B23D PLANEING; 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)

**5/02** Planing or slotting machines cutting otherwise than by relative movement of the tool and workpiece in a straight line

**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)

**13/005** . [Tools or tool holders adapted to operate in both the forward and return stroke]

**13/02** . . Pivotedly-mounted holders

**13/04** . . Holders for tool sets
Planing; Slotting

Shearing: Similar cutting

15/00 Shearing machines or shearing devices cutting by blades which move parallel to themselves
15/02 (for cutting in more than one direction, e.g. angle cutting)
15/005 (for bias cutting of webs or sheets)
2015/007 (reciprocating horizontally)
15/02 having both upper and lower moving blades
15/04 having only one moving blade
15/06 Sheet shears (B23D 15/002 and B23D 15/005 take precedence)
15/08 with a blade moved in one plane, e.g. perpendicular to the surface of the sheet
15/10 with a blade moved in a curved surface, e.g. for producing an edge with a curved cross-section
15/12 characterised by drives or gearings therefor
15/14 actuated by fluid or gas pressure
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)
17/02 characterised by drives or gearings therefor
17/04 actuated by a rotary shaft
17/06 actuated by fluid or gas pressure
17/08 actuated by hand or foot operated lever mechanism

19/00 Shearing machines or shearing devices cutting by rotary discs (by friction saw-discs B23D 45/00)
19/02 having both a fixed shearing blade and a rotary shearing disc
19/04 having rotary shearing discs arranged in co-operating pairs
19/06 with several spaced pairs of shearing discs working simultaneously, e.g. for trimming or making strips
19/065 [for cutting along lines not parallel to the longitudinal direction of the material, e.g. oblique or zig-zag cutting]
19/08 for special use, e.g. for cutting curves, for chamfering edges

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)
21/003 [by tools working in different directions successively]
21/006 [and sealing, crushing or chamfering the tubes]
21/02 otherwise than in a plane perpendicular to the axis of the tube, e.g. for making mitred cuts, for making bicycle frames
21/04 Tube-severing machines with rotating tool-carrier
21/06 Hand-operated tube-cutters
21/08 with cutting wheels
21/10 with other cutting blades or tools
21/12 with provision for hammering on the tool
21/14 cutting inside the tube
21/145 [hand operated]

Machines or devices for shearing or cutting profiled stock (hand-held devices B23D 29/00)
23/00
23/005 [for window coverings]
23/02 otherwise than in a plane perpendicular to the axis of the stock
23/04 by means of holding-dies, arranged side by side, subjecting the stock to torsional stress

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)
25/00
25/02 Flying shearing machines (B23D 25/12 takes precedence)
25/04 in which a cutting unit moves bodily with the work while cutting (B23D 25/06 takes precedence)
25/06 having a cutting device mounted on an oscillating lever
25/08 having two coacting shearing blades mounted independently
25/10 on co-operating beams moving parallel to each other and attached to lever mechanisms
25/12 Shearing machines with blades on coacting rotating drums
25/14 without regard to the exact dimensions of the resulting material, e.g. for cutting-up scrap

Machines or devices for cutting by a nibbling action
27/00
27/02 Hand-held devices
27/04 actuated by electric power
27/06 actuated by fluid or gas pressure

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)
29/00
29/002 [for cutting wire or the like]
29/005 [for cutting sheets]
29/007 [for splitting nuts (hand operated tools with cutting action actuated by muscle power B26B 17/003)]
29/002 Hand-operated metal-shearing devices
29/0023 [for cutting wires]
29/0026 [for cutting sheets]

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
31/00
31/001 [for trimming deep drawn products (combined with deep-drawing presses B21D 24/16)]
31/002 [Breaking machines, i.e. pre-cutting and subsequent breaking]
31/003 [for rings]
31/005 [Cap holders therefor]
31/006 [for gangs]
31/007 [for journals]
31/008 [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)]
31/02 for performing different cutting operations on travelling stock, e.g. slitting and severing simultaneously
37/00 Broaching machines or broaching devices

37/005 . (for cylindrical workpieces, e.g. crankshafts (takes precedence over other subgroups))

37/02 . Broaching machines with horizontally-arranged working tools

37/04 . . for broaching inner surfaces

37/06 . . for broaching outer surfaces

37/08 . . Broaching machines with vertically-arranged working tools

37/10 . . for broaching inner surfaces

37/12 . . for broaching outer surfaces

37/14 . . Broaching machines with rotatably-arranged working tools

37/16 . . for broaching helical grooves

37/18 . . Broaching machines with working tools mounted on an endless chain or belt

37/20 . . Broaching machines with arrangements for working in opposite directions

37/22 . . for special purposes (B23D 37/14 takes precedence)

39/00 Accessories for broaching machines or broaching devices

41/00 Broaching machines or broaching devices characterised only by constructional features of particular parts (constructional features of these parts per se B23Q)

41/02 . . of frames; of work supports

41/04 . . of tool-carrying arrangements

41/06 . . of devices for feeding, clamping, or ejecting workpieces

41/08 . . of knives

41/083 . . . (for cutting helical grooves)

41/086 . . . (Control devices)

43/00 Brouching tools (for cutting gear teeth B23F 21/26)

43/005 . . for cutting helical grooves

43/02 . . for cutting by rectilinear movement (B23D 43/08 takes precedence)

2043/025 . . . (for producing grooves in turbines, e.g. for the insertion of blades)

43/04 . . having inserted cutting edges

43/06 . . for cutting by rotational movement

2043/063 . . . (with cutters mounted externally)

2043/066 . . . (with cutters mounted internally)

43/08 . . 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 . . (for particular purposes)

45/006 . . (with means to attach the sawing device to the workpiece)

45/02 . . 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]

NOTE

Broaching
Sawing

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)

