet metal, tubes, or profiles [B21D](#); wire-working [B21F](#); making pins, needles, or nails [B21G](#); making chains [B21L](#); grinding [B24](#))
(NOTES omitted)

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](#))

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Planing; Slotting

1/00 Planing or slotting machines cutting by relative movement of the tool and workpiece in a horizontal straight line only

1/003 . {for planing elongated workpieces}

1/006 . . {Rails}

1/02 . by movement of the work-support

1/04 . . with the tool supported only on one side of the bed

1/06 . . with the tool supported on both sides of the bed

1/08 . by movement of the tool

1/10 . . with means for adjusting the tool-guide vertically

1/12 . . . with the tool supported only on one side of the bed

1/14 . . . with the tool supported on both sides of the bed

1/16 . . without means for adjusting the tool-guide vertically

1/18 . cutting on both the forward and the return stroke

1/20 . with tool-supports or work-supports specially mounted or guided for working in different directions or at different angles; Special purpose machines

1/205 . . {Planing nuts, bolt heads or other prismatic workpieces}

1/22 . . for planing ingots or the like (scrubbing or peeling ingots by milling [B23C 3/14](#))

1/24 . . for planing inner surfaces, e.g. of moulds

1/26 . . for planing edges or ridges or cutting grooves (cutting helical grooves [B23D 5/02](#))

1/28 . . in which the tool or workpiece is fed otherwise than in a straight line, e.g. for planing profiled stock

1/30 . . . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q 35/00](#))

3/00 Planing or slotting machines cutting by relative movement of the tool and workpiece in a vertical or inclined straight line

3/02 . for cutting grooves (cutting helical grooves [B23D 5/02](#))

3/04 . in which the tool or workpiece is fed otherwise than in a straight line

3/06 . . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q 35/00](#))

5/00 Planing or slotting machines cutting otherwise than by relative movement of the tool and workpiece in a straight line

5/02 . involving rotary and straight-line movements only, e.g. for cutting helical grooves

5/04 . controlled by a copying device, e.g. by a pattern (features of copying devices [B23Q 35/00](#))

7/00 Planing or slotting machines characterised only by constructional features of particular parts (constructional features of these parts per se [B23Q](#))

7/02 . of frames; of work-table beds

7/04 . of pillars, of cross-beams

7/06 . of tool-carrying arrangements

7/08 . of work-tables

7/10 . of drives for reciprocating parts

7/105 . . {hydraulically driven}

7/12 . of arrangements for impact damping or regenerating energy

9/00 Hand-operated planing devices; Portable planing apparatus

11/00 Planing or slotting devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool

