

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING (NOTES omitted)

### SHAPING

## B24 GRINDING; POLISHING (NOTE omitted)

## B24B MACHINES, DEVICES, OR PROCESSES FOR GRINDING OR POLISHING (grinding of gear teeth [B23F](#), of screw-threads [B23G 1/36](#); by electro-erosion [B23H](#); abrasive or related blasting [B24C](#); tools for grinding, buffing or sharpening [B24D](#); polishing compositions [C09G 1/00](#); abrasives [C09K 3/14](#); electrolytic etching or polishing [C25F 3/00](#); grinding arrangements for use on assembled railway tracks [E01B 31/17](#)); **DRESSING OR CONDITIONING OF ABRADING SURFACES; FEEDING OF GRINDING, POLISHING, OR LAPPING AGENTS**

### NOTES

1. In this subclass, the following term is used with the meaning indicated:  
"polishing" means the smoothing of a surface, i.e. a surface improvement but no improvement of the dimensional accuracy as would occur in a "grinding" operation.
2. Attention is drawn to Notes (1) and (2) following the title of subclass [B23F](#).
3. In groups [B24B 1/00](#) - [B24B 27/00](#), in connection with glass the terms "grinding" and "polishing" are treated as being equivalent.

### 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.

|             |  |       |  |
|-------------|--|-------|--|
| <b>1/00</b> | <b>Processes of grinding or polishing; Use of auxiliary equipment in connection with such processes</b>  | 3/022 | . . {relief grinding of milling cutters}                                 |
| 1/002       | . {using electric current ( <a href="#">B24B 37/046</a> and <a href="#">B23H 5/08</a> take precedence)}  | 3/024 | . . {Indexing equipment}   |
| 1/005       | . {using a magnetic polishing agent}   | 3/025 | . . {Tooth rests; Supporting means for milling-cutter grinding machines} |
| 1/007       | . {abrasive treatment to obtain an aged or worn-out appearance}  | 3/027 | . . {of milling cutters with embedded cutters}                           |
| 1/04        | . subjecting the grinding or polishing tools, the abrading or polishing medium or work to vibration, e.g. grinding with ultrasonic frequency (involving oscillating or vibrating containers <a href="#">B24B 31/06</a> ; superfinishing surfaces on work, e.g. by means of abrading blocks reciprocating with high frequency, <a href="#">B24B 35/00</a> ) | 3/028 | . . {of tapered milling cutters}   |
|             |  | 3/04  | . . of plain milling cutters   |
|             |  | 3/045 | . . . {of milling cutters with helical cutting edges}                    |
|             |  | 3/06  | . . of face or end milling cutters or cutter heads, e.g. of shank type   |
|             |  | 3/065 | . . . {end milling cutters with rounded ends}                            |
|             |  | 3/08  | . . of profile milling cutters, e.g. of disc type                        |
|             |  | 3/085 | . . . {using a template}   |
|             |  | 3/10  | . . of routers or engraving needles                                      |
|             |  | 3/12  | . . of hobs  |
|             |  | 3/14  | . . of mortise chain cutters   |
|             |  | 3/16  | . of broaches  |
|             |  | 3/18  | . of taps or reamers   |
|             |  | 3/20  | . . Tapering or chamfering taps or reamers                               |
|             |  | 3/22  | . . Relief cutting of taps or reamers                                    |
|             |  | 3/24  | . of drills (by fluting the shank <a href="#">B24B 19/04</a> )           |
|             |  | 3/242 | . . {of step drills}   |
|             |  | 3/245 | . . {for simultaneously sharpening several drills; Supports therefor}    |
| 3/003       | . {for skate blades}   | 3/247 | . . {Supports for drills ( <a href="#">B24B 3/245</a> takes precedence)} |
| 3/006       | . {for edges of skis, snowboards or the like}  | 3/26  | . . of the point of twist drills   |
| 3/02        | . of milling cutters   |       |  |
| 3/021       | . . {of milling cutters with helical cutting edges}  |       |  |

