

SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B24 GRINDING; POLISHING

Note(s)

In this class, the following term is used with the meaning indicated:

- "grinding" is used in its most general sense to mean machining and covers, in particular, "corrective" operations.

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** [2]

Note(s)

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.

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GRINDING OR POLISHING PROCESSES NOT PARTICULAR TO SPECIFIC MACHINES, DEVICES OR WORK.....	1/00
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Note(s)

In groups B24B 1/00-B24B 27/00, in connection with glass the terms "grinding" and "polishing" are treated as being equivalent.

1/00 Processes of grinding or polishing; Use of auxiliary equipment in connection with such processes

(processes characterised by the use of special machines or devices, *see* the relevant places for those machines or devices) [4]

- 1/04 • subjecting the grinding or polishing tools, the abrading or polishing medium or work to vibration, e.g. grinding with ultrasonic frequency (polishing or abrading surfaces on work by means of tumbling apparatus B24B 31/00, involving oscillating or vibrating containers B24B 31/06; superfinishing surfaces on work, e.g. by means of abrading blocks reciprocating with high frequency, B24B 35/00) [4]

3/00 Sharpening cutting edges, e.g. of tools; Accessories therefor, e.g. for holding the tools (non-abrasive sharpening devices for scythes, sickles, or the like A01D 3/00; sharpening devices designed as components of machines with cutters, *see* the relevant places for the machines, e.g. A01D 75/08, B26D 7/12; sharpening of saw teeth B23D 63/12; sharpening of files or rasps B23D 73/00; grinding of die-stocks or chasers B23G 1/36)

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|------|--|
| 3/02 | • of milling cutters |
| 3/04 | • • of plain milling cutters |
| 3/06 | • • of face or end milling cutters or cutter heads, e.g. of shank type |
| 3/08 | • • of profile milling cutters, e.g. of disc type |
| 3/10 | • • of routers or engraving needles |
| 3/12 | • • of hobs |
| 3/14 | • • of mortise chain cutters |
| 3/16 | • of broaches |

B24B

- 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 B24B 19/04)
- 3/26 • • of the point of twist drills
- 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)
- 3/36 • of cutting blades (B24B 3/58 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 [2]
- 3/46 • • of disc blades
- 3/48 • • of razor blades or razors (by an abrasive block without mechanisms B24D)
- 3/50 • • • operated manually
- 3/52 • • of shear blades or scissors
- 3/54 • • of hand or table knives
- 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
- 3/60 • of tools not covered by the preceding subgroups

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) [2]

- 5/01 • for combined grinding of surfaces of revolution and of adjacent plane surfaces on work [4]
- 5/02 • involving centres or chucks for holding work
- 5/04 • • for grinding cylindrical surfaces externally (grinding combined cylindrical and conical surfaces B24B 5/14)
- 5/06 • • for grinding cylindrical surfaces internally (B24B 5/40 takes precedence)
- 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 profiled surfaces, e.g. bulged
- 5/18 • involving centreless means for supporting, guiding, floating or rotating work (centreless turning B23B 5/08; centreless grinding of threads B23G 1/42) [2]
- 5/20 • • involving grooved abrading blocks
- 5/22 • • for grinding cylindrical surfaces, e.g. on bolts
- 5/24 • • for grinding conical surfaces
- 5/26 • • for grinding peculiarly profiled surfaces, e.g. bulged
- 5/28 • • for grinding outer surfaces concentrically to bores, involving additional centring means
- 5/30 • • Regulating-wheels; Equipment therefor

- 5/307 • • Means for supporting work [3]
- 5/313 • involving work-supporting means carrying several workpieces to be operated on in succession [3]
- 5/32 • • the work-supporting means being indexable [3]
- 5/35 • Accessories [3]
- 5/36 • Single-purpose machines or devices
- 5/37 • • for grinding rolls, e.g. barrel-shaped rolls [4]
- 5/38 • • for externally grinding travelling elongated stock, e.g. wire
- 5/40 • • for grinding tubes internally
- 5/42 • • for grinding crankshafts or crankpins
- 5/44 • • 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
- 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) [4]