| | | | |
|----------------------------------|--|--------------|---|
| 13/00 | Tools or tool holders specially designed for planing or slotting machines (features applicable also to turning-machines B23B 27/00 , B23B 29/00 ; for cutting gear teeth B23F 21/04) | 21/06 | • Hand-operated tube-cutters |
| | | 21/08 | • • with cutting wheels |
| | | 21/10 | • • with other cutting blades or tools |
| 13/005 | • {Tools or tool holders adapted to operate in both the forward and return stroke} | 21/12 | • • • with provision for hammering on the tool |
| 13/02 | • Pivotaly-mounted holders | 21/14 | • cutting inside the tube |
| 13/04 | • Holders for tool sets | 21/145 | • • {hand operated} |
| 13/06 | • Devices for lifting or lowering the tool | | |
| Shearing; Similar cutting | | 23/00 | Machines or devices for shearing or cutting profiled stock (hand-held devices B23D 29/00) |
| 15/00 | Shearing machines or shearing devices cutting by blades which move parallel to themselves | 2023/005 | • {for window coverings} |
| 15/002 | • {for cutting in more than one direction, e.g. angle cutting} | 23/02 | • otherwise than in a plane perpendicular to the axis of the stock |
| 15/005 | • {for bias cutting of webs or sheets} | 23/04 | • by means of holding-dies, arranged side by side, subjecting the stock to torsional stress |
| 2015/007 | • {reciprocating horizontally} | 25/00 | 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 B21C 47/10) |
| 15/02 | • having both upper and lower moving blades | 25/02 | • Flying shearing machines (B23D 25/12 takes precedence) |
| 15/04 | • having only one moving blade | 25/04 | • • in which a cutting unit moves bodily with the work while cutting (B23D 25/06 takes precedence) |
| 15/06 | • Sheet shears ({ B23D 15/002 and B23D 15/005 take precedence}) | 25/06 | • • having a cutting device mounted on an oscillating lever |
| 15/08 | • • with a blade moved in one plane, e.g. perpendicular to the surface of the sheet | 25/08 | • • having two coacting shearing blades mounted independently |
| 15/10 | • • with a blade moved in a curved surface, e.g. for producing an edge with a curved cross-section | 25/10 | • • • on co-operating beams moving parallel to each other and attached to lever mechanisms |
| 15/12 | • characterised by drives or gearings therefor | 25/12 | • Shearing machines with blades on coacting rotating drums |
| 15/14 | • • actuated by fluid or gas pressure | 25/14 | • without regard to the exact dimensions of the resulting material, e.g. for cutting-up scrap |
| 15/145 | • • • {actuated by explosion} | | |
| 17/00 | Shearing machines or shearing devices cutting by blades pivoted on a single axis (on an axis parallel to the blade B23D 15/10 ; hand-held devices B23D 29/00) | 27/00 | Machines or devices for cutting by a nibbling action |
| 17/02 | • characterised by drives or gearings therefor | 27/02 | • Hand-held devices |
| 17/04 | • • actuated by a rotary shaft | 27/04 | • • actuated by electric power |
| 17/06 | • • actuated by fluid or gas pressure | 27/06 | • • actuated by fluid or gas pressure |
| 17/08 | • • actuated by hand or foot operated lever mechanism | 29/00 | Hand-held metal-shearing or metal-cutting devices (with nibbling action B23D 27/02 ; hand-operated devices for metal-cutting otherwise than by shearing B26B) |
| 19/00 | Shearing machines or shearing devices cutting by rotary discs (by friction saw-discs B23D 45/00) | 29/002 | • {for cutting wire or the like} |
| 19/02 | • having both a fixed shearing blade and a rotary shearing disc | 29/005 | • {for cutting sheets} |
| 19/04 | • having rotary shearing discs arranged in co-operating pairs | 29/007 | • {for splitting nuts (hand operated tools with cutting action actuated by muscle power B26B 17/003)} |
| 19/06 | • • with several spaced pairs of shearing discs working simultaneously, e.g. for trimming or making strips | 29/02 | • Hand-operated metal-shearing devices |
| 19/065 | • • • {for cutting along lines not parallel to the longitudinal direction of the material, e.g. oblique or zig-zag cutting} | 29/023 | • • {for cutting wires} |
| 19/08 | • for special use, e.g. for cutting curves, for chamfering edges | 29/026 | • • {for cutting sheets} |
| 21/00 | 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 B21D 24/16) | 31/00 | Shearing machines or shearing devices covered by none or more than one of the groups B23D 15/00 - B23D 29/00; Combinations of shearing machines |
| 21/003 | • {by tools working in different directions successively} | 31/001 | • {for trimming deep drawn products (combined with deep-drawing presses B21D 24/16)} |
| 21/006 | • {and sealing, crushing or chamfering the tubes} | 31/002 | • {Breaking machines, i.e. pre-cutting and subsequent breaking} |
| 21/02 | • otherwise than in a plane perpendicular to the axis of the tube, e.g. for making mitred cuts, for making bicycle frames | 31/003 | • • {for rings} |
| 21/04 | • Tube-severing machines with rotating tool-carrier | 2031/005 | • • • {Cap holders therefor} |
| | | 2031/006 | • • • {for gangs} |
| | | 2031/007 | • • {for journals} |