- 3/265 . . . {using devices specially adapted for domestic use}
- 3/28 . . . by swivelling the drill around an axis angularly to the drill axis
- 3/30 . . . . and rotating the drill about its own axis
- 3/32 . . . for thinning the point
- 3/33 . . of drills for stone
- 3/34 . of turning or planing tools or tool bits, e.g. gear cutters ([B24B 3/36 takes precedence](#))
- 3/343 . . {of throw-away cutting bits}
- 3/346 . . {of gear shaper cutter}
- 3/36 . of cutting blades ([B24B 3/58 takes precedence](#))
- 3/361 . . {of reciprocating blades}
- 3/363 . . {of blades mounted on a turning drum}
- 3/365 . . {of rotary mower blades}
- 3/366 . . {of meat mincing or meat grinding machines}
- 3/368 . . {installed as an accessory on another machine ([B26D 7/12 takes precedence](#))}
- 3/38 . . for planing wood, e.g. cutter blades
- 3/40 . . Processes or apparatus specially adapted for sharpening curved edges
- 3/42 . . helically bent, e.g. for lawn mowers
- 3/44 . . of scythes or sickles
- 3/46 . . of disc blades
- 3/463 . . . {of slicing machine disc blades}
- 3/466 . . . {of cultivator disc blades}
- 3/48 . . of razor blades or razors ([by an abrasive block without mechanisms B24D](#))
- 3/485 . . . {for travelling razor blades, in the form of a band or fitted on a transfer means}
- 3/50 . . . operated manually
- 3/52 . . of shear blades or scissors
- 3/54 . . of hand or table knives
- 3/543 . . . {using hand or foot driven tools}
- 3/546 . . . {the tool being driven in a non-rotary motion, e.g. oscillatory, gyratory}
- 3/55 . of knife bars for harvesting machines
- 3/56 . of slicing bands ([B24B 3/58 takes precedence](#))
- 3/58 . of tools having scalloped cutting edges
- 3/583 . . {of bands}
- 3/586 . . {of serrated edges, e.g. triangular shaped ([B24B 3/583 takes precedence](#))}
- 3/60 . of tools not covered by the preceding subgroups
- 3/602 . . {of thread cutting tools}
- 3/605 . . {of surgical or dental instruments}
- 3/607 . . {of files}
- 5/04 . . for grinding cylindrical surfaces externally ([grinding combined cylindrical and conical surfaces B24B 5/14](#))
- 5/042 . . . {for grinding several workpieces at once using one grinding wheel}
- 5/045 . . . {with the grinding wheel axis perpendicular to the workpiece axis}
- 5/047 . . . {of workpieces turning about a vertical axis}
- 5/06 . . for grinding cylindrical surfaces internally ([B24B 5/40 takes precedence](#))
- 5/065 . . . {for brake drums}
- 5/08 . . . involving a vertical tool spindle
- 5/10 . . . involving a horizontal tool spindle
- 5/12 . . for grinding cylindrical surfaces both externally and internally with several grinding wheels
- 5/14 . . for grinding conical surfaces, e.g. of centres
- 5/16 . . for grinding peculiarly surfaces, e.g. bulged
- 5/162 . . . {controlled by a template ([B24B 5/167 takes precedence](#))}
- 5/165 . . . {controlled by gearing ([B24B 5/167 takes precedence](#))}
- 5/167 . . . {for rolls with large curvature radius, e.g. mill rolls}
- 5/18 . involving centreless means for supporting, guiding, floating or rotating work ([centreless turning B23B 5/08; centreless grinding of threads B23G 1/42](#))
- 5/185 . . {for internal surfaces}
- 5/20 . . involving grooved abrading blocks
- 5/22 . . for grinding cylindrical surfaces, e.g. on bolts
- 5/225 . . . {for mass articles}
- 5/24 . . for grinding conical surfaces
- 5/245 . . . {for mass articles}
- 5/26 . . for grinding peculiarly profiled surfaces, e.g. bulged
- 5/28 . . for grinding outer surfaces concentrically to bores, involving additional centering means
- 5/30 . . Regulating-wheels; Equipment therefor
- 5/307 . . Means for supporting work
- 5/313 . involving work-supporting means carrying several workpieces to be operated on in succession
- 5/32 . . the work-supporting means being indexable
- 5/35 . Accessories
- 5/355 . . {Feeding means}
- 5/36 . Single-purpose machines or devices
- 5/363 . . {for grinding surfaces of revolution [in situ](#)}
- 5/366 . . {for grinding tyres}
- 5/37 . . for grinding rolls, e.g. barrel-shaped rolls
- 5/38 . . for externally grinding travelling elongated stock, e.g. wire
- 5/40 . . for grinding tubes internally
- 5/42 . . for grinding crankshafts or crankpins
- 5/421 . . . {Supports therefor}
- 5/423 . . . {having a grinding wheel turning around the workpiece}
- 5/425 . . . {in situ}
- 5/426 . . . {Portable devices therefor}
- 5/428 . . . {Balancing means}
- 5/44 . . for grinding rims of vehicle wheels, e.g. for bicycles
- 5/46 . . for grinding railway car wheels
- 5/48 . . for grinding walls of very fine holes, e.g. in drawing-dies

#### Grinding surfaces of particular forms

- 5/00 Machines or devices designed for grinding surfaces of revolution on work, including those which also grind adjacent plane surfaces; Accessories therefor ([B24B 11/00 - B24B 21/00 take precedence](#); honing machines or devices using abrading blocks performing axial and rotary movements superimposed on one another [B24B 33/00](#))**
- 5/01 . for combined grinding of surfaces of revolution and of adjacent plane surfaces on work
- 5/02 . involving centres or chucks for holding work
- 5/025 . . {involving indexable work supporting means carrying several work pieces to be operated on in succession}