47/00 . Vibration-damping

47/01 . of frames; of guiding arrangements for work-table or saw-carrier

47/02 . of devices for feeding, positioning, clamping, or rotating work

47/05 . for conveying work to, or discharging work from, the machine

47/04 . feeding work into engagement with the saw blade

47/06 . acting on the disc of the saw blade

47/07 . Angle drives

47/08 . for stock of indefinite length

47/09 . [for laterally feeding long workpieces]

47/10 . actuated by fluid or gas pressure

47/11 . of drives for circular saw blades

47/12 . [acting on the disc of the saw blade]

47/13 . [Angle drives]

47/14 . of devices for bringing the circular saw blade to the workpiece or removing same therefrom

47/15 . of means to attach the sawing device to the work

47/16 . having a plurality of saw blades or saw blades having plural cutting zones

47/17 . with opposed saw blades

47/18 . with contiguous, oppositely reciprocating saw blades

47/19 . Jig saws, i.e. machine saws with a vertically reciprocating narrow saw blade chucked at both ends for contour cutting

47/20 . hand-driven or foot-driven

47/21 . 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

47/22 . Hacksaw machines with straight saw blades secured to a pivotally-arranged frame

47/23 . Hacksaw machines with straight saw blades for special use

47/24 . Pad-saw machines, i.e. machines in which the blade is attached to a carrier at one end only

47/25 . Hand-held or hand-operated sawing devices with straight saw blades

47/26 . with means for guiding the sawing device

47/27 . for special purposes, e.g. offset-blade hand; Hand saws having spaced blades; Hand saws for sawing grooves or square holes

47/28 . Hand saws (B23D 49/11, B23D 49/16 take precedence; bows adjustable in length or height B23D 51/12)

47/29 . [with wire-type frames]

47/30 . Pad saws ((B23D 49/105, B23D 49/11, B23D 49/16 take precedence))
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 pivotedly mounted head carrying the saw wheels]
53/06 . . with tiltable or swingable 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

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, or discharging work from, the machine]
55/046 . . [of devices for feeding work into engagement with the saw blade, e.g. rotating work while sawing]
55/06 . . [for stock of indefinite length]
55/065 . . . [for laterally feeding long workpieces]
55/08 . . [of devices for mounting straight saw blades or other tools]
55/10 . . . [for hand-held or hand-operated devices]
55/12 . . . [of a tool to feed and withdraw the blade (B23D 51/20 takes precedence)]
55/125 . . . [Blade tensioning means]
55/14 . . . . Attachment of the tool
55/16 . . . . of drives or feed mechanisms for straight tools, e.g. saw blades, or bows
55/163 . . . . [Vibratory electromagnetic drives therefor]
55/166 . . . . [Devices for arresting movement of the saw blades (B23D 51/20 takes precedence)]
55/18 . . . . [for feeding work into engagement with the saw blade (B23D 51/20 takes precedence)]
55/20 . . . . 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]
Sawing

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}
63/002 . . . Setting saw teeth by means of hand-operated {or foot-operated} devices { (B23D 63/006 takes precedence) }
63/003 . . . {Saw teeth setting devices specifically adapted to form part of the portable type carried by one hand and operable by one hand or two hands, e.g. having a pair of tongs}
63/005 . . . {Foot-operated devices}
63/004 . . . Setting saw teeth of circular, straight, or strap saw blades by means of power-operated devices { (B23D 63/006 takes precedence) }
63/006 . . . {Upsetting the cutting edges of saw teeth, e.g. swaging}
63/008 . . . {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 stationary 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}
Sawing

63/028 . . (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

Filling or rasping (sharpening saw teeth thereby B23D 63/10)

67/00 Filling 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 filling or rasping devices (hand files or rasps B23D 71/04)

69/00 Filling 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 3/000; 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 3/000; 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)
2277/02. Cutting head and shank made from two different components which are releasably or non-releasably attached to each other.

2277/04. Cutting angles.

2277/06. Connections between component parts.

2277/08. Adjustments mechanisms.

2277/10. Cutting angles.

2277/12. Comprising balls.


2277/16. Use of centrifugal force to activate cutting means.

2277/20. Number of cutting edges.

2277/24. Materials of the tool or the intended workpiece, methods of applying these materials.


2277/32. Details of the region preceding the axial cutting edge in the direction of feed.

2277/34. Comprising cutting inserts made from different materials.

2277/36. With the diameter of the tool decreasing in the direction of the shank from the cutting tip.

2277/38. Comprising eccentrics.

2277/40. Configured to ream an external surface.

2277/42. Comprising floating cutting heads.

2277/44. Comprising chip grooves, i.e. flutes, of special form.

2277/46. Guiding pads.


2277/50. Configured as a hand tool.

2277/52. Details of helices, e.g. helix angles or helices of special form.

2277/54. Comprising cutting inserts inclined in the axial plane.

2277/56. Comprising an indication scale.

2277/58. Keys, e.g. spanners or allen keys, for assembling or disassembling the reaming tool.

2277/60. Comprising means for lubrication or cooling.

2277/62. Margins, i.e. the area on the circumference of the tool immediately behind the axial cutting edge.

2277/64. Markings, letters or numbers.

2277/66. Measurement of the tool or bore.

2277/68. Pilots.

2277/70. Polygonal sections, e.g. for torque transmission between parts able to be uncoupled.

2277/72. Comprising a body having a special profile, i.e. having a special cross section.

2277/74. Comprising serrations.

2277/76. Shims.

2277/78. For use with holes associated with spark plugs or glow plugs.

2277/80. Comprising a spring.

2277/82. For producing a stepped bore.

2277/84. With tangentially mounted cutting inserts.

2277/86. Comprising a thread.

Chip collectors.