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|--------------|--|--|--|
| 31/008 | <ul style="list-style-type: none"> • {Cutting-up scrap (disintegrating by knives in general B02C 18/00; cutting-up scrap while the material is travelling otherwise than in the direction of the cut B23D 25/14)} | 36/0091 | <ul style="list-style-type: none"> • {for machines with more than one cutting, shearing, or sawing devices} |
| 31/02 | <ul style="list-style-type: none"> • for performing different cutting operations on travelling stock, e.g. slitting and severing simultaneously | | NOTE |
| 31/04 | <ul style="list-style-type: none"> • for trimming stock combined with devices for shredding scrap | | Broaching |
| 33/00 | Accessories for shearing machines or shearing devices (feeding stock to machines or removing stock B21D 43/00) | 37/00 | Broaching machines or broaching devices |
| 33/003 | <ul style="list-style-type: none"> • {for obtaining pieces of a predetermined weight or volume, e.g. control arrangements (B23D 36/0025 takes precedence)} | 37/005 | <ul style="list-style-type: none"> • {for cylindrical workpieces, e.g. crankshafts (takes precedence over other subgroups)} |
| 33/006 | <ul style="list-style-type: none"> • {for obtaining pieces of a predetermined length, e.g. control arrangements (B23D 36/0033 takes precedence)} | 37/02 | <ul style="list-style-type: none"> • Broaching machines with horizontally-arranged working tools |
| 33/02 | <ul style="list-style-type: none"> • Arrangements for holding, guiding, and/or feeding work during the operation | 37/04 | <ul style="list-style-type: none"> • . for broaching inner surfaces |
| 33/025 | <ul style="list-style-type: none"> • . {Guillotines with holding means behind the knives} | 37/06 | <ul style="list-style-type: none"> • . for broaching outer surfaces |
| 33/04 | <ul style="list-style-type: none"> • . for making circular cuts | 37/08 | <ul style="list-style-type: none"> • Broaching machines with vertically-arranged working tools |
| 33/06 | <ul style="list-style-type: none"> • . in which the direction of feed is controlled by a copying device, e.g. by a pattern (features of copying devices B23Q 35/00) | 37/10 | <ul style="list-style-type: none"> • . for broaching inner surfaces |
| 33/08 | <ul style="list-style-type: none"> • Press-pads; Counter-bases; Hold-down devices | 37/12 | <ul style="list-style-type: none"> • . for broaching outer surfaces |
| 33/10 | <ul style="list-style-type: none"> • Stops for positioning work | 37/14 | <ul style="list-style-type: none"> • Broaching machines with rotatably-arranged working tools |
| 33/12 | <ul style="list-style-type: none"> • Equipment for indicating where to cut | 37/16 | <ul style="list-style-type: none"> • . for broaching helical grooves |
| 35/00 | Tools for shearing machines or shearing devices; Holders or chucks for shearing tools | 37/18 | <ul style="list-style-type: none"> • Broaching machines with working tools mounted on an endless chain or belt |
| 35/001 | <ul style="list-style-type: none"> • {cutting members} | 37/20 | <ul style="list-style-type: none"> • Broaching machines with arrangements for working in opposite directions |
| 35/002 | <ul style="list-style-type: none"> • {Means for mounting the cutting members} | 37/22 | <ul style="list-style-type: none"> • for special purposes (B23D 37/14 takes precedence) |
| 35/004 | <ul style="list-style-type: none"> • . {for circular cutting members} | 39/00 | Accessories for broaching machines or broaching devices |
| 35/005 | <ul style="list-style-type: none"> • {Adjusting the position of the cutting members} | 41/00 | Broaching machines or broaching devices characterised only by constructional features of particular parts (constructional features of these parts per se B23Q) |
| 35/007 | <ul style="list-style-type: none"> • . {for circular cutting members} | 41/02 | <ul style="list-style-type: none"> • of frames; of work supports |
| 35/008 | <ul style="list-style-type: none"> • {Means for changing the cutting members (mounting per se B23D 35/002)} | 41/04 | <ul style="list-style-type: none"> • of tool-carrying arrangements |
| 36/00 | 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 | 41/06 | <ul style="list-style-type: none"> • of devices for feeding, clamping, or ejecting workpieces |
| 36/0008 | <ul style="list-style-type: none"> • {for machines with only one cutting, sawing, or shearing devices} | 41/08 | <ul style="list-style-type: none"> • of drives; of control devices |
| 36/0016 | <ul style="list-style-type: none"> • . {for minimising waste} | 41/083 | <ul style="list-style-type: none"> • . {Hydraulic drives} |
| 36/0025 | <ul style="list-style-type: none"> • . {for obtaining pieces of a predetermined weight or volume} | 41/086 | <ul style="list-style-type: none"> • . {Control devices} |
| 36/0033 | <ul style="list-style-type: none"> • . {for obtaining pieces of a predetermined length} | 43/00 | Broaching tools (for cutting gear teeth B23F 21/26) |
| 36/0041 | <ul style="list-style-type: none"> • . {the tool moving continuously} | 43/005 | <ul style="list-style-type: none"> • {for cutting helical grooves} |
| 36/005 | <ul style="list-style-type: none"> • . {and taking account of marks, e.g. on the stock} | 43/02 | <ul style="list-style-type: none"> • for cutting by rectilinear movement (B23D 43/08 takes precedence) |
| 36/0058 | <ul style="list-style-type: none"> • . {the tool stopping for a considerable time after each cutting operation} | 2043/025 | <ul style="list-style-type: none"> • . {for producing grooves in turbines, e.g. for the insertion of blades} |
| 36/0066 | <ul style="list-style-type: none"> • . {and taking account of marks, e.g. on the stock} | 43/04 | <ul style="list-style-type: none"> • . having inserted cutting edges |
| 36/0075 | <ul style="list-style-type: none"> • . {and taking account of the temperature of the stock} | 43/06 | <ul style="list-style-type: none"> • for cutting by rotational movement |
| 36/0083 | <ul style="list-style-type: none"> • . {for cutting off of the ends of the products, e.g. cropping shears} | 2043/063 | <ul style="list-style-type: none"> • . {with cutters mounted externally} |
| | | 2043/066 | <ul style="list-style-type: none"> • . {with cutters mounted internally} |
| | | 43/08 | <ul style="list-style-type: none"> • mounted on an endless chain or belt |
| | | Sawing (surgical saws A61B 17/14 ; sawing wood or similar material B27B ; sawing stone B28D 1/02) | |
| | | 45/00 | Sawing machines or sawing devices with circular saw blades or with friction saw discs (shearing machines with rotary discs B23D 19/00 - B23D 25/00) |
| | | 45/003 | <ul style="list-style-type: none"> • {for particular purposes} |
| | | 45/006 | <ul style="list-style-type: none"> • {with means to attach the sawing device to the workpiece} |
| | | 45/02 | <ul style="list-style-type: none"> • with a circular saw blade or the stock mounted on a carriage |

