CPC COOPERATIVE PATENT CLASSIFICATION

B23C MILLING (broaching B23D; broach-milling in making gears B23F; arrangement for copying or controlling B23Q)

B23C 1/00 **Milling machines not designed for particular work or special operations**

B23C 1/002 . {Gantry-type milling machines}

B23C 1/005 . {with a tool moving in a closed path around the workpiece}

B23C 1/007 . {movable milling machines, e.g. on rails}

B23C 1/02 . with one horizontal working-spindle

B23C 1/025 . . with working-spindle movable in a fixed position

B23C 1/027 . . with working-spindle movable in a vertical direction

B23C 1/04 . with a plurality of horizontal working-spindles

B23C 1/045 . . {Opposed - spindle machines}

B23C 1/06 . with one vertical working-spindle

B23C 1/08 . with a plurality of vertical working-spindles

B23C 1/10 . with both horizontal and vertical working-spindles

B23C 1/12 . with spindle adjustable to different angles, e.g. either horizontal or vertical

B23C 1/14 . with rotary work-carrying table (work tables for machine tools in general B23Q 1/00)

B23C 1/16 . specially designed for control by copying devices {(not used; see B23Q 35/00)}

B23C 1/18 . . for milling while revolving the work

B23C 1/20 . Portable devices or machines (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00); Hand-driven devices or machines

B23C 3/00 **Milling particular work; Special milling operations; Machines therefor** (milling gear-teeth B23F, {heat assisted machining B23P 25/00})

B23C 3/002 . {Milling elongated workpieces}

B23C 3/005 . . {Rails}

B23C 3/007 . {Milling end surfaces of nuts or tubes}

B23C 3/02 . Milling surfaces of revolution (B23C 3/06, B23C 3/08 take precedence)

B23C 3/023 . . {Milling spherical surfaces}

B23C 3/026 . . . {Milling balls}

B23C 3/04 . . while revolving the work

B23C 3/05 . . Finishing valves or valve seats {(machines for grinding seat surfaces, e.g. in valve housings, B24B 15/00)}

B23C 3/051 . . . {Reconditioning of valve seats}

B23C 3/053 . . . . {having means for guiding the tool carrying spindle}

B23C 3/055 . . . . . {for engines}

B23C 3/056 . . . . . {for taps or valves}

B23C 3/058 . . . {Reconditioning of valves}

B23C 3/06 . Milling crankshafts

B23C 3/08 . Milling cams, camshafts, or the like

B23C 3/10 . Relief milling (lathes or turning devices for relieving **B23B5/42**)

B23C 3/12 . Trimming or finishing edges, e.g. deburring welded corners

B23C 3/122 . . {of pipes or cylinders}

B23C 3/124 . . . {internally}

B23C 3/126 . . {Portable devices or machines for chamfering edges}

B23C 3/128 . . {Trimming or finishing edges of doors and windows}

B23C 3/13 . Surface milling of plates, sheets or strips

B23C 3/14 . Scrubbing or peeling ingots or similar work-pieces

B23C 3/16 . Working surfaces curved in two directions

B23C 3/18 . . for shaping screw-propellers, turbine blades, or impellers

B23C 3/20 . . for shaping dies

B23C 3/22 . Forming overlapped joints, e.g. of the ends of piston-rings

B23C 3/24 . Making square or polygonal ends on work-pieces, e.g. key studs on tools

B23C 3/26 . Making square or polygonal holes in work-pieces, e.g. key holes in tools

B23C 3/28 . Grooving workpieces (tread-cutting by milling B23G 1/32)

B23C 3/30 . . Milling straight grooves, e.g. keyways

B23C 3/305 . . . {in which more than one milling tool is used simultaneously, e.g. for sheet material}

B23C 3/32 . . Milling helical grooves, e.g. in making twist-drills

B23C 3/34 . . Milling grooves of other forms, e.g. circumferential

B23C 3/35 . . Milling grooves in keys

B23C 3/355 . . . {Holders for the template keys}

B23C 3/36 . Milling milling-cutters (B23C 3/28 takes precedence)