- 5/485 . . . {using grinding wires or ropes}
- 5/50 . characterised by a special design with respect to properties of the material of non-metallic articles to be ground, e.g. strings (cutting profiles into the treads of tyres [B29D 30/68](#))
- 7/00 Machines or devices designed for grinding plane surfaces on work, including polishing plane glass surfaces; Accessories therefor ([B24B 21/00](#) takes precedence; honing of plane surfaces on work [B24B 33/055](#))**
  - 7/005 . {Portal grinding machines}
  - 7/02 . involving a reciprocatingly-moved work-table (involving a reciprocatingly-moved grinding wheel in combination with a stationary work-table [B24B 7/07](#))
  - 7/04 . involving a rotary work-table
  - 7/06 . involving conveyor belts, a sequence of travelling work-tables or the like
  - 7/07 . involving a stationary work-table
  - 7/075 . . {using a reciprocating grinding head mounted on a movable carriage}
  - 7/08 . . having an abrasive wheel built in
  - 7/10 . Single-purpose machines or devices (grinding tools or machines specially designed for use on assembled railway track [E01B 31/17](#))
  - 7/12 . . for grinding travelling elongated stock, e.g. strip-shaped work
  - 7/13 . . . grinding while stock moves from coil to coil
  - 7/14 . . for grinding slideways (portable grinding machines designed for fastening on workpieces [B24B 23/08](#))
  - 7/16 . . for grinding end-faces, e.g. of gauges, rollers, nuts, piston rings (for combined grinding of surfaces of revolution and adjacent plane surfaces on work [B24B 5/01](#); for grinding edges of bevels on work [B24B 9/00](#))
  - 7/162 . . . {for mass articles}
  - 7/165 . . . {end faces of piston rings}
  - 7/167 . . . {end faces coil springs}
  - 7/17 . . . for simultaneously grinding opposite and parallel end faces, e.g. double disc grinders
  - 7/18 . . for grinding floorings, walls, ceilings or the like (machines or devices for cleaning floorings [A47L 11/00](#), [A47L 13/00](#))
  - 7/182 . . . {for walls and ceilings}
  - 7/184 . . . . {pole sanders}
  - 7/186 . . . {with disc-type tools}
  - 7/188 . . . {with cylinder- or belt-type tools}
  - 7/19 . . for grinding plane decorative patterns
  - 7/20 . characterised by a special design with respect to properties of the material of non-metallic articles to be ground
  - 7/22 . . for grinding inorganic material, e.g. stone, ceramics, porcelain
  - 7/222 . . . {for grinding vertical surfaces ([B24B 7/265](#) takes precedence)}
  - 7/224 . . . {Portal grinding machines; Machines having a tool movable in a plane}
  - 7/226 . . . {in which the tool is supported by the workpiece}
  - 7/228 . . . {for grinding thin, brittle parts, e.g. semiconductors, wafers (grinding edges of thin, brittle parts [B24B 9/065](#))}
- 7/24 . . . for grinding or polishing glass
- 7/241 . . . . {Methods}
- 7/242 . . . . {for plate glass}
- 7/244 . . . . . {continuous}
- 7/245 . . . . . {discontinuous}
- 7/247 . . . . {using reciprocating grinding tools}
- 7/248 . . . . . {high-frequency reciprocating tools, e.g. magnetically driven}
- 7/26 . . . . for simultaneously grinding or polishing opposite faces of continuously travelling sheets or bands
- 7/265 . . . . . {of vertical surfaces}
- 7/28 . . for grinding wood
- 7/30 . . for grinding plastics
- 9/00 Machines or devices designed for grinding edges or bevels on work or for removing burrs; Accessories therefor ([B24B 21/00](#) takes precedence; for sharpening cutting edges on tools [B24B 3/00](#); removing burrs by loose abrasive material [B24B 31/00](#))**
  - 9/002 . . {for travelling workpieces}
  - 9/005 . . {for mass articles}
  - 9/007 . . {for end faces of tubes}
  - 9/02 . characterised by a special design with respect to properties of materials specific to articles to be ground
  - 9/04 . . of metal, e.g. skate blades ([B24B 3/003](#) takes precedence)}
  - 9/06 . . of non-metallic inorganic material, e.g. stone, ceramics, porcelain
  - 9/065 . . . {of thin, brittle parts, e.g. semiconductors, wafers}
  - 9/08 . . . of glass
  - 9/085 . . . . {for watch glasses}
  - 9/10 . . . . of plate glass
  - 9/102 . . . . . {for travelling sheets}
  - 9/105 . . . . . {using a template}
  - 9/107 . . . . . {for glass plates while they are turning}
  - 9/12 . . . . of hollow glassware, e.g. drinking glasses, preserve jars, television picture tube viewing panels
  - 9/14 . . . . of optical work, e.g. lenses, prisms {(control of the position of the tool for bevelling optical work [B24B 47/225](#))}
  - 9/142 . . . . . {for contact lenses}
  - 9/144 . . . . . {the spectacles being used as a template}
  - 9/146 . . . . . {Accessories, e.g. lens mounting devices}
  - 9/148 . . . . . {electrically, e.g. numerically, controlled}
  - 9/16 . . . of diamonds; of jewels or the like; Diamond grinders' dops; Dop holders or tongs (for grinding sharp pointed diamonds or sapphires [B24B 19/16](#))
  - 9/161 . . . . {Dops, dop holders}
  - 9/162 . . . . {by bruting, i.e. rubbing two precious stones against each other}
  - 9/163 . . . . {of gem stones or convex surfaces, cabochons}
  - 9/164 . . . . {of diamond tools}
  - 9/165 . . . . {for grinding cavities in gem stones}
  - 9/166 . . . . {using heat}
  - 9/167 . . . . {with means for turning and positioning the gem stones}