- 45/021 . . {with the saw blade mounted on a carriage
([B23D 45/06](#), [B23D 45/046](#) take precedence)}
- 45/022 . . . {the carriage performing a vertical movement only}
- 45/024 . . . {the saw blade being adjustable according to depth or angle of cut ([B23D 45/022](#) takes precedence)}
- 45/025 {Radial sawing machines}
- 45/027 . . . {the saw carriage being mounted on a carriage, e.g. gantry-type sawing machines}
- 45/028 . . . {the saw carriage being mounted on a pivoted lever}
- 45/04 . . with a circular saw blade or the stock carried by a pivoted lever
- 45/042 . . {with the saw blade carried by a pivoted lever
([B23D 45/028](#), [B23D 45/065](#) take precedence)}
- 45/044 . . . {the saw blade being adjustable according to angle of cut ([B23D 45/025](#) takes precedence)}
- 45/046 . . . {the pivoted lever being mounted on a carriage}
- 45/048 {the saw blade being adjustable according to angle of cut}
- 45/06 . . with a circular saw blade arranged underneath a stationary work-table
- 45/061 . . {the saw blade being mounted on a carriage}
- 45/062 . . . {the saw blade being adjustable according to depth or angle of cut}
- 45/063 . . . {the carriage performing a vertical movement only}
- 45/065 . . {with the saw blade carried by a pivoted lever}
- 45/066 . . . {the pivoted lever being mounted on a carriage}
- 45/067 . . . {the saw blade being adjustable according to depth or angle of cut}
- 45/068 . . {the saw blade being adjustable according to depth or angle of cut ([B23D 45/061](#), [B23D 45/065](#) take precedence)}
- 45/08 . . with a ring blade having inside saw teeth
- 45/10 . . with a plurality of circular saw blades
([B23D 45/143](#), [B23D 45/165](#) take precedence)}
- 45/102 . . {some of which turn about perpendicular axes
([B23D 45/143](#) takes precedence)}
- 45/105 . . {operating within the same plane}
- 45/107 . . {mounted on a turret}
- 45/12 . . with a circular saw blade for cutting tubes
- 45/122 . . {for cutting slots in tubes}
- 45/124 . . {the workpieces turning about their longitudinal axis during the cutting operations}
- 45/126 . . {with the tool turning around the workpieces}
- 45/128 . . {with the tool introduced into the tubes and cutting from the inside outwards}
- 45/14 . . for cutting otherwise than in a plane perpendicular to the axis of the stock, e.g. for making a mitred cut
- 45/143 . . {with a plurality of circular saw blades}
- 45/146 . . . {the saw blades being angularly fixed}
- 45/16 . . Hand-held sawing devices with circular saw blades
- 45/165 . . {with a plurality of saw blades or saw blades having plural cutting zones}
- 45/18 . . 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 B23D 36/00](#))
- 45/20 . . Flying sawing machines, the saw carrier of which is reciprocated in a guide and moves with the travelling stock during sawing
- 45/22 . . Flying sawing machines with lever-supported saw carrier which moves in a complete circular path
- 45/24 . . Flying sawing machines with lever-supported saw carrier which oscillates in an arc
- 45/26 . . with high-speed cutting discs, performing the cut by frictional heat melting the material ([grinders for cutting-off B24B 27/06](#))
- 47/00** **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 B25F 5/00](#))
- 47/005 . . {Vibration-damping}
- 47/02 . . of frames; of guiding arrangements for work-table or saw-carrier
- 47/025 . . . {of tables}
- 47/04 . . of devices for feeding, positioning, clamping, or rotating work
- 47/042 . . {for conveying work to, or discharging work from, the machine}
- 47/045 . . {feeding work into engagement with the saw blade}
- 47/047 . . . {the work being mounted on rotating work support}
- 47/06 . . for stock of indefinite length
- 47/065 . . . {for laterally feeding long workpieces}
- 47/08 . . of devices for bringing the circular saw blade to the workpiece or removing same therefrom
- 47/10 . . actuated by fluid or gas pressure
- 47/12 . . of drives for circular saw blades
- 47/123 . . {acting on the disc of the saw blade}
- 47/126 . . {Angle drives}
- 49/00** **Machines or devices for sawing with straight reciprocating saw blades, e.g. hacksaws**
- 49/001 . . {transportable, e.g. fitted with wheels}
- 49/002 . . {with means to attach the sawing device to the work}
- 49/003 . . {having a plurality of saw blades or saw blades having plural cutting zones}
- 49/005 . . {with opposed saw blades}
- 49/006 . . {with contiguous, oppositely reciprocating saw blades}
- 49/007 . . {Jig saws, i.e. machine saws with a vertically reciprocating narrow saw blade chucked at both ends for contour cutting}
- 49/008 . . {hand-driven or foot-driven}
- 49/02 . . 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
- 49/04 . . Hacksaw machines with straight saw blades secured to a pivotally-arranged frame
- 49/06 . . Hacksaw machines with straight saw blades for special use
- 49/08 . . Pad-saw machines, i.e. machines in which the blade is attached to a carrier at one end only
- 49/10 . . Hand-held or hand-operated sawing devices with straight saw blades
- 49/105 . . {with means for guiding the sawing device}