- 7/02 • involving a reciprocatingly-moved work-table (involving a reciprocatingly-moved grinding wheel in combination with a stationary work-table B24B 7/07) [4]
- 7/04 • involving a rotary work-table
- 7/06 • involving conveyer belts, a sequence of travelling work-tables or the like
- 7/07 • involving a stationary work-table [4]
- 7/08 • • having an abrasive wheel built in
- 7/10 • Single-purpose machines or devices (grinding tools or machines specially adapted for use on assembled railway track E01B 31/17)
- 7/12 • • for grinding travelling elongated stock, e.g. strip-shaped work [4]
- 7/13 • • • grinding while stock moves from coil to coil [4]
- 7/14 • • for grinding slideways (portable grinding machines designed for fastening on workpieces B24B 23/08) [4]
- 7/16 • • for grinding end faces, e.g. of gauges, rollers, nuts, piston rings (for combined grinding of surfaces of revolution and of adjacent plane surfaces on work B24B 5/01; for grinding edges or bevels on work B24B 9/00) [4]
- 7/17 • • • for simultaneously grinding opposite and parallel end faces, e.g. double disc grinders [4]
- 7/18 • • for grinding floorings, walls, ceilings or the like (machines or devices for cleaning floorings A47L 11/00, A47L 13/00)
- 7/19 • • for grinding plane decorative patterns [4]
- 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
- 7/24 • • • for grinding or polishing glass
- 7/26 • • • • for simultaneously grinding or polishing opposite faces of continuously travelling sheets or bands of glass
- 7/28 • • for grinding wood
- 7/30 • • for grinding plastics [4]

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)	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 <u>per se</u> B23Q 33/00, B23Q 35/00, G05); Accessories therefor [4]
9/02	• characterised by a special design with respect to properties of materials specific to articles to be ground	17/02	• involving mechanical transmission means only
9/04	• • of metal, e.g. skate blades	17/04	• involving optical auxiliary means, e.g. optical projection form grinding machines
9/06	• • of non-metallic inorganic material, e.g. stone, ceramics, porcelain	17/06	• • combined with electrical transmission means, e.g. controlled by photoelectric cells
9/08	• • • of glass	17/08	• involving fluid transmission means only
9/10	• • • • of plate glass	17/10	• involving electrical transmission means only, e.g. controlled by magnetic tape
9/12	• • • • of hollow glassware, e.g. drinking glasses, preserve jars, television picture tube viewing panels	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 1/36)
9/14	• • • • of optical work, e.g. lenses, prisms	19/02	• for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements [4]
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) [4]	19/03	• • for grinding grooves in glass workpieces, e.g. decorative grooves [4]
9/18	• • of wood	19/04	• • for fluting drill shanks
9/20	• • of plastics [4]	19/06	• • for grinding races, e.g. roller races
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)	19/08	• for grinding non-circular cross-sections, e.g. shafts of elliptical or polygonal cross-section
11/02	• for grinding balls	19/09	• • for grinding trochoidal surfaces, e.g. in rotor housings of Wankel engines [4]
11/04	• • involving grinding wheels	19/10	• • for grinding pistons
11/06	• • • acting by the front faces, e.g. of plane, grooved, or bevelled shape	19/11	• • for grinding the circumferential surface of rings, e.g. piston rings (grinding end faces B24B 7/16, B24B 7/17) [4]
11/08	• • • acting by the circumference	19/12	• • for grinding cams or camshafts
11/10	• • • of cup type	19/14	• for grinding turbine blades, propeller blades or the like (using grinding belts B24B 21/16) [4]
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) [2]	19/16	• for grinding sharp-pointed workpieces, e.g. needles, pens, fish hooks, tweezers, record player styli (grinding bevels on diamonds or sapphires B24B 9/16; polishing of needles B24B 29/08) [4]
13/005	• Blocking means, chucks or the like; Alignment devices [4]	19/18	• • for grinding carding equipment, e.g. card-clothings (devices for sharpening card-clothings built in, or attachable to, carding machines D01G)
13/01	• Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools [4]	19/20	• for grinding dies (for grinding walls of very fine holes B24B 5/48)
13/015	• of television picture tube viewing panels, headlight reflectors or the like [4]	19/22	• characterised by a special design with respect to properties of the material of non-metallic articles to be ground
13/02	• by means of tools with abrading surfaces corresponding in shape with the lenses to be made	19/24	• • of wood, e.g. furniture
13/04	• grinding of lenses involving grinding wheels controlled by gearing (B24B 13/06 takes precedence) [4]	19/26	• for grinding workpieces with arcuate surfaces, e.g. parts of car bodies, bumpers, 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) [4]
13/06	• grinding of lenses, the tool or work being controlled by information carrying means, e.g. patterns, punched tapes, magnetic tapes [4]	19/28	• • for grinding shoes or linings of drum brakes (of brake drum hubs B24B 5/06; of brake discs B24B 7/17) [4]
15/00	Machines or devices designed for grinding seat surfaces; Accessories therefor (for spherical surfaces in general B24B 11/00)	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 [4]
15/02	• in valve housings	21/02	• for grinding rotationally symmetrical surfaces
15/03	• • using portable or mobile machines [4]		
15/04	• on valve members		
15/06	• on openings of bottles; on bottle stoppers or the like [4]		
15/08	• for grinding co-operating seat surfaces by moving one over the other		