- 9/168 . . . . {grinding peripheral, e.g. conical or cylindrical, surfaces}
- 9/169 . . . . {using templates}
- 9/18 . . of wood
- 9/20 . . of plastics
- 11/00 Machines or devices designed for grinding spherical surfaces or parts of spherical surfaces on work; Accessories therefor (specially designed for optical surfaces [B24B 13/00](#), for seat surfaces [B24B 15/00](#))**
  - 11/02 . for grinding balls
  - 11/04 . . involving grinding wheels
  - 11/06 . . . acting by the front faces, e.g. of plane, grooved or bevelled shape
  - 11/08 . . . acting by the circumference
  - 11/10 . . . of cup type
- 13/00 Machines or devices designed for grinding or polishing optical surfaces on lenses or surfaces of similar shape on other work; Accessories therefor (edging optical work, e.g. lenses, prisms [B24B 9/14](#))**
  - 13/0006 . {for intraocular lenses}
  - 13/0012 . {for multifocal lenses}
  - 13/0018 . {for plane optical surfaces}
  - 13/0025 . {for contact lenses}
  - 13/0031 . {Machines having several working posts; Feeding and manipulating devices}
  - 13/0037 . . {the lenses being worked by different tools, e.g. for rough-grinding, fine-grinding, polishing}
  - 13/0043 . {the workpieces being deformed during the grinding operation}
  - 13/005 . Blocking means, chucks or the like; Alignment devices
  - 13/0052 . . {Lens block moulding devices}
  - 13/0055 . . {Positioning of lenses; Marking of lenses}
  - 13/0057 . . {Deblocking of lenses}
  - 13/01 . Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools
  - 13/012 . . {conformable in shape to the optical surface, e.g. by fluid pressure acting on an elastic membrane}
  - 13/015 . of television picture tube viewing panels, headlight reflectors or the like
  - 13/02 . by means of tools with abrading surfaces corresponding in shape with the lenses to be made
  - 13/023 . . {for grinding several lenses simultaneously}
  - 13/026 . . {the contact between tool and workpiece being a line}
  - 13/04 . grinding of lenses involving grinding wheels controlled by gearing ([B24B 13/06](#) takes precedence)
  - 13/043 . . {using cup-type grinding wheels}
  - 13/046 . . {using a pointed tool or scraper-like tool ([B24B 13/015](#) and [B24B 13/065](#) take precedence)}
  - 13/06 . grinding of lenses, the tool or work being controlled by information-carrying means, e.g. patterns, punched tapes, magnetic tapes
  - 13/065 . . {using a template}
- 15/00 Machines or devices designed for grinding seat surfaces; Accessories therefor (for spherical surfaces in general [B24B 11/00](#))**
  - 15/02 . in valve housings
  - 15/03 . . using portable or mobile machines
  - 15/04 . on valve members
  - 15/06 . on openings of bottles; on bottle stoppers or the like
  - 15/08 . for grinding co-operating seat surfaces by moving one over the other
- 17/00 Special adaptations of machines or devices for grinding controlled by patterns, drawings, magnetic tapes or the like (machines or devices so-controlled for grinding the edges of lenses [B24B 9/14](#); for grinding or polishing optical lens surfaces [B24B 13/06](#); for grinding non-circular cross-sections [B24B 19/08](#); for grinding trochoidal surfaces [B24B 19/09](#); for grinding cams [B24B 19/12](#); for grinding turbine blades or the like [B24B 19/14](#); such control means per se [B23Q 33/00](#), [B23Q 35/00](#), [G05](#)); Accessories therefor**
  - 17/02 . involving mechanical transmission means only
  - 17/021 . . {using a pantograph}
  - 17/023 . . {using two or more templates}
  - 17/025 . . {for grinding rotating workpieces (three dimensional)}
  - 17/026 . . . {for the periphery of plane workpieces, e.g. cams, lenses}
  - 17/028 . . {using an abrasive belt}
  - 17/04 . involving optical auxiliary means, e.g. optical projection form grinding machines
  - 17/06 . . combined with electrical transmission means, e.g. controlled by photoelectric cells
  - 17/08 . involving fluid transmission means only
  - 17/10 . involving electrical transmission means only, e.g. controlled by magnetic tape
- 19/00 Single-purpose machines or devices for particular grinding operations not covered by any other main group (tapering, chamfering, or relief cutting of taps or reamers [B24B 3/20](#), [B24B 3/22](#), grinding screw threads [B23G](#))**
  - 19/001 . {for table cutlery}
  - 19/002 . . {for knife blades (sharpening table knife blades [B24B 3/54](#))}
  - 19/003 . {for the underframes of locomotives}
  - 19/004 . {for grinding rails, T, I, H or other similar profiles}
  - 19/005 . {for grinding skins or similar sheets}
  - 19/006 . {for grinding hollow glassware, bottles}
  - 19/007 . {for grinding buttons, nail heads, screw heads, bottle capsules or the like}
  - 19/008 . {for grinding ceramics, pottery, table ware}
  - 19/009 . {for grinding profiled workpieces using a profiled grinding tool}
  - 19/02 . for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements
  - 19/022 . . {for helicoidal grooves ([B24B 19/04](#) takes precedence)}
  - 19/024 . . . {on electrical resistances}
  - 19/026 . . {for checks for pilger rolls}
  - 19/028 . . {for microgrooves or oil spots}
  - 19/03 . . for grinding grooves in glass workpieces, e.g. decorative grooves
  - 19/04 . . for fluting drill shanks
  - 19/06 . . for grinding races, e.g. roller races
  - 19/08 . for grinding non-circular cross-sections, e.g. shafts of elliptical or polygonal cross-section
  - 19/09 . . for grinding trochoidal surfaces, e.g. in rotor housings of Wankel engines