- 49/11 . . for special purposes, e.g. offset-blade hand;
{Hand saws having spaced blades; Hand saws for
sawing grooves or square holes}
- 49/12 . . Hacksaws ([B23D 49/11](#), [B23D 49/16](#) take
precedence; bows adjustable in length or height
[B23D 51/12](#))
- 49/125 . . . {with wire-type frames}
- 49/14 . . Pad saws {([B23D 49/105](#), [B23D 49/11](#),
[B23D 49/16](#) take precedence)}
- 49/16 . . actuated by electric or magnetic power or prime
movers ([B23D 49/11](#) takes precedence)
- 49/162 . . . {Pad sawing devices}
- 49/165 {with means to move the saw blades in an
orbital path}
- 49/167 {with means to adjust the guide plate or with
means to adjust the plane in which the saw
blade moves}
- 51/00** **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 [B25F 5/00](#)); Carrying or
attaching means for tools, covered by this subclass,
which are connected to a carrier at both ends
- 51/005 . {Devices for moving the tool to the workpiece}
- 51/01 . characterised by the handle
- 51/02 . of beds; of guiding arrangements for work-tables or
saw carriers; of frames
- 51/025 . . {of arrangements for guiding the saw blade}
- 51/03 . . with extensible or collapsible frames {; Frames
with spare blade storage means}
- 51/04 . of devices for feeding, positioning, clamping, or
rotating work
- 51/043 . . {for conveying work to, or discharging work
from, the machine}
- 51/046 . . {for feeding work into engagement with the saw
blade, e.g. rotating work while sawing}
- 51/06 . . for stock of indefinite length
- 51/065 . . . {for laterally feeding long workpieces}
- 51/08 . of devices for mounting straight saw blades or other
tools
- 51/10 . . for hand-held or hand-operated devices
- 51/12 . . 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
- 51/125 . . . {Blade tensioning means}
- 51/14 . . . Attachment of the tool
- 51/16 . of drives or feed mechanisms for straight tools, e.g.
saw blades, or bows
- 51/163 . . {Vibratory electromagnetic drives therefor}
- 51/166 . . {Devices for arresting movement of the saw
blades ([B23D 51/20](#) takes precedence)}
- 51/18 . . actuated by fluid or gas pressure ([B23D 51/20](#)
takes precedence)
- 51/20 . . with controlled feed of the tool, or with special
arrangements for relieving or lifting the tool on
the return stroke
- 53/00** **Machines or devices for sawing with strap saw-
blades which are effectively endless in use, e.g. for
contour cutting**
- 53/001 . {transportable, e.g. fitted with wheels}
- 53/003 . {with means to attach the sawing device to the
workpiece}
- 53/005 . {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 [B27B 15/08](#))}
- 53/006 . {Convertible sawing devices}
- 53/008 . {Open-end band saws}
- 53/02 . with stationarily-mounted wheels, {i.e. during
sawing} carrying the strap ([B23D 53/06](#) takes
precedence)
- 53/023 . . {Arrangements for tilting the head carrying the
saw wheels}
- 53/026 . . {the band saw blade being guided in a horizontal
plane}
- 53/04 . with the wheels carrying the strap mounted shiftably
or swingingly {, i.e. during sawing}, other than
merely for adjustment
- 53/045 . . {with pivotably mounted head carrying the saw
wheels}
- 53/06 . with shiftable or swinging work-table
- 53/08 . for cutting profiled stock
- 53/10 . 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
- 53/12 . Hand-held or hand-operated sawing devices
working with strap saw blades
- 55/00** **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](#))
- 55/005 . {Devices for damping vibrations}
- 55/02 . of frames; of tables
- 55/023 . . {of tables ([B23D 53/06](#) takes precedence)}
- 55/026 . . . {the table being adjustable according to depth
or angle of cut}
- 55/04 . of devices for feeding or clamping work
- 55/043 . . {for conveying work to the sawing machine}
- 55/046 . . {for feeding work into engagement with the saw
blade ([B23D 53/06](#) takes precedence)}
- 55/06 . of drives for strap saw blades; of wheel mountings
- 55/065 . . {of wheels}
- 55/08 . of devices for guiding or feeding strap saw blades
- 55/082 . . {Devices for guiding strap saw blades}
- 55/084 . . . {which automatically detect or correct band
saw blade deflection}
- 55/086 . . . {with means for automatically adjusting the
distance between the guides}
- 55/088 . . {Devices for feeding strap saw blades}
- 55/10 . of devices for tensioning strap saw blades
([B23D 55/06](#) takes precedence; incorporated in the
strap [B23D 61/12](#))
- 57/00** **Sawing machines or sawing devices not
covered by one of the preceding groups**
[B23D 45/00](#) - [B23D 55/00](#)
- 57/0007 . {using saw wires}
- 57/0015 . . {hand-held or hand-operated}
- 57/0023 . . {with a plurality of saw wires or saw wires
having plural cutting zones}
- 57/003 . {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](#))}