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- 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; 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 [4]
- 21/16 • for grinding other surfaces of particular shape (single purpose machines for grinding cams or camshafts B24B 19/12) [4]
- 21/18 • Accessories
- 21/20 • • for controlling or adjusting the tracking or the tension of the grinding belt [4]
- 21/22 • • for producing a reciprocation of the grinding belt normal to its direction of movement [4]
- 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) [4]
- 23/02 • with rotating grinding tools; Accessories therefor
- 23/03 • • the tool being driven in a combined movement [4]
- 23/04 • with oscillating grinding tools; Accessories therefor [4]
- 23/06 • with abrasive belts, e.g. with endless travelling belts; Accessories therefor [4]
- 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**
- 27/02 • Bench grinders [4]
- 27/027 • having a flexible shaft [4]
- 27/033 • for grinding a surface for cleaning purposes, e.g. for descaling or for grinding off flaws in the surface [4]
- 27/04 • • Grinding machines or devices in which the grinding tool is supported on a swinging arm
- 27/06 • Grinders for cutting-off
- 27/08 • • being portable [4]
- Polishing surfaces; Finishing surfaces**
- 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** (machines or devices for grinding or polishing glass B24B 7/24, B24B 9/08, B24B 13/00; for grinding or polishing using belts B24B 21/00; polishing tools in general B24D 13/00) [4]
- 29/02 • designed for particular workpieces [4]
- 29/04 • • for rotationally symmetrical workpieces, e.g. ball-, cylinder- or cone-shaped workpieces [4]
- 29/06 • • for elongated workpieces having uniform cross-section in one main direction [4]
- 29/08 • • • the cross-section being circular, e.g. tubes, wires, needles [4]
- 29/10 • • for table cutlery [4]
- 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 or the abrasive material is loose; Accessories therefor** (machines or devices for grinding or polishing glass B24B 7/24, B24B 9/08, B24B 13/00; abrasive blasting machines B24C 3/26)
- 31/02 • involving rotary barrels
- 31/023 • • with tiltable axis [4]
- 31/027 • • with additional oscillating movement [4]
- 31/03 • • the workpieces being continuously-travelling [4]
- 31/033 • • having several rotating or tumbling drums with parallel axes [4]
- 31/037 • • having several rotating or tumbling drums with non-parallel axes [4]
- 31/05 • involving a container formed as a conveyer belt [4]
- 31/06 • involving oscillating or vibrating containers
- 31/067 • • involving a bowl formed as a straight trough [4]
- 31/073 • • involving a bowl being ring- or spiral-shaped [4]
- 31/10 • involving other means for tumbling of work [4]
- 31/104 • • involving a rotating bowl, in which a ring zone of abrasive powder is formed by centrifugal force [4]
- 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 [4]
- 31/112 • • using magnetically consolidated grinding powder, moved relatively to the workpiece under the influence of pressure [4]
- 31/116 • • using plastically deformable grinding compound, moved relatively to the workpiece under the influence of pressure [4]
- 31/12 • Accessories; Protective equipment or safety devices; Installations for exhaustion of dust or for sound absorption specially designed for machines covered by group B24B 31/00 (in general B24B 55/00) [4]
- 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 [4]
- 33/00 Honing machines or devices; Accessories therefor**
- 33/02 • designed for working internal surfaces of revolution, e.g. of cylindrical or conical shapes
- 33/04 • 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 [4]
- 33/06 • with controlling or gauging equipment (gauging in general G01B; controlling in general G05)
- 33/08 • Honing tools
- 33/10 • Accessories
- 35/00 Machines or devices designed for superfinishing surfaces on work, i.e. by means of abrading blocks reciprocating with high frequency** (B24B 3/00 takes precedence)
- 37/00 Lapping machines or devices, i.e. requiring pulverulent abrading substances inserted between a lap of relatively soft but rigid material and the surface to be lapped; Accessories therefor** (B24B 3/00 takes precedence)
- 37/02 • designed for working surfaces of revolution
- 37/04 • designed for working plane surfaces