- 19/095 . . . {using templates}
- 19/10 . . for grinding pistons
- 19/11 . . for grinding the circumferential surface of rings, e.g. piston rings ([grinding end faces B24B 7/16, B24B 7/17](#))
- 19/12 . . for grinding cams or camshafts
- 19/125 . . . {electrically controlled, e.g. numerically controlled}
- 19/14 . . for grinding turbine blades, propeller blades or the like ([using grinding belts B24B 21/16](#))
- 19/16 . . for grinding sharp-pointed workpieces, e.g. needles, pens, fish hooks, tweezers or record player styli ([grinding bevels on diamonds or sapphires B24B 9/16; polishing of needles B24B 29/08](#))
- 19/165 . . {Phonograph needles and the like}
- 19/18 . . for grinding carding equipment, e.g. card-clothings ([devices for sharpening card-clothings built in or attachable to carding machines D01G](#))
- 19/20 . . for grinding dies ([for grinding walls of very fine holes B24B 5/48](#))
- 19/22 . . characterised by a special design with respect to properties of the material of non-metallic articles to be ground
- 19/223 . . {of paper or similar sheet material, e.g. perforating, cutting by means of a grinding wheel}
- 19/226 . . {of the ends of optical fibres}
- 19/24 . . of wood, e.g. furniture
- 19/26 . . for grinding workpieces with arcuate surfaces, e.g. parts of car bodies, bumpers or magnetic recording heads ([grinding of spherical surfaces in general B24B 11/00, of optical surfaces on lenses or surfaces of similar shape on other work B24B 13/00](#))
- 19/265 . . {for bumpers}
- 19/28 . . for grinding shoes or linings of drum brakes ([of brake drum hubs B24B 5/06, of brake discs B24B 7/17](#))
- 21/00 Machines or devices using grinding or polishing belts ([for sharpening cutting edges of tools B24B 3/00; portable belt-grinding machines B24B 23/06](#)); Accessories therefor**
- 21/002 . . {for grinding edges or bevels}
- 21/004 . . {using abrasive rolled strips}
- 21/006 . . {for special purposes, e.g. for television tubes, car bumpers}
- 21/008 . . {Machines comprising two or more tools or having several working posts ([B24B 21/006 takes precedence](#))}
- 21/02 . . for grinding rotationally symmetrical surfaces
- 21/025 . . {for travelling elongated stock, e.g. wire}
- 21/04 . . for grinding plane surfaces
- 21/06 . . involving members with limited contact area pressing the belt against the work, e.g. shoes sweeping across the whole area to be ground ([B24B 21/12 takes precedence](#))
- 21/08 . . . Pressure shoes; {Pressure members, e.g.} backing belts
- 21/10 . . involving a rigid member, e.g. pressure bar, table, pressing or supporting the belt over substantially its whole span
- 21/12 . . involving a contact wheel or roller pressing the belt against the work
- 21/14 . . . Contact wheels; Contact rollers; Belt supporting rolls
- 21/16 . . for grinding other surfaces of particular shape ([single purpose machines for grinding cams or camshafts B24B 19/12](#))
- 21/165 . . {for vanes or blades of turbines, propellers, impellers, compressors and the like}
- 21/18 . . Accessories
- 21/20 . . for controlling or adjusting the tracking or the tension of the grinding belt
- 21/22 . . for producing a reciprocation of the grinding belt normal to its direction of movement
- 23/00 Portable grinding machines, e.g. hand-guided; Accessories therefor ([B24B 7/18 takes precedence; for grinding seat surfaces B24B 15/00; having a flexible shaft B24B 27/027; grinders for cutting-off B24B 27/08; dust extraction equipment B24B 55/10; details or components, e.g. casings, bodies of portable power-driven tools not particularly related to the operation performed B25F 5/00](#))**
- 23/005 . . {Auxiliary devices used in connection with portable grinding machines, e.g. holders}
- 23/02 . . with rotating grinding tools; Accessories therefor
- 23/022 . . {Spindle-locking devices, e.g. for mounting or removing the tool}
- 23/024 . . {driven by hands or feet}
- 23/026 . . {Fluid driven}
- 23/028 . . {Angle tools}
- 23/03 . . the tool being driven in a combined movement
- 23/04 . . with oscillating grinding tools; Accessories therefor
- 23/043 . . {reciprocatingly driven by a pneumatic or hydraulic piston}
- 23/046 . . {Clamping or tensioning means for abrasive sheets}
- 23/06 . . with abrasive belts, e.g. with endless travelling belts; Accessories therefor
- 23/08 . . Portable grinding machines designed for fastening on workpieces or other parts of particular section, e.g. for grinding commutators
- 25/00 Grinding machines of universal type**
- 27/00 Other grinding machines or devices**
- 27/0007 . . {Movable machines}
- 27/0015 . . {Hanging grinding machines}
- 27/0023 . . {grinding machines with a plurality of working posts}
- 27/003 . . {using a tool turning around the work-piece}
- 27/0038 . . {with the grinding tool mounted at the end of a set of bars}
- 27/0046 . . {Column grinding machines}
- 27/0053 . . {Radial grinding machines}
- 27/0061 . . {having several tools on a revolving tools box}
- 27/0069 . . {with means for feeding the work-pieces to the grinding tool, e.g. turntables, transfer means ([see also B24B 27/0023, B24B 7/16](#))}
- 27/0076 . . {grinding machines comprising two or more grinding tools}
- 27/0084 . . {the grinding wheel support being angularly adjustable}
- 27/0092 . . {Grinding attachments for lathes or the like}
- 27/02 . . Bench grinders
- 27/027 . . having a flexible shaft

- 27/033 . . for grinding a surface for cleaning purposes, e.g. for descaling or for grinding off flaws in the surface
- 27/04 . . Grinding machines or devices in which the grinding tool is supported on a swinging arm
- 27/06 . Grinders for cutting-off
- 27/0608 . . {using a saw movable on slideways}
- 27/0616 . . {using a tool turning around the workpiece}
- 27/0625 . . {whereby the workpieces are radially fed by means of a turning drum}
- 27/0633 . . {using a cutting wire}
- 27/0641 . . {for grinding holes}
- 27/065 . . {the saw being mounted on a pivoting arm}
- 27/0658 . . {for cutting workpieces while they are turning about their longitudinal axis}
- 27/0666 . . {the saw blade being arranged underneath a work-table}
- 27/0675 . . {methods therefor}
- 27/0683 . . {Accessories therefor}
- 27/0691 . . . {for controlling the feeding or return movement of the saw}
- 27/08 . . being portable
- 27/085 . . . {Stands therefor}