- 57/0038 . . {of frames; of tables}
- 57/0046 . . {of devices for feeding, conveying or clamping work}
- 57/0053 . . {of drives for saw wires; of wheel mountings; of wheels}
- 57/0061 . . {of devices for guiding or feeding saw wires}
- 57/0069 . . {of devices for tensioning saw wires}
- 57/0076 . {Devices for converting any machine for sawing purposes}
- 57/0084 . {specially adapted for sawing under water or at places accessible with difficulty}
- 57/0092 . {dismountable, collapsible or transportable, e.g. by means of a carrying case}
- 57/02 . with chain saws
- 57/023 . . {hand-held or hand-operated}
- 57/026 . . {with a plurality of saw chains}
- 59/00 Accessories specially designed for sawing machines or sawing devices (lubricating or cooling machine tools in general [B23Q 11/12](#))**
- 59/001 . {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](#))}
- 59/002 . . {for the position of the saw blade ([B27B 5/36](#) and [B27B 9/02](#) take precedence)}
- 59/003 . . . {Indicating the cutting plane on the workpiece, e.g. by projecting a laser beam}
- 59/005 . . {for preventing collision of saw blades with other machine parts or workpieces}
- 59/006 . {for removing or collecting chips}
- 59/007 . {for mounting a portable sawing device on a frame part}
- 59/008 . {comprising computers}
- 59/02 . Devices for lubricating or cooling circular saw blades
- 59/025 . . {the lubricating or cooling medium being applied through the mounting means of the tool, e.g. the tool spindle or hub}
- 59/04 . Devices for lubricating or cooling straight or strap saw blades
- 61/00 Tools for sawing machines or sawing devices (tools for trepanning [B23B 51/04](#)); Clamping devices for these tools**
- 61/003 . {Rotary saws comprising an essentially cylindrical body having cutting teeth arranged on its surface}
- 61/006 . {Oscillating saw blades}
- 61/02 . Circular saw blades
- 61/021 . . {Types of set; Variable teeth, e.g. variable in height or gullet depth: Varying pitch; Details of gullet}
- 61/023 . . {with inserted segments having more than one tooth}
- 61/025 . . {Details of saw blade body}
- 61/026 . . . {Composite body, e.g. laminated, body of diverse material}
- 61/028 . . {of special material}
- 61/04 . . with inserted saw teeth {the teeth being individually inserted}
- 61/06 . . . in exchangeable arrangement
- 61/065 . . . {Adjustable teeth}
- 61/08 . . Ring saw blades with internal saw teeth
- 61/10 . . clamped between hubs; Clamping or aligning devices therefor
- 61/12 . Straight saw blades; Strap saw blades
- 61/121 . . {Types of set; Variable teeth, e.g. variable in height or gullet depth; Varying pitch; Details of gullet}
- 61/122 . . {with inserted segments having more than one tooth}
- 61/123 . . {Details of saw blade body}
- 61/125 . . . {Composite body, e.g. laminated, body of diverse material}
- 61/126 . . {having cutting teeth along both edges}
- 61/127 . . {of special material}
- 61/128 . . {Sabre saw blades}
- 61/14 . . with inserted saw teeth {, i.e. the teeth being individually inserted}
- 61/16 . . . in exchangeable arrangement
- 61/18 . 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 {(cut-off wheels of bonded abrasive or with inserted abrasive blocks [B24D 5/12](#))}
- 61/185 . . {Saw wires; Saw cables; Twisted saw strips}
- 63/00 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**
- 63/001 . {Devices for positioning the dressing tool with respect to the saw blade}
- 63/003 . {Saw clamping devices}
- 63/005 . {Workpiece indexing equipment specially adapted to form part of sawing tool dressing machines}
- 63/006 . {Saw teeth setting devices working with setting rollers}
- 63/008 . {using computer control means}
- 63/02 . Setting saw teeth by means of hand-operated {or foot-operated} devices {([B23D 63/006](#) takes precedence)}
- 63/023 . . {Devices of the portable type carried by one hand and operable by one hand or two hands, e.g. having a pair of tongs}
- 63/026 . . {Foot-operated devices}
- 63/04 . Setting saw teeth of circular, straight, or strap saw blades by means of power-operated devices {([B23D 63/006](#) takes precedence)}
- 63/06 . Upsetting the cutting edges of saw teeth, e.g. swaging
- 63/08 . Sharpening the cutting edges of saw teeth
- 63/10 . . by filing
- 63/105 . . . {sharpening circular saw blades}
- 63/12 . . by grinding
- 63/123 . . . {using two or more grinding wheels simultaneously}
- 63/126 . . . {the tool being a grinding worm}
- 63/14 . . . Sharpening circular saw blades
- 63/16 . . of chain saws (of mortise chain cutters [B24B 3/14](#))
- 63/162 . . . {by a reciprocating or rotating rod-like sharpening tool, e.g. file, grinding cylinder}
- 63/164 . . . {with tools that remain stationarily positioned during sharpening}
- 63/166 . . . {without removal of the saw chain from the guide bar ([B23D 63/162](#) takes precedence)}
- 63/168 {the saw chain moving around the guide bar}

