SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B24 GRINDING; POLISHING

B24B MACHINES, DEVICES, OR PROCESSES FOR GRINDING OR POLISHING (by electro-erosion B23H; abrasive or related blasting B24C; electrolytic etching or polishing C25F 3/00)**; 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.

Subclass index

GRINDING OR POLISHING PROCESSES NOT PARTICULAR TO SPECIFIC MACHINES, DEVICES OR WORK....1/00
GRINDING; GENERAL FEATURES OF GRINDING, POLISHING, OR FINISHING
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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 (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)

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
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 15/06)
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 **[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

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 **[4]**
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 **[4]**
7/08 • • having an abrasive wheel built in
7/10 • Single-purpose machines or devices
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 **[4]**
7/16 • • for grinding end faces, e.g. of gauges, rollers, nuts or piston rings (for combined grinding of surfaces of revolution and of adjacent plane surfaces on work B24B 5/01) **[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
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)
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
9/06 • • of non-metallic inorganic material, e.g. stone, ceramics, porcelain
9/08 • • • of glass
9/10 • • • • of plate glass
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
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]**
9/18 • • of wood
9/20 • • of plastics **[4]**

11/00 Machines or devices designed for grinding spherical surfaces or parts of spherical surfaces on work; Accessories therefor
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) **[2]**
13/005 • Blocking means, chucks or the like; Alignment devices **[4]**
13/01 • Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools **[4]**
13/015 • of televison picture tube viewing panels, headlight reflectors or the like **[4]**
13/02 • by means of tools with abrading surfaces corresponding in shape with the lenses to be made
13/04 • grinding of lenses involving grinding wheels controlled by gearing (B24B 13/06 takes precedence) **[4]**
13/06 • grinding of lenses, the tool or work being controlled by information carrying means, e.g. patterns, punched tapes, magnetic tapes **[4]**

15/00 Machines or devices designed for grinding seat surfaces; Accessories therefor
15/02 • in valve housings
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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17/00 Special adaptations of machines or devices for grinding controlled by patterns, drawings, magnetic tapes or the like; Accessories therefor [4]
17/02 • involving mechanical transmission means only
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 (grinding screw threads B23G 1/36)
19/02 • for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements **[4]**
19/03 • • for grinding grooves in glass workpieces, e.g. decorative grooves **[4]**
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 **[4]**
19/10 • • for grinding pistons
19/11 • • for grinding the circumferential surface of rings, e.g. piston rings **[4]**
19/12 • • for grinding cams or camshafts
19/14 • for grinding turbine blades, propeller blades or the like **[4]**
19/16 • for grinding sharp-pointed workpieces, e.g. needles, pens, fish hooks, tweezers or record player styli (polishing of needles B24B 29/08) **[4]**
19/18 • • for grinding carding equipment, e.g. card-clothings
19/20 • for grinding dies
19/22 • characterised by a special design with respect to properties of the material of non-metallic articles to be ground
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 **[4]**
19/28 • • for grinding shoes or linings of drum brakes **[4]**

21/00 Machines or devices using grinding or polishing belts (portable belt-grinding machines B24B 23/06)**; Accessories therefor [4]**
21/02 • for grinding rotationally symmetrical surfaces
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 **[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; dust extraction equipment B24B 55/10) **[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 (for grinding or polishing using belts B24B 21/00) **[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 (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 conveyor 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 adapted for machines covered by group B24B 31/00 **[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
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; Accessories (B24B 3/00 takes precedence) **[1, 2012.01]**
37/005 • Control means for lapping machines or devices **[2012.01]**
37/013 • • Devices or means for detecting lapping completion **[2012.01]**
37/015 • • Temperature control **[2012.01]**
37/02 • designed for working surfaces of revolution **[1, 2012.01]**
37/025 • • designed for working spherical surfaces **[2012.01]**
37/04 • designed for working plane surfaces **[1, 2012.01]**
37/07 • • characterised by the movement of the work or lapping tool **[2012.01]**
37/08 • • • for double side lapping **[2012.01]**
37/10 • • • for single side lapping **[2012.01]**
37/11 • Lapping tools **[2012.01]**
37/12 • • Lapping plates for working plane surfaces **[2012.01]**
37/14 • • • characterised by the composition or properties of the plate materials **[2012.01]**
37/16 • • • characterised by the shape of the lapping plate surface, e.g. grooved **[2012.01]**
37/20 • • Lapping pads for working plane surfaces **[2012.01]**
37/22 • • • characterised by a multi-layered structure **[2012.01]**
37/24 • • • characterised by the composition or properties of the pad materials **[2012.01]**
37/26 • • • characterised by the shape of the lapping pad surface, e.g. grooved **[2012.01]**
37/27 • Work carriers **[2012.01]**
37/28 • • for double side lapping of plane surfaces **[2012.01]**
37/30 • • for single side lapping of plane surfaces **[2012.01]**
37/32 • • • Retaining rings **[2012.01]**
37/34 • Accessories **[2012.01]**

39/00 Burnishing machines or devices, i.e. requiring pressure members for compacting the surface zone; 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 (B24B 37/27 takes precedence) **[1, 2012.01]**

45/00 Means for securing grinding wheels on rotary arbors

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, B24B 37/005 take precedence; if applicable to other machine tools, B23Q 15/00-B23Q 17/00 take precedence) **[1, 2012.01]**
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

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53/00 Devices or means for dressing or conditioning abrasive surfaces [4]

53/007 • Cleaning of grinding wheels **[4]**
53/013 • Application of loose grinding agent as auxiliary tool during truing operation **[4]**
53/017 • Devices or means for dressing, cleaning or otherwise conditioning lapping tools **[2012.01]**
53/02 • of plane surfaces on abrasive tools (B24B 53/017 takes precedence) **[1, 2012.01]**
53/04 • of cylindrical or conical surfaces on abrasive tools or wheels (B24B 53/017 takes precedence) **[4, 2012.01]**
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 **[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
55/02 • Equipment for cooling the grinding surfaces, e.g. devices for feeding coolant (incorporated in grinding wheels B24D) **[4]**
55/03 • • designed as a complete equipment for feeding or clarifying coolant **[4]**
55/04 • Protective covers for the grinding wheel
55/05 • • specially designed for portable grinding machines **[4]**
55/06 • Dust extraction equipment on grinding or polishing machines (B24B 31/12 takes precedence)
55/08 • • specially designed for belt grinding machines **[4]**
55/10 • • specially designed for portable grinding machines, e.g. hand-guided **[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]**

57/00 Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents (for abrasive blasting B24C 1/00, B24C 7/00) **[4]**
57/02 • for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents **[4]**
57/04 • for feeding of solid grinding, polishing or lapping agents **[4]**