**Polishing surfaces** (machines or devices for grinding or polishing glass [B24B 7/24](#), [B24B 9/00](#), [B24B 13/00](#); for grinding or polishing using belts [B24B 21/00](#)); **Finishing surfaces** ([B24B 3/00](#) takes precedence)

**29/00 Machines or devices for polishing surfaces on work by means of tools made of soft or flexible material with or without the application of solid or liquid polishing agents (polishing tools in general [B24D 13/00](#))**

- 29/005 . {using brushes}
- 29/02 . designed for particular workpieces
- 29/04 . . for rotationally symmetrical workpieces, e.g. ball-, cylinder- or cone-shaped workpieces
- 29/06 . . for elongated workpieces having uniform cross-section in one main direction
- 29/08 . . . the cross-section being circular, e.g. tubes, wires, needles
- 29/10 . . for table cutlery

**31/00 Machines or devices designed for polishing or abrading surfaces on work by means of tumbling apparatus or other apparatus in which the work and/or the abrasive material is loose; Accessories therefor (abrasive blasting machines [B24C 3/26](#))**

- 31/003 . {whereby the workpieces are mounted on a holder and are immersed in the abrasive material}
- 31/006 . {for grinding the interior surfaces of hollow workpieces}
- 31/02 . involving rotary barrels
- 31/0206 . . {for descaling wires travelling through the rotating drum}
- 31/0212 . . {the barrels being submitted to a composite rotary movement}
- 31/0218 . . . {the barrels are moving around two parallel axes, e.g. gyratory, planetary movement ([B24B 31/033](#) takes precedence)}
- 31/0224 . . {the workpieces being fitted on a support}
- 31/023 . . with tiltable axis
- 31/027 . . with additional oscillating movement
- 31/03 . . the workpieces being continuously-travelling

- 31/033 . . having several rotating or tumbling drums with parallel axes
- 31/037 . . having several rotating or tumbling drums with non-parallel axes ([B24B 31/0212](#), [B24B 31/0218](#) take precedence)}
- 31/05 . involving a container formed as a conveyor belt
- 31/06 . involving oscillating or vibrating containers
- 31/062 . . {the workpieces travelling through the containers ([B24B 31/067](#), [B24B 31/073](#) take precedence)}
- 31/064 . . {the workpieces being fitted on a support}
- 31/067 . . involving a bowl formed as a straight through
- 31/073 . . involving a bowl being ring- or spiral-shaped
- 31/10 . involving other means for tumbling of work
- 31/102 . . {using an alternating magnetic field}
- 31/104 . . involving a rotating bowl, in which a ring zone of abrasive powder is formed by centrifugal force
- 31/108 . . involving a sectioned bowl, one part of which, e.g. its wall, is stationary and the other part of which is moved, e.g. rotated
- 31/112 . . using magnetically consolidated grinding powder, moved relatively to the workpiece under the influence of pressure
- 31/116 . . using plastically deformable grinding compound, moved relatively to the workpiece under the influence of pressure
- 31/12 . Accessories; Protective equipment or safety devices; Installations for exhaustion of dust or for sound absorption specially adapted for machines covered by group [B24B 31/00](#) {(in general [B24B 55/00](#))}
- 31/14 . . Abrading-bodies specially designed for tumbling apparatus, e.g. abrading-balls
- 31/16 . . Means for separating the workpiece from the abrasive medium at the end of operation

**33/00 Honing machines or devices; Accessories therefor**

- 33/02 . designed for working internal surfaces of revolution, e.g. of cylindrical or conical shapes
- 33/022 . . {Horizontal honing machines}
- 33/025 . . {Internal surface of conical shape}
- 33/027 . . {using an unexpandable tool}
- 33/04 . designed for working external surfaces of revolution
- 33/05 . designed for working grooves, e.g. in gun barrels
- 33/055 . designed for working plane surfaces
- 33/06 . with controlling or gauging equipment (gauging in general [G01B](#); controlling in general [G05](#))
- 33/08 . Honing tools {(for manufacturing gear teeth [B23F 21/03](#))}
- 33/081 . . {for external surfaces}
- 33/082 . . {having only one honing stone}
- 33/083 . . {with different sets of honing stones}
- 33/084 . . {having honing stones at the end of bars}
- 33/085 . . {in which the honing element consists of a deformable body}
- 33/086 . . {Abrading blocks for honing tools}
- 33/087 . . {provided with measuring equipment}
- 33/088 . . {for holes having a shape other than cylindrical}
- 33/089 . . {with a rack-and-pinion mechanism for expanding the honing segments}
- 33/10 . Accessories
- 33/105 . . {Honing spindles; Devices for expanding the honing elements ([B24B 33/04](#) takes precedence)}