B23C 5/00 **Milling-cutters** (for cutting gear-teeth B23F 21/12)

B23C 5/003 . {with vibration suppressing means}

B23C 5/006 . {Details of the milling cutter body}

B23C 5/02 . characterised by the shape of the cutter

B23C 5/04 . . Plain cutters, i.e. having essentially a cylindrical or tapered cutting surface of substantial length (B23C 5/10 takes precedence)

B23C 5/06 . . Face-milling cutters, i.e. having only or primarily a substantially flat cutting surface

B23C 5/08 . . Disc-type cutters

B23C 5/10 . . Shank-type cutters, i.e. with an integral shaft

B23C 5/1009 . . . {Ball nose end mills}

B23C 5/1018 . . . . {with permanently fixed cutting inserts}

B23C 5/1027 . . . . {with one or more removable cutting inserts}

B23C 5/1036 . . . . . {having a single cutting insert, the cutting edges of which subtend 180 degrees}

B23C 5/1045 . . . . . {having a cutting insert, the cutting edge of which subtends substantially 90 degrees}

B23C 5/1054 . . . {T slot cutters}
B23C 5/1063 . . . . {with permanently fixed cutting inserts}
B23C 5/1072 . . . . {with removable cutting inserts}
B23C 5/1081 . . . {with permanently fixed cutting inserts (B23C 5/1054 and B23C 5/1081 take precedence)}
B23C 5/109 . . . {with removable cutting inserts}
B23C 5/12 . . Cutters specially designed for producing particular profiles (B23C 5/10 takes precedence)
B23C 5/14 . . . essentially comprising curves {(B23C 5/1009 takes precedence)}
B23C 5/16 . characterised by physical features other than shape
B23C 5/165 . . {with chipbreaking or chipdividing equipment (for turning machines B23B 25/02; turning tools B23B 27/00; drilling machines B23B 47/34)}
B23C 5/18 . . with permanently-fixed cutter-bits or teeth
B23C 5/20 . . with removable cutter bits or teeth {or cutting inserts}
B23C 5/202 . . . {Special by shaped plate-like cutting inserts, i.e. length greater than or equal to width, width greater than or equal to thickness (with removable plate-like turning cutting inserts of special form B23B 27/141)}
B23C 5/205 . . . . {having chip-breakers}
B23C 5/207 . . . . {having a special shape}
B23C 5/22 . . . Securing arrangements for bits or teeth {or cutting inserts}
B23C 5/2204 . . . . {with cutting inserts clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the insert}
B23C 5/2208 . . . . . {for plate-like cutting inserts (B23C 5/2226, B23C 5/223, B23C 5/2234 take precedence)}
B23C 5/2213 . . . . . {Special by shaped cutting inserts}
B23C 5/2217 . . . . . {having chip-breakers}
B23C 5/2221 . . . . . {having a special shape}
B23C 5/2226 . . . . . {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/223 . . . . . {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2234 . . . . . {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2239 . . . . {with cutting inserts clamped by a clamping member acting almost perpendicular on the cutting face}
B23C 5/2243 . . . . . {for plate-like cutting inserts (B23C 5/2252, B23C 5/2256, B23C 5/226 take precedence)}
B23C 5/2247 . . . . . {having a special shape}
B23C 5/2252 . . . . . {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2256 . . . . . {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/226 . . . . . {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2265 . . . . {by means of a wedge}
B23C 5/2269 . . . . . {for plate-like cutting inserts (B23C 5/2278, B23C 5/2286, B23C 5/2291 take precedence)}
B23C 5/2273 . . . . . {having a special shape}
B23C 5/2278 . . . . . {for plate-like cutting inserts fitted on an intermediate carrier}