- 63/18 . Straightening damaged saw blades; Reconditioning the side surface of saw blades, e.g. by grinding
- 63/20 . Combined processes for dressing saw teeth, e.g. both hardening and setting
- 63/201 . . {Combined setting and grinding}
- 63/203 . . {Combined setting and filing}
- 63/205 . . {Combined setting and upsetting}
- 63/206 . . {Combined upsetting and grinding}
- 63/208 . . {Combined upsetting and filing}
- 65/00 Making tools for sawing machines or sawing devices for use in cutting any kind of material**
- 65/02 . Making saw teeth by punching, cutting, or planing
- 65/04 . Making saw teeth by milling

Filing or rasping (sharpening saw teeth thereby [B23D 63/10](#))

- 67/00 Filing or rasping machines or devices (securing arrangements for files or rasps [B23D 71/00](#))**
- 67/02 . with reciprocating tools, mounted on a yoke or the like
- 67/04 . with reciprocating tools, attached to a carrier at one end only
- 67/06 . with rotating tools
- 67/08 . with tools mounted on an endless chain or belt
- 67/10 . for special use, e.g. for filing keys; Accessories therefor
- 67/12 . Hand-held or hand-operated filing or rasping devices ([hand files or rasps \[B23D 71/04\]\(#\)](#))
- 69/00 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 [B23D 71/10](#))**
- 69/02 . Guiding arrangements for hand tools
- 71/00 Filing or rasping tools; Securing arrangements therefor (tool holders for machine tools [B23Q 3/00](#); handles for hand implements [B25G](#))**
- 71/005 . {Rotary files}
- 71/02 . for filing or rasping machines or devices
- 71/025 . . {for rubber-like material}
- 71/04 . Hand files or hand rasps ([carrying or attaching means for tools which are connected to a carrier at both ends \[B23D 51/12\]\(#\)](#); [guiding arrangements \[B23D 69/02\]\(#\)](#))
- 71/06 . . using a single interchangeable blade
- 71/08 . . using a plurality of interchangeable cutting elements
- 71/10 . Accessories for filing or rasping tools, e.g. for preventing scoring of workpieces by the edges of the tool
- 73/00 Making files or rasps**
- 73/02 . Preliminary treatment of blanks, e.g. grinding, polishing, specially adapted for the manufacture of files or rasps
- 73/04 . Methods or machines for the manufacture of files or rasps ([non-mechanical methods, \[see the relevant classes\]\(#\)](#))
- 73/06 . . Cutting the working surfaces by means of chisels
- 73/08 . . Milling, planing, slotting, knurling, or broaching the working surfaces
- 73/10 . . Grinding the working surfaces

- 73/12 . . Peculiar procedures for sharpening or otherwise treating the working surfaces ([special treatment by sand-blast \[B24C 1/02\]\(#\)](#); [sharpening files by etching \[C23F 1/06\]\(#\)](#))
- 73/14 . Tools or accessories specially adapted for making files or rasps, e.g. chisels, supporting-frames

Reaming bored holes

- 75/00 Reaming machines or reaming devices (tool holders for machine tools [B23Q 3/00](#); handles for hand implements [B25G](#))**
- 75/005 . {Hand-held or hand-operated reaming devices}
- 77/00 Reaming tools**
- 77/003 . {with means for preventing chatter}
- 77/006 . {with means for lubricating or cooling}
- 77/02 . Reamers with inserted cutting edges
- 77/025 . . {Securing arrangements for cutting inserts}
- 77/04 . . with cutting edges adjustable to different diameters along the whole cutting length
- 77/042 . . . {by means of oblique planes}
- 77/044 . . . {by means of screws}
- 77/046 . . . {by means of radial cams}
- 77/048 . . . {by means of conical screw threads}
- 77/06 . Reaming with means for compensating wear ([B23D 77/04 takes precedence](#))
- 77/08 . . by spreading slotted parts of the tool body
- 77/10 . . by expanding a tube-like non-slotted part of the tool body
- 77/12 . Reamers with cutting edges arranged in tapered form
- 77/14 . Reamers for special use, e.g. for working cylinder ridges
- 79/00 Methods, machines, or devices not covered elsewhere, for working metal by removal of material (by combined operations [B23D 81/00](#); cutting by electron-beam [B23K 15/00](#), by laser beam [B23K 26/00](#); by electro-erosion [B23H](#); tool holders for machine tools [B23Q 3/00](#); handles for hand implements [B25G](#))**
- 79/005 . {for thermal deburring ([B23D 79/025 takes precedence](#))}
- 79/02 . Machines or devices for scraping ([turning-machines for bevelling, chamfering, or deburring the ends of bars or tubes \[B23B 5/16\]\(#\)](#))
- 79/021 . . {for removing welding, brazing or soldering burrs, e.g. flash, on pipes or rods}
- 79/023 . . . {internally}
- 79/025 {including other than cutting means, e.g. hot gas}
- 79/026 . . {for removing welding flashes on rails}
- 79/028 . . {for removing welding flashes on chain links}
- 79/04 . . with rotating cutting-tool, e.g. for smoothing linings of bearings
- 79/06 . . with reciprocating cutting-tool
- 79/08 . . Hand scraping-implements
- 79/10 . . Accessories for holding scraping tools or work to be scraped
- 79/12 . Machines or devices for peeling bars or tubes making use of cutting bits arranged around the workpiece, otherwise than by turning ([by turning \[B23B 5/12\]\(#\)](#))