- 35/00 Machines or devices designed for superfinishing surfaces on work, i.e. by means of abrading blocks reciprocating with high frequency**
- 35/005 . {for making three-dimensional objects (by electroerosion [B23H 5/04](#))}
- 37/00 Lapping machines or devices; Accessories**  
([B24B 3/00](#) takes precedence)
- 37/005 . Control means for lapping machines or devices
- 37/0053 . . {detecting loss or breakage of a workpiece during lapping}
- 37/0056 . . {taking regard of the pH-value of lapping agents}
- 37/013 . . Devices or means for detecting lapping completion
- 37/015 . . Temperature control
- 37/02 . designed for working surfaces of revolution
- 37/022 . . {characterised by the movement of the work between two lapping plates}
- 37/025 . . designed for working spherical surfaces
- 37/04 . designed for working plane surfaces
- 37/042 . . {operating processes therefor}
- 37/044 . . . {characterised by the composition of the lapping agent}
- 37/046 . . {using electric current}
- 37/048 . . {of sliders and magnetic heads of hard disc drives or the like}
- 37/07 . . characterised by the movement of the work or lapping tool
- 37/08 . . . for double side lapping
- 37/10 . . . for single side lapping
- 37/102 . . . . {the workpieces or work carriers being able to rotate freely due to a frictional contact with the lapping tool}
- 37/105 . . . . {the workpieces or work carriers being actively moved by a drive, e.g. in a combined rotary and translatory movement}
- 37/107 . . . . . {in a rotary movement only, about an axis being stationary during lapping}
- 37/11 . Lapping tools
- 37/12 . . Lapping plates for working plane surfaces
- 37/14 . . . characterised by the composition or properties of the plate materials
- 37/16 . . . characterised by the shape of the lapping plate surface, e.g. grooved
- 37/20 . . Lapping pads for working plane surfaces
- 37/205 . . . {provided with a window for inspecting the surface of the work being lapped}
- 37/22 . . . characterised by a multi-layered structure
- 37/24 . . . characterised by the composition or properties of the pad materials
- 37/245 . . . . {Pads with fixed abrasives}
- 37/26 . . . characterised by the shape of the lapping pad surface, e.g. grooved
- 37/27 . Work carriers
- 37/28 . . for double side lapping of plane surfaces
- 37/30 . . for single side lapping of plane surfaces
- 37/32 . . . Retaining rings
- 37/34 . Accessories
- 37/345 . . {Feeding, loading or unloading work specially adapted to lapping}

- 39/00 Burnishing machines or devices, i.e. requiring pressure members for compacting the surface zone (modifying the physical properties or structure of metal by burnishing [C21D 7/08](#), [C22F 1/00](#)); Accessories therefor**
- 39/003 . {the working tool being composed of a plurality of working rolls or balls}
- 39/006 . {Peening and tools therefor}
- 39/02 . designed for working internal surfaces of revolution
- 39/023 . . {the working tool being composed of a plurality of working rolls or balls}
- 39/026 . . {Impact burnishing}
- 39/04 . designed for working external surfaces of revolution
- 39/045 . . {the working tool being composed of a plurality of working rolls or balls}
- 39/06 . designed for working plane surfaces
- 39/065 . . {Graining of metal plates, e.g. printing or lithographic plates}

**Component parts of grinding machines or devices so far as specially adapted to grinding (if applicable to other machine tools, [B23Q](#) takes precedence; if peculiar to a particular type of machine or device, see the relevant group therefor)**

- 41/00 Component parts such as frames, beds, carriages, headstocks**
- 41/002 . {Grinding heads}
- 41/005 . {Feeding or manipulating devices specially adapted to grinding machines (feeding, loading or unloading work specially adapted to lapping machines [B24B 37/345](#))}
- 41/007 . {Weight compensation; Temperature compensation; Vibration damping}
- 41/02 . Frames; Beds; Carriages
- 41/04 . Headstocks; Working-spindles; Features relating thereto
- 41/042 . . {Balancing mechanisms}
- 41/044 . . {Grinding spindles with magnetic or electromagnetic bearings; Features related thereto (electric motors with magnetic bearings [H02K 7/09](#))}
- 41/047 . . Grinding heads for working on plane surfaces
- 41/0475 . . . {equipped with oscillating abrasive blocks, e.g. mounted on a rotating head}
- 41/053 . . . for grinding or polishing glass {([B24B 41/0475](#) takes precedence)}
- 41/06 . Work supports, e.g. adjustable steadies ([B24B 37/27](#) takes precedence)
- 41/061 . . {axially supporting turning workpieces, e.g. magnetically, pneumatically}
- 41/062 . . . {between centres; Dogs}
- 41/063 . . . . {Lubrication of centres}
- 41/065 . . {Steady rests}
- 41/066 . . {adapted for supporting work in the form of tools, e.g. drills}
- 41/067 . . {radially supporting workpieces}
- 41/068 . . {Table-like supports for panels, sheets or the like}
- 45/00 Means for securing grinding wheels on rotary arbors (suppression of vibrations in systems [F16F 15/00](#); testing static or dynamic balancing of machines [G01M 1/00](#))**
- 45/003 . {Accessories therefor}

- 45/006 . {Quick mount and release means for disc-like wheels, e.g. on power tools}
- 47/00 Drives or gearings; Equipment therefor**
- 47/02 . for performing a reciprocating movement of carriages or work- tables
- 47/04 . . by mechanical gearing only
- 47/06 . . by liquid or gas pressure only
- 47/08 . . by mechanical gearing combined with fluid systems
- 47/10 . for rotating or reciprocating working-spindles carrying grinding wheels or workpieces
- 47/12 . . by mechanical gearing or electric power ([B24B 47/16](#) takes precedence)
- 47/14 . . by liquid or gas pressure ([B24B 47/16](#) takes precedence)
- 47/16 . . performing a reciprocating movement, e.g. during which the sense of rotation of the working-spindle is reversed
- 47/18 . . for rotating the spindle at a speed adaptable to wear of the grinding wheel
- 47/20 . relating to feed movement
- 47/203 . . {driven by hand}
- 47/206 . . {for centreless grinding machines; for machines comprising work supports, e.g. steady rests}
- 47/22 . Equipment for exact control of the position of the grinding tool or work at the start of the grinding operation
- 47/225 . . {for bevelling optical work, e.g. lenses}
- 47/25 . for compensating grinding wheel abrasion resulting from dressing
- 47/26 . Accessories, e.g. stops
- 47/28 . Equipment for preventing backlash