- 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** (B24B 3/00 takes precedence)
- 39/02 • designed for working internal surfaces of revolution
- 39/04 • designed for working external surfaces of revolution
- 39/06 • designed for working plane surfaces [4]

Component parts of general applicability for grinding machines or devices

- 41/00 Component parts of grinding machines or devices, such as frames, beds, carriages or headstocks**
- 41/02 • Frames; Beds; Carriages
- 41/04 • Headstocks; Working-spindles; Features relating thereto
- 41/047 • • Grinding heads for working on plane surfaces [4]
- 41/053 • • • for grinding or polishing glass [4]
- 41/06 • Work supports, e.g. adjustable steadies
- 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)

- 47/00 Drives or gearings for grinding machines or devices; 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
- 47/22 • Equipment for exact control of the position of the grinding tool or work at the start of the grinding operation
- 47/25 • for compensating grinding wheel abrasion resulting from dressing [4]
- 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 takes precedence; if applicable to other machine tools, B23Q 15/00-B23Q 17/00 take precedence; gauging instruments in general G01B)

- 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) [4]
- 49/03 • • according to the final size of the previously ground workpiece [4]
- 49/04 • • involving measurement of the workpiece at the place of grinding during grinding operation [4]
- 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 [4]
- 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)
- 49/12 • involving optical means
- 49/14 • taking regard of the temperature during grinding
- 49/16 • taking regard of the load
- 49/18 • taking regard of the presence of dressing tools

51/00 Arrangements for automatic control of a series of individual steps in grinding a workpiece

- 53/00 Devices or means for dressing or conditioning abrasive surfaces** (compensation for grinding wheel abrasion resulting from dressing B24B 47/25) [4]
- 53/007 • Cleaning of grinding wheels [4]
- 53/013 • Application of loose grinding agent as auxiliary tool during truing operation [4]
- 53/02 • of plane surfaces on abrasive tools
- 53/04 • of cylindrical or conical surfaces on abrasive tools or wheels [4]
- 53/047 • • equipped with one or more diamonds [4]
- 53/053 • • using a rotary dressing tool [4]
- 53/06 • of profiled abrasive wheels
- 53/065 • • having other than straight profiles, e.g. crowned (B24B 53/07 takes precedence) [4]
- 53/07 • • by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls [4]
- 53/075 • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/07 takes precedence) [4]
- 53/08 • • controlled by information means, e.g. patterns, templets, punched tapes or the like
- 53/085 • • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/09 takes precedence) [4]
- 53/09 • • • having transfer elements formed as pantograph mechanism [4]
- 53/095 • Cooling or lubricating during dressing operation (cooling the grinding surfaces B24B 55/02) [4]
- 53/10 • of travelling flexible backings coated with abrasives; Cleaning of abrasive belts [4]
- 53/12 • Dressing tools; Holders therefor [4]
- 53/14 • • Dressing tools equipped with rotary rollers or cutters; Holders therefor [4]
- 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)

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| 55/02 | • Equipment for cooling the grinding surfaces, including devices for feeding coolant (cooling or lubricating during dressing operation B24B 53/095; incorporated in grinding wheels B24D) [4] | 55/10 | • • specially designed for portable grinding machines, e.g. hand-guided [4] |
| 55/03 | • • designed as a complete equipment for feeding or clarifying coolant [4] | 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 [4] |
| 55/04 | • Protective covers for the grinding wheel | 57/00 | Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents (for abrasive blasting B24C 1/00, B24C 7/00) [4] |
| 55/05 | • • specially designed for portable grinding machines [4] | 57/02 | • for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents [4] |
| 55/06 | • Dust extraction equipment on grinding or polishing machines (B24B 31/12 takes precedence) | 57/04 | • for feeding of solid grinding, polishing or lapping agents [4] |
| 55/08 | • • specially designed for belt grinding machines [4] | | |

B24C ABRASIVE OR RELATED BLASTING WITH PARTICULATE MATERIAL

Note(s)

1. This subclass covers:
 - the use of a blast of any particles or pellets dispersed in air, gas, or liquid for the treatment of surfaces or cutting of materials, the particles usually being of abrasive material;
 - the equivalent use of a jet of particles or pellets projected or energised by means other than a stream of air.
2. In this subclass, the following terms are used with the meanings indicated:
 - "abrasive" covers any material used in the manner mentioned in Note (1) above;
 - "blast" covers any equivalent jet of material mentioned in Note (1) above.