B23C 5/2282 ..... {having a special shape}
B23C 5/2286 ..... {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2291 ..... {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2295 .... {the cutting elements being clamped simultaneously}
B23C 5/24 .... adjustable
B23C 5/2403 ..... {with cutting inserts clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the insert}
B23C 5/2406 ..... {for plate-like cutting inserts (B23C 5/241, B23C 5/2413, B23C 5/2417 take precedence)}
B23C 5/241 ..... {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2413 ..... {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2417 ..... {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/242 ..... {with cutting inserts clamped by a clamping member acting almost perpendicularly on the cutting face}
B23C 5/2424 ..... {for plate-like cutting inserts (B23C 5/2427, B23C 5/2431, B23C 5/2434 take precedence)}
B23C 5/2427 ..... {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2431 ..... {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2434 ..... {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2437 ..... {clamping by means of a wedge}
B23C 5/2441 ..... {for plate-like cutting inserts (B23C 5/2444, B23C 5/2448, B23C 5/2451 take precedence)}
B23C 5/2444 ..... {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2448 ..... {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2451 ..... {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2455 ..... {The adjusting means being serrated teeth on the cutter and the cutting insert}
B23C 5/2458 ..... {the cutting elements being clamped or adjusted simultaneously}
B23C 5/2462 ..... {the adjusting means being oblique surfaces}
B23C 5/2465 ..... {the adjusting means being notches}
B23C 5/2468 ..... {the adjusting means being serrations}
B23C 5/2472 ..... {the adjusting means being screws}
B23C 5/2475 ..... {the adjusting means being distance elements, e.g. shims or washers}
B23C 5/2479 ..... {the adjusting means being eccentrics}
B23C 5/2482 ..... {the adjusting means being hydraulic cylinders}
B23C 5/2486 ..... {where the adjustment is made by balancing the toolholders}
B23C 5/2489 ..... {where the adjustment is made by changing the inclination of the inserts}
B23C 5/2493 ..... {where the adjustment is made by deforming the seating surfaces}
B23C 5/2496 ..... {where the adjusting means are gears and racks}
B23C 5/26 . Securing milling cutters to the driving spindle
B23C 5/265 .. {by fluid pressure means}
B23C 5/28 . Features relating to lubricating or cooling

B23C 7/00 **Milling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool**

B23C 7/02 . to lathes

B23C 7/04 . to planing or slotting machines

B23C 9/00 **Details or accessories so far as specially adapted to milling machines or cutter** (drives, control devices, or accessories, in general B23Q)

B23C 9/005 . {milling heads}

B23C 2200/00 **Details of milling cutting inserts**

B23C 2200/04 . Overall shape

B23C 2200/0405 . . Hexagonal

B23C 2200/0411 . . . irregular

B23C 2200/0416 . . Irregular

B23C 2200/0422 . . Octagonal

B23C 2200/0427 . . . rounded

B23C 2200/0433 . . Parallelogram

B23C 2200/0438 . . . rounded

B23C 2200/0444 . . Pentagonal

B23C 2200/045 . . Round

B23C 2200/0455 . . Square

B23C 2200/0461 . . . rounded

B23C 2200/0466 . . Star form

B23C 2200/0472 . . Trapezium

B23C 2200/0477 . . Triangular

B23C 2200/0483 . . . rounded

B23C 2200/0488 . . Heptagonal

B23C 2200/0494 . . Rectangular

B23C 2200/08 . Rake or top surfaces

B23C 2200/081 . . with projections (chip breaking projections in general B23C 2200/323)

B23C 2200/082 . . with an elevated clamping surface

B23C 2200/083 . . curved

B23C 2200/085 . . discontinuous

B23C 2200/086 . . with one or more grooves

B23C 2200/087 . . . for chip-breaking (with chip-breaking grooves in general B23C 2200/326)