**Measuring; Indicating; Controlling**

- 49/00 Measuring or gauging equipment for controlling the feed movement of the grinding tool or work; Arrangements of indicating or measuring equipment, e.g. for indicating the start of the grinding operation ([B24B 33/06](#), [B24B 37/005](#) take precedence; if applicable to other machine tools, [B23Q 15/00](#) - [B23Q 17/00](#) take precedence)**
- 49/003 . {involving acoustic means}
- 49/006 . {taking regard of the speed}
- 49/02 . according to the instantaneous size and required size of the workpiece acted upon, the measuring or gauging being continuous or intermittent ([B24B 49/12](#) takes precedence)
- 49/03 . . according to the final size of the previously ground workpiece
- 49/04 . . involving measurement of the workpiece at the place of grinding during grinding operation
- 49/045 . . . {Specially adapted gauging instruments}
- 49/05 . . . including the measurement of a first workpiece already machined and of another workpiece being machined and to be matched with the first one
- 49/06 . . requiring comparison of the workpiece with standard gauging plugs, rings or the like
- 49/08 . involving liquid or pneumatic means
- 49/10 . involving electrical means ([B24B 49/02](#), [B24B 49/08](#) take precedence)
- 49/105 . . {using eddy currents}
- 49/12 . involving optical means

- 49/14 . taking regard of the temperature during grinding
- 49/16 . taking regard of the load
- 49/165 . . {for grinding tyres}
- 49/18 . taking regard of the presence of dressing tools
- 49/183 . . {Wear compensation without the presence of dressing tools}
- 49/186 . . {taking regard of the wear of the dressing tools}
- 51/00 Arrangements for automatic control of a series of individual steps in grinding a workpiece (if applicable to other machine tools, [G05B](#) takes precedence)**
- 53/00 Devices or means for dressing or conditioning abrasive surfaces (compensation for grinding wheel abrasion resulting from dressing [B24B 47/25](#))**
- 53/001 . {involving the use of electric current}
- 53/003 . {using at least two conditioning tools}
- 53/005 . {Positioning devices for conditioning tools}
- 53/007 . Cleaning of grinding wheels
- 53/013 . Application of loose grinding agent as auxiliary tool during truing operation
- 53/017 . Devices or means for dressing, cleaning or otherwise conditioning lapping tools
- 53/02 . of plane surfaces on abrasive tools ([B24B 53/017](#) takes precedence)
- 53/04 . of cylindrical or conical surfaces on abrasive tools or wheels ([B24B 53/017](#) takes precedence)
- 53/047 . . equipped with one or more diamonds
- 53/053 . . using a rotary dressing tool
- 53/06 . of profiled abrasive wheels
- 53/062 . . {using rotary dressing tools ([B24B 53/07](#) takes precedence)}
- 53/065 . . having other than straight profiles, e.g. crowned ([B24B 53/07](#) takes precedence)
- 53/07 . . by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls
- 53/075 . . for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms ([B24B 53/07](#) takes precedence)
- 53/08 . . controlled by information means, e.g. patterns, templets, punched tapes or the like
- 53/081 . . . {by means of a template}
- 53/082 . . . . {for tools having a screw-thread profile}
- 53/083 . . . {for tools having a screw-thread profile ([B24B 53/081](#) takes precedence)}
- 53/085 . . . for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms {([B24B 53/082](#), [B24B 53/083](#), [B24B 53/09](#) take precedence)}
- 53/09 . . . having transfer elements formed as pantograph mechanism
- 53/095 . Cooling or lubricating during dressing operation ([cooling the grinding surfaces \[B24B 55/02\]\(#\)](#))
- 53/10 . of travelling flexible backings coated with abrasives; Cleaning of abrasive belts
- 53/12 . Dressing tools; Holders therefor
- 53/14 . . Dressing tools equipped with rotary rollers or cutters; Holders therefor



- 55/00 Safety devices for grinding or polishing machines; Accessories fitted to grinding or polishing machines for keeping tools or parts of the machine in good working condition (of general applicability for machine tools [B23Q 11/00](#); in general [F16P](#))**
- 55/02 . Equipment for cooling the grinding surfaces, e.g. devices for feeding coolant ([cooling or lubricating during dressing operation \[B24B 53/095\]\(#\); incorporated in grinding wheels \[B24D\]\(#\)](#))
- 55/03 . . designed as a complete equipment for feeding or clarifying coolant
- 55/04 . Protective covers for the grinding wheel
- 55/045 . . {with cooling means incorporated}
- 55/05 . . specially designed for portable grinding machines
- 55/052 . . . {with rotating tools}
- 55/055 . . . {with oscillating tools}
- 55/057 . . . {with belt-like tools}
- 55/06 . Dust extraction equipment on grinding or polishing machines ([B24B 31/12](#) takes precedence)
- 55/08 . . specially designed for belt grinding machines
- 55/10 . . specially designed for portable grinding machines, e.g. hand-guided
- 55/102 . . . {with rotating tools}
- 55/105 . . . {with oscillating tools}
- 55/107 . . . {with belt-like tools}
- 55/12 . Devices for exhausting mist of oil or coolant; Devices for collecting or recovering materials resulting from grinding or polishing, e.g. of precious metals, precious stones, diamonds or the like
- 57/00 Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents (for abrasive blasting [B24C 1/00](#), [B24C 7/00](#))**
- 57/02 . for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents
- 57/04 . for feeding of solid grinding, polishing or lapping agents