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| 1/00 | Methods for use of abrasive blasting for producing particular effects; Use of auxiliary equipment in connection with such methods | 3/24 | • • • Apparatus using impellers |
| 1/02 | • for sharpening or cleaning cutting tools, e.g. files | 3/26 | • • the work being supported by barrel cages, i.e. tumblers; Gimbal mountings therefor |
| 1/04 | • for treating only selected parts of a surface, e.g. for carving stone or glass | 3/28 | • • • Apparatus using nozzles |
| 1/06 | • for producing matt surfaces, e.g. on plastic materials, on glass | 3/30 | • • • Apparatus using impellers |
| 1/08 | • for polishing surfaces, e.g. by making use of liquid-borne abrasives | 3/32 | • designed for abrasive blasting of particular work, e.g. the internal surfaces of cylinder blocks (B24C 3/08, B24C 3/18 take precedence) |
| 1/10 | • for compacting surfaces, e.g. shot-peening (for deforming sheet metal, tubes or profiles B21D 31/06; as a metallurgical treatment C21D 7/00, C22F 1/00) | 3/34 | • • for cleaning sparking plugs |

Accessories or equipment for abrasive blasting machines or devices

- | | | | |
|-------------|--|--------------|---|
| 3/00 | Abrasive blasting machines or devices; Plants | 5/00 | Devices or accessories for generating abrasive blasts |
| 3/02 | • characterised by the arrangement of the component assemblies with respect to each other (B24C 3/08, B24C 3/18 take precedence) | 5/02 | • Blast guns, e.g. for generating high velocity abrasive fluid jets for cutting materials [5] |
| 3/04 | • • stationary | 5/04 | • • Nozzles therefor (nozzles in general B05B) |
| 3/06 | • • movable; portable | 5/06 | • Impeller wheels; Rotor blades therefor |
| 3/08 | • essentially adapted for abrasive blasting of travelling stock or travelling workpieces | 5/08 | • Devices for generating abrasive blasts non-mechanically, e.g. of metallic abrasives by means of a magnetic field |
| 3/10 | • • for treating external surfaces | 7/00 | Equipment for feeding abrasive material; Controlling the flowability, constitution, or other physical characteristics of abrasive blasts |
| 3/12 | • • • Apparatus using nozzles | 9/00 | Appurtenances of abrasive blasting machines or devices, e.g. working chambers, arrangements for handling used abrasive material |
| 3/14 | • • • Apparatus using impellers | 11/00 | Selection of abrasive materials for abrasive blasts (polishing compositions C09G) |
| 3/16 | • • for treating internal surfaces | | |
| 3/18 | • essentially provided with means for moving workpieces into different working positions (B24C 3/08 takes precedence) | | |
| 3/20 | • • the work being supported by turntables | | |
| 3/22 | • • • Apparatus using nozzles | | |

B24D TOOLS FOR GRINDING, BUFFING, OR SHARPENING (tools for grinding or polishing optical surfaces on lenses or surfaces of similar shape B24B 13/01; grinding heads B24B 41/00; manufacture of abrasive or friction articles or shaped materials containing macromolecular substances C08J 5/14; polishing compositions C09G 1/00; abrasives C09K 3/14)

Note(s)

1. This subclass covers grinding tools for working on any material.
2. Tools for grinding, buffing or sharpening, specially designed for a particular purpose, which purpose is provided for in a single other place, are classified in that place, e.g. B23F 21/02.