B23C 2200/088 . . spherical

B23C 2200/12 . Side or flank surfaces

B23C 2200/121 . . with projections

B23C 2200/123 . . curved

B23C 2200/125 . . discontinuous

B23C 2200/126 . . . stepped

B23C 2200/128 . . with one or more grooves
B23C 2200/16 . Supporting or bottom surfaces
B23C 2200/161 . . with projections
B23C 2200/162 . . curved
B23C 2200/164 . . discontinuous
B23C 2200/165 . . with one or more grooves
B23C 2200/167 . . star form
B23C 2200/168 . . with features related to indexing (with lines to permit indexing of round inserts B23C 2200/363)
B23C 2200/20 . Top or side views of the cutting edge
B23C 2200/201 . . Details of the nose radius and immediately surrounding areas
B23C 2200/203 . . Curved cutting edges
B23C 2200/205 . . Discontinuous cutting edges
B23C 2200/206 . . Cutting edges having a wave-form
B23C 2200/208 . . Wiper, i.e. an auxiliary cutting edge to improve surface finish
B23C 2200/24 . Cross section of the cutting edge
B23C 2200/243 . . bevelled or chamfered
B23C 2200/246 . . rounded
B23C 2200/28 . Angles
B23C 2200/283 . . Negative cutting angles
B23C 2200/286 . . Positive cutting angles
B23C 2200/32 . Chip breaking or chip evacuation
B23C 2200/323 . . by chip-breaking projections (with projection on top surface B23C 2200/081)
B23C 2200/326 . . by chip breaking grooves (with grooves on top surface for chip-breaking B23C 2200/087)
B23C 2200/36 . Other features of the milling insert not covered by B23C 2200/04 to B23C 2200/32
B23C 2200/361 . . Fixation holes
B23C 2200/362 . . . Having two fixation holes
B23C 2200/363 . . Lines to permit indexing of round insert (bottom surface with features relating to indexing B23C 2200/168)
B23C 2200/365 . . Lands, i.e. the outer peripheral section of rake faces
B23C 2200/366 . . . Variable
B23C 2200/367 . . Mounted tangentially, i.e. where the rake face is not the face with largest area
B23C 2200/368 . . Roughened surfaces

B23C 2210/00 Details of milling cutters

B23C 2210/02 . Connections between the shanks and detachable cutting heads
B23C 2210/03 . Cutting heads comprised of different material than the shank irrespective of whether the head is detachable from the shank
B23C 2210/04 . Angles
B23C 2210/0407 . . Cutting angles

B23C 2210/0414 . . . different
B23C 2210/0421 . . . negative
B23C 2210/0428 . . . . axial rake angle
B23C 2210/0435 . . . . radial rake angle
B23C 2210/0442 . . . positive
B23C 2210/045 . . . . axial rake angle
B23C 2210/0457 . . . . radial rake angle
B23C 2210/0464 . . . neutral
B23C 2210/0471 . . . . axial rake angle
B23C 2210/0478 . . . . radial rake angle
B23C 2210/0485 . . Helix angles
B23C 2210/0492 . . . different
B23C 2210/08 . Side or top views of the cutting edge
B23C 2210/082 . . Details of the corner region between axial and radial cutting edges
B23C 2210/084 . . Curved cutting edges
B23C 2210/086 . . Discontinuous or interrupted cutting edges
B23C 2210/088 . . Cutting edges with a wave form
B23C 2210/12 . Cross section of the cutting edge
B23C 2210/123 . . Bevelled cutting edges
B23C 2210/126 . . Rounded cutting edges
B23C 2210/16 . Fixation of inserts or cutting bits in the tool (details of connections B23C 2240/00)
B23C 2210/161 . . Elastically deformable clamping members
B23C 2210/163 . . Indexing
B23C 2210/165 . . Fixation bolts
B23C 2210/166 . . Shims
B23C 2210/168 . . Seats for cutting inserts, supports for replacable cutting bits
B23C 2210/20 . Number of cutting edges
B23C 2210/201 . . one
B23C 2210/202 . . three
B23C 2210/203 . . four
B23C 2210/204 . . five
B23C 2210/205 . . six
B23C 2210/206 . . seven
B23C 2210/207 . . eight
B23C 2210/208 . . ten
B23C 2210/209 . . twelve
B23C 2210/24 . Overall form of the milling cutter (angles B23C 2210/04; top or side views of cutting edges B23C 2210/08; cross sections of cutting edges B23C 2210/12)
B23C 2210/241 . . Cross sections of the whole milling cutter
B23C 2210/242 . . Form tools, i.e. cutting edges profiles to generate a particular form