81/00 **Methods, machines, or devices for working metal, covered by more than one main group in this subclass** (in combination with other metal-working operations [B23P 13/00](#), [B23D 23/00](#))

| | | |
|----------------|--|---|
| 2277/00 | Reaming tools | |
| 2277/02 | • Cutting head and shank made from two different components which are releasably or non-releasably attached to each other | 2277/2457 • • Elastomers, e.g. rubber |
| 2277/04 | • Cutting angles | 2277/2464 • • Hard metal, i.e. cemented carbide |
| 2277/06 | • Connections between component parts | 2277/2471 • • Steel |
| 2277/061 | • • Brazed connections | 2277/2478 • • • high speed steel |
| 2277/062 | • • Clamping the cutting insert or cutting bit by means of plastic deformation | 2277/2485 • • Titanium nitride |
| 2277/063 | • • Clamping the cutting insert or cutting bit using an elastically deformable clamping member | 2277/2492 • • Titanium carbide |
| 2277/064 | • • using a specially shaped fixation hole in the cutting insert or cutting bit | 2277/26 • Means for breaking chips |
| 2277/065 | • • Glued connections | 2277/28 • Chip collectors |
| 2277/066 | • • using a hollow screw, e.g. for the transmission of coolant | 2277/30 • Chip guiding means |
| 2277/067 | • • using heating and cooling, i.e. heat shrinking | 2277/32 • Details of the region preceding the axial cutting edge in the direction of feed |
| 2277/068 | • • using a groove in the top face of the cutting insert or bit engaged by a clamp | 2277/34 • comprising cutting inserts made from different materials |
| 2277/08 | • Adjustment mechanisms | 2277/36 • with the diameter of the tool decreasing in the direction of the shank from the cutting tip |
| 2277/081 | • • for axial adjustment of the cutting edge, cutting insert or cutting bit | 2277/38 • comprising eccentrics |
| 2277/083 | • • with means to prevent the user accessing the adjusting mechanism | 2277/40 • configured to ream an external surface |
| 2277/085 | • • comprising hydraulics | 2277/42 • comprising floating cutting heads |
| 2277/086 | • • comprising gears | 2277/44 • comprising chip grooves, i.e. flutes, of special form |
| 2277/088 | • • with an adjustment screw of special form | 2277/46 • Guiding pads |
| 2277/10 | • comprising means for damping of vibration, i.e. for reduction of chatter | 2277/48 • Guiding rollers |
| 2277/105 | • • with cutting edges located at unequal angles around the periphery of the tool | 2277/50 • configured as a hand tool |
| 2277/12 | • comprising balls | 2277/52 • Details of helices, e.g. helix angles or helices of special form |
| 2277/14 | • Means for burnishing | 2277/54 • comprising cutting inserts inclined in the axial plane |
| 2277/16 | • Use of centrifugal force to activate cutting means | 2277/56 • comprising an indication scale |
| 2277/20 | • Number of cutting edges | 2277/58 • Keys, e.g. spanners or allen keys, for assembling or disassembling the reaming tool |
| 2277/201 | • • One | 2277/60 • comprising means for lubrication or cooling |
| 2277/202 | • • Two | 2277/62 • Margins, i.e. the area on the circumference of the tool immediately behind the axial cutting edge |
| 2277/203 | • • Four | 2277/64 • Markings, letters or numbers |
| 2277/204 | • • Five | 2277/66 • Measurement of the tool or bore |
| 2277/205 | • • Six | 2277/68 • Pilots |
| 2277/206 | • • Eight | 2277/70 • Polygonal sections, e.g. for torque transmission between parts able to be uncoupled |
| 2277/207 | • • Nine | 2277/72 • comprising a body having a special profile, i.e. having a special cross section |
| 2277/208 | • • Ten | 2277/74 • comprising serrations |
| 2277/24 | • Materials of the tool or the intended workpiece, methods of applying these materials | 2277/76 • Shims |
| 2277/2407 | • • Applied by chemical vapour deposition [CVD] processes (coating by chemical vapour deposition in general C23C 16/00) | 2277/78 • for use with holes associated with spark plugs or glow plugs |
| 2277/2414 | • • Applied by physical vapour deposition [PVD] processes (coating by physical vapour deposition in general C23C 14/00) | 2277/80 • comprising a spring |
| 2277/2421 | • • Aluminium | 2277/82 • for producing a stepped bore |
| 2277/2428 | • • Ceramics, e.g. aluminium oxide or silicone nitride | 2277/84 • with tangentially mounted cutting inserts |
| 2277/2435 | • • Cubic boron nitride [CBN] | 2277/86 • comprising a thread |
| 2277/2442 | • • Diamond | |
| 2277/245 | • • • polycrystalline [PCD] | |