Subclass index

PHYSICAL FEATURES OR CONSTITUENTS OF ABRASIVE BODIES OR SHEETS.....	3/00
ABRASIVE WHEELS.....	5/00, 7/00, 9/00, 13/00
FLEXIBLE ABRASIVE MATERIALS.....	11/00
HAND TOOLS.....	15/00
MANUFACTURE.....	18/00
OTHER TOOLS.....	99/00

3/00	Physical features of abrasive bodies, or sheets, e.g. abrasive surfaces of special nature; Abrasive bodies or sheets characterised by their constituents (composition of friction linings F16D 69/02)	7/00	Bonded abrasive wheels, or wheels with inserted abrasive blocks, designed for acting otherwise than only by their periphery, e.g. by the front face; Bushings or mountings therefor
3/02	• the constituent being used as bonding agent	7/02	• Wheels in one piece
3/04	• • and being essentially inorganic	7/04	• • with reinforcing means
3/06	• • • metallic	7/06	• with inserted abrasive blocks, e.g. segmental (zonally-graded B24D 7/14)
3/08	• • • • for close-grained structure, e.g. using metal with low melting point	7/08	• • with reinforcing means
3/10	• • • • for porous or cellular structure, e.g. for use with diamonds as abrasives	7/10	• with cooling provisions
3/12	• • • • water-setting, e.g. concrete	7/12	• with apertures for inspecting the surface to be abraded
3/14	• • • • ceramic, i.e. vitrified bondings	7/14	• Zonally-graded wheels; Composite wheels comprising different abrasives
3/16	• • • • for close grained structure, i.e. of high density	7/16	• Bushings; Mountings
3/18	• • • • for porous or cellular structure	7/18	• Wheels of special form (if specially designed for a particular purpose provided for in a single other class, that class takes precedence)
3/20	• • and being essentially organic		
3/22	• • • Rubbers		
3/24	• • • • for close-grained structure		
3/26	• • • • for porous or cellular structure		
3/28	• • • Resins		
3/30	• • • • for close-grained structure	9/00	Wheels or drums supporting in exchangeable arrangement a layer of flexible abrasive material, e.g. sandpaper (wheels or drums as machine elements F16)
3/32	• • • • for porous or cellular structure	9/02	• Expansible drums for carrying flexible material in tubular form, e.g. expanded by centrifugal force
3/34	• characterised by additives enhancing special physical properties, e.g. wear resistance, electric conductivity, self-cleaning properties	9/04	• Rigid drums for carrying flexible material
		9/06	• • able to be stripped-off from a built-in delivery spool
		9/08	• Circular back-plates for carrying flexible material
		9/10	• • with suction means for securing the material
		11/00	Constructional features of flexible abrasive materials; Special features in the manufacture of such materials
5/00	Bonded abrasive wheels, or wheels with inserted abrasive blocks, designed for acting only by their periphery; Bushings or mountings therefor	11/02	• Backings, e.g. foils, webs, mesh fabrics
5/02	• Wheels in one piece	11/04	• Zonally-graded surfaces
5/04	• • with reinforcing means	11/06	• Connecting the ends of materials, e.g. for making abrasive belts
5/06	• with inserted abrasive blocks, e.g. segmental (zonally graded B24D 5/14)	11/08	• Equipment for after-treatment of the coated backings, e.g. for flexing the coating
5/08	• • with reinforcing means		
5/10	• with cooling provisions, e.g. with radial slots	13/00	Wheels having flexibly-acting working parts, e.g. buffing wheels; Mountings therefor
5/12	• Cut-off wheels	13/02	• acting by their periphery
5/14	• Zonally-graded wheels; Composite wheels comprising different abrasives		
5/16	• Bushings; Mountings		

B24D

- 13/04 • • comprising a plurality of flaps or strips arranged around the axis
- 13/06 • • the flaps or strips being individually attached
- 13/08 • • comprising annular or circular sheets packed side by side
- 13/10 • • comprising assemblies of brushes
- 13/12 • • comprising assemblies of felted or spongy material, e.g. felt, steel wool, foamed latex
- 13/14 • acting by the front face
- 13/16 • • comprising pleated flaps or strips
- 13/18 • with cooling provisions
- 13/20 • Mountings for the wheels

15/00 Hand tools or other devices for non-rotary grinding, polishing, or stropping

- 15/02 • rigid; with rigidly-supported operative surface
- 15/04 • resilient; with resiliently-mounted operative surface
- 15/06 • specially designed for sharpening cutting edges
- 15/08 • • of knives; of razors
- 15/10 • • of safety-razor blades (devices with mechanically-operated parts B24B 3/50)

18/00 Manufacture of grinding tools, e.g. wheels, not otherwise provided for [4]**99/00 Subject matter not provided for in other groups of this subclass [2010.01]**