B23C 2210/243 .. Cutting parts at both ends
B23C 2210/244 .. Milling cutters comprised of disc-shaped modules or multiple disc-like cutters
B23C 2210/245 .. Milling cutters comprising a disc having a wave form
B23C 2210/246 .. Milling cutters comprising a hole or hollow in the end face or between the cutting edges
B23C 2210/247 .. Stepped milling cutters
B23C 2210/248 ... with enlarged cutting heads
B23C 2210/28 . Arrangement of teeth
B23C 2210/282 .. Unequal angles between the cutting edges, i.e. cutting edges unequally spaced in the circumferential direction
B23C 2210/285 .. Cutting edges arranged at different diameters
B23C 2210/287 .. Cutting edges arranged at different axial positions or having different lengths in the axial direction
B23C 2210/32 . Details of teeth
B23C 2210/321 .. Lands, i.e. the area on the rake face in the immediate vicinity of the cutting edge
B23C 2210/323 .. Separate teeth, i.e. discrete profiled teeth similar to those of a hob
B23C 2210/325 .. Different teeth, i.e. one tooth having a different configuration to a tooth on the opposite side of the flute
B23C 2210/326 .. File like cutting teeth, e.g. the teeth of cutting burrs
B23C 2210/328 .. Treated cutting edges
B23C 2210/40 . Flutes, i.e. chip conveying grooves
B23C 2210/402 .. of variable depth
B23C 2210/405 ... having decreasing depth in the direction of the shank from the tip of the tool
B23C 2210/407 ... having increasing depth in the direction of the shank from the tip of the tool
B23C 2210/44 . Margins, i.e. the part of the peripheral suface immediately adacent the cutting edge
B23C 2210/445 .. variable
B23C 2210/48 . Chip breakers
B23C 2210/483 .. Chip breaking projections
B23C 2210/486 .. Chip breaking grooves or depressions
B23C 2210/50 . Cutting inserts
B23C 2210/503 .. mounted internally on the cutter
B23C 2210/506 .. mounted so as to be able to rotate freely
B23C 2210/52 . Bushings
B23C 2210/54 . Configuration of the cutting part
B23C 2210/56 . Supporting or guiding sections located on the periphery of the tool
B23C 2210/58 . Brushes
B23C 2210/60 . Axis of the cutter inclined with respect to the axis of rotation
B23C 2210/62 . Selectable cutting diameters
B23C 2210/64 . End milling cutters having a groove in the end cutting face, the groove not being present so as to provide a cutting edge
B23C 2210/66 . Markings, i.e. symbols or indicating marks

B23C 2210/68 . Reground to nominal diameter by removal of material from both the front of the insert and the back of insert carrier
B23C 2210/70 . Pilots
B23C 2210/72 . Rotatable in both directions
B23C 2210/74 . Slits

B23C 2215/00 Details of workpieces
B23C 2215/04 . Aircraft components
B23C 2215/045 . . Propellers
B23C 2215/08 . Automotive parts (B23C 2215/16, B23C 2215/20 and B23C 2215/24 take precedence)
B23C 2215/085 . . Wheels
B23C 2215/12 . Propellers for boats
B23C 2215/16 . Camshafts
B23C 2215/20 . Crankshafts
B23C 2215/24 . Components of internal combustion engines
B23C 2215/242 . . Combustion chambers
B23C 2215/245 . . Connecting rods
B23C 2215/247 . . Components of diesel engines
B23C 2215/28 . Nipples
B23C 2215/32 . Railway tracks
B23C 2215/36 . Railway wheels
B23C 2215/40 . Spectacles
B23C 2215/44 . Turbine blades
B23C 2215/48 . Kaplan turbines
B23C 2215/52 . Axial turbine wheels
B23C 2215/56 . Radial turbine wheels
B23C 2215/60 . Valve guides in combination with the neighbouring valve seat
B23C 2215/64 . Well pipe windows, i.e. windows in tubings or casings for wells

B23C 2220/00 Details of milling processes
B23C 2220/04 . Milling with the axis of the cutter inclined to the surface being machined
B23C 2220/08 . Milling with the axis of the tool perpendicular to the workpiece axis
B23C 2220/12 . Cutting off, i.e. producing multiple discrete components from a single piece of material
B23C 2220/16 . Chamferring
B23C 2220/20 . Deburring
B23C 2220/24 . Production of elliptical holes
B23C 2220/28 . Finishing (roughing and finishing B23C 2220/605)
B23C 2220/32 . Five-axis
B23C 2220/36 . Production of grooves
B23C 2220/363 . . Spiral grooves
B23C 2220/366 . . Turbine blade grooves

B23C 2220/40 . Using guiding means
B23C 2220/44 . High speed milling
B23C 2220/48 . Methods of milling not otherwise provided for
B23C 2220/52 . Orbital drilling, i.e. use of a milling cutter moved in a spiral path to produce a hole
B23C 2220/56 . Plunge milling
B23C 2220/60 . Roughing
B23C 2220/605 . . Roughing and finishing
B23C 2220/64 . Using an endmill, i.e. a shaft milling cutter, to generate profile of a crankshaft or camshaft
B23C 2220/68 . Whirling

B23C 2222/00 Materials of tools or workpieces composed of metals, alloys or metal matrices

B23C 2222/04 . Aluminium
B23C 2222/06 . Babbitt metal
B23C 2222/12 . Brass
B23C 2222/14 . Cast iron
B23C 2222/16 . Cermet
B23C 2222/28 . Details of hard metal, i.e. cemented carbide
B23C 2222/32 . Details of high speed steel (steel B23C 2222/84)
B23C 2222/52 . Magnesium
B23C 2222/61 . Metal matrices with metallic or non-metallic particles or fibres
B23C 2222/64 . Nickel
B23C 2222/76 . Silver
B23C 2222/78 . Sodium
B23C 2222/84 . Steel (details of high speed steel B23C 2222/32)
B23C 2222/88 . Titanium
B23C 2222/98 . Zinc

B23C 2224/00 Materials of tools or workpieces composed of a compound including a metal

B23C 2224/04 . Aluminium oxide
B23C 2224/13 . Chromium nitride
B23C 2224/14 . Chromium aluminium nitride (CrAlN)
B23C 2224/20 . Tantalum carbide
B23C 2224/22 . Titanium aluminium carbide nitride (TiAlCN)
B23C 2224/24 . Titanium aluminium nitride (TiAlN)
B23C 2224/28 . Titanium carbide
B23C 2224/32 . Titanium carbide nitride (TiCN)
B23C 2224/36 . Titanium nitride
B23C 2224/56 . Vanadium aluminium nitride (VAlN)

B23C 2226/00 Materials of tools or workpieces not comprising a metal

B23C 2226/12 . Boron nitride
B23C 2226/125 . . cubic (CBN)
B23C 2226/18 . Ceramic
B23C 2226/27 . Composites, e.g. fibre reinforced composites
B23C 2226/31 . Diamond
B23C 2226/315 . . polycrystalline (PCD)
B23C 2226/33 . Elastomers, e.g. rubber
B23C 2226/37 . Fibreglass
B23C 2226/41 . Gypsum
B23C 2226/42 . Gem, i.e. precious stone
B23C 2226/45 . Glass (milling glass B28D 1/18)
B23C 2226/54 . Paper
B23C 2226/61 . Plastics not otherwise provided for, e.g. nylon
B23C 2226/62 . Polystyrene foam
B23C 2226/72 . Silicon carbide
B23C 2226/73 . Silicon nitride
B23C 2226/75 . Stone, rock or concrete (milling stone or like materials B28D 1/18)

B23C 2228/00 **Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner**
B23C 2228/04 . applied by chemical vapour deposition (CVD)
B23C 2228/08 . applied by physical vapour deposition (PVD)
B23C 2228/10 . Coating
B23C 2228/12 . Cast, i.e. in the form of a casting
B23C 2228/14 . Flexible
B23C 2228/24 . Hard, i.e. after being hardened
B23C 2228/25 . Honeycomb
B23C 2228/26 . Hot
B23C 2228/49 . Sintered
B23C 2228/50 . Soft metal

B23C 2230/00 **Details of chip evacuation** (chip evacuation in cutting inserts B23C 2200/32)
B23C 2230/04 . Transport of chips
B23C 2230/045 . . to the middle of the cutter or in the middle of a hollow cutter
B23C 2230/08 . Using suction

B23C 2235/00 **Details of milling keys**
B23C 2235/04 . Keys with blind holes
B23C 2235/08 . Brushes
B23C 2235/12 . Using a database to store details of the key, the information in the database being used for the generation of the profile of the key
B23C 2235/16 . Dial indicators

B23C 2235/21 . Calibration by electronic detection of position of probes and cutting wheels
B23C 2235/24 . Electronic sensors
B23C 2235/28 . Key blanks
B23C 2235/32 . Measurement systems
B23C 2235/36 . Ring keys
B23C 2235/41 . Scanning systems
B23C 2235/44 . Templates for the simulation of keys
B23C 2235/48 . Tracers, probes or styli

B23C 2240/00 **Details of connections of tools or workpieces** (fixation of the cutting insert or bit in the tool B23C 2210/16)
B23C 2240/04 . Bayonet connections
B23C 2240/08 . Brazed connections
B23C 2240/12 . Connections using captive nuts
B23C 2240/16 . Welded connections
B23C 2240/21 . Glued connections
B23C 2240/24 . Connections using screws
B23C 2240/245 . . hollow screws, e.g. for the transmission of coolant
B23C 2240/32 . Connections using screw threads

B23C 2245/00 **Details of adjusting inserts or bits in the milling cutter**
B23C 2245/04 . Adjustable wedge surfaces
B23C 2245/08 . Setting gauges
B23C 2245/12 . Spiral discs

B23C 2250/00 **Compensating adverse effects during milling**
B23C 2250/04 . Balancing the cutter (vibration damping B23C 2250/16)
B23C 2250/08 . compensating centrifugal force
B23C 2250/12 . Cooling and lubrication
B23C 2250/16 . Damping vibrations (balancing B23C 2250/04)
B23C 2250/21 . compensating wear of parts not designed to be exchanged as wear parts

B23C 2255/00 **Regulation of depth of cut**
B23C 2255/04 . Depth indicators
B23C 2255/08 . Limitation of depth of cut
B23C 2255/12 . Depth stops

B23C 2260/00 **Details of constructional elements**
B23C 2260/04 . Adjustable elements
B23C 2260/08 . Bearings
B23C 2260/12 . Cams
B23C 2260/28 . Differential screw threads

B23C 2260/40 . Harmonic gearboxes, i.e. reduction gearing including a wave generator, a flex spline or a circular spline

B23C 2260/48 . Indication scales

B23C 2260/52 . Keys, e.g. spanners or Allen keys, especially for assembling or disassembling tooling

B23C 2260/56 . Lasers (improving machinability with laser whilst milling B23P 25/003)

B23C 2260/68 . Rings

B23C 2260/72 . Seals

B23C 2260/76 . Sensors

B23C 2260/80 . Serrations

B23C 2260/84 . Springs

B23C 2260/88 . Steadies

B23C 2265/00 Details of general geometric configurations

B23C 2265/08 . Conical

B23C 2265/12 . Eccentric

B23C 2265/16 . Elliptical

B23C 2265/32 . Polygonal

B23C 2265/36 . Spherical

B23C 2265/40 . Spiral

B23C 2270/00 Details of milling machines, milling processes or milling tools not otherwise provided for

B23C 2270/02 . Use of a particular power source

B23C 2270/022 . . Electricity

B23C 2270/025 . . Hydraulics

B23C 2270/027 . . Pneumatics

B23C 2270/04 . Use of centrifugal force (compensation of effect of centrifigal force B23C 2250/08)

B23C 2270/06 . Use of elastic or plastic deformation (B23C 2210/161 takes precedence)

B23C 2270/08 . Clamping mechanisms or provision for clamping (B23C 2210/16 takes precedence)

B23C 2270/10 . Use of ultrasound

B23C 2270/12 . Centering of two elements relative to one another

B23C 2270/14 . Constructions comprising exactly two similar components

B23C 2270/16 . Constructions comprising three or more similar components

B23C 2270/18 . Milling internal areas of components

B23C 2270/20 . Milling external areas of components