

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)

- 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.
- 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

Grinding of surfaces with simple shapes.....5/00, 7/00, 9/00, 11/00

Grinding of surfaces of special shape.....3/00, 13/00-19/00

Grinding or polishing using abrasive belts.....21/00

Portable machines.....23/00

Other machines.....25/00, 27/00

Component parts.....41/00-47/00

Measuring, indicating, controlling; Safety.....49/00, 51/00, 55/00

Dressing or conditioning of grinding tools; Feeding or applying grinding, polishing or lapping agents.....53/00, 57/00

POLISHING OR FINISHING

Polishing, burnishing.....29/00, 39/00

by tumbling.....31/00

Honing, superfinishing.....33/00, 35/00

Lapping.....37/00

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

B24B

- 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 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
- 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	19/18	• • for grinding carding equipment, e.g. card-clothings
11/10	• • • of cup type	19/20	• for grinding dies
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]	19/22	• characterised by a special design with respect to properties of the material of non-metallic articles to be ground
13/005	• Blocking means, chucks or the like; Alignment devices [4]	19/24	• • of wood, e.g. furniture
13/01	• Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools [4]	19/26	• for grinding workpieces with arcuate surfaces, e.g. parts of car bodies, bumpers or magnetic recording heads [4]
13/015	• of television picture tube viewing panels, headlight reflectors or the like [4]	19/28	• • for grinding shoes or linings of drum brakes [4]
13/02	• by means of tools with abrading surfaces corresponding in shape with the lenses to be made	21/00	Machines or devices using grinding or polishing belts (portable belt-grinding machines B24B 23/06); Accessories therefor [4]
13/04	• grinding of lenses involving grinding wheels controlled by gearing (B24B 13/06 takes precedence) [4]	21/02	• for grinding rotationally symmetrical surfaces
13/06	• grinding of lenses, the tool or work being controlled by information carrying means, e.g. patterns, punched tapes, magnetic tapes [4]	21/04	• for grinding plane surfaces
15/00	Machines or devices designed for grinding seat surfaces; Accessories therefor	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)
15/02	• in valve housings	21/08	• • • Pressure shoes; Backing belts
15/03	• • using portable or mobile machines [4]	21/10	• • involving a rigid member, e.g. pressure bar, table, pressing or supporting the belt over substantially its whole span
15/04	• on valve members	21/12	• • involving a contact wheel or roller pressing the belt against the work
15/06	• on openings of bottles; on bottle stoppers or the like [4]	21/14	• • • Contact wheels; Contact rollers; Belt supporting rolls [4]
15/08	• for grinding co-operating seat surfaces by moving one over the other	21/16	• for grinding other surfaces of particular shape [4]
<hr/>		21/18	• Accessories
17/00	Special adaptations of machines or devices for grinding controlled by patterns, drawings, magnetic tapes or the like; Accessories therefor [4]	21/20	• • for controlling or adjusting the tracking or the tension of the grinding belt [4]
17/02	• involving mechanical transmission means only	21/22	• • for producing a reciprocation of the grinding belt normal to its direction of movement [4]
17/04	• involving optical auxiliary means, e.g. optical projection form grinding machines	23/00	Portable grinding machines, e.g. hand-guided; Accessories therefor (B24B 7/18 takes precedence; dust extraction equipment B24B 55/10) [4]
17/06	• • combined with electrical transmission means, e.g. controlled by photoelectric cells	23/02	• with rotating grinding tools; Accessories therefor
17/08	• involving fluid transmission means only	23/03	• • the tool being driven in a combined movement [4]
17/10	• involving electrical transmission means only, e.g. controlled by magnetic tape	23/04	• with oscillating grinding tools; Accessories therefor [4]
19/00	Single purpose machines or devices for particular grinding operations not covered by any other main group (grinding screw threads B23G 1/36)	23/06	• with abrasive belts, e.g. with endless travelling belts; Accessories therefor [4]
19/02	• for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements [4]	23/08	• Portable grinding machines designed for fastening on workpieces or other parts of particular section, e.g. for grinding commutators
19/03	• • for grinding grooves in glass workpieces, e.g. decorative grooves [4]	25/00	Grinding machines of universal type
19/04	• • for fluting drill shanks	27/00	Other grinding machines or devices
19/06	• • for grinding races, e.g. roller races	27/02	• Bench grinders [4]
19/08	• for grinding non-circular cross-sections, e.g. shafts of elliptical or polygonal cross-section	27/027	• having a flexible shaft [4]
19/09	• • for grinding trochoidal surfaces, e.g. in rotor housings of Wankel engines [4]	27/033	• for grinding a surface for cleaning purposes, e.g. for descaling or for grinding off flaws in the surface [4]
19/10	• • for grinding pistons	27/04	• • Grinding machines or devices in which the grinding tool is supported on a swinging arm
19/11	• • for grinding the circumferential surface of rings, e.g. piston rings [4]	27/06	• Grinders for cutting-off
19/12	• • for grinding cams or camshafts	27/08	• • being portable [4]
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]		

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 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 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	53/007	• Cleaning of grinding wheels [4]
47/04	• • by mechanical gearing only	53/013	• Application of loose grinding agent as auxiliary tool during truing operation [4]
47/06	• • by liquid or gas pressure only	53/017	• Devices or means for dressing, cleaning or otherwise conditioning lapping tools [2012.01]
47/08	• • by mechanical gearing combined with fluid systems	53/02	• of plane surfaces on abrasive tools (B24B 53/017 takes precedence) [1, 2012.01]
47/10	• for rotating or reciprocating working-spindles carrying grinding wheels or workpieces	53/04	• of cylindrical or conical surfaces on abrasive tools or wheels (B24B 53/017 takes precedence) [4, 2012.01]
47/12	• • by mechanical gearing or electric power (B24B 47/16 takes precedence)	53/047	• • equipped with one or more diamonds [4]
47/14	• • by liquid or gas pressure (B24B 47/16 takes precedence)	53/053	• • using a rotary dressing tool [4]
47/16	• • performing a reciprocating movement, e.g. during which the sense of rotation of the working-spindle is reversed	53/06	• of profiled abrasive wheels
47/18	• • for rotating the spindle at a speed adaptable to wear of the grinding wheel	53/065	• • having other than straight profiles, e.g. crowned (B24B 53/07 takes precedence) [4]
47/20	• relating to feed movement	53/07	• • by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls [4]
47/22	• Equipment for exact control of the position of the grinding tool or work at the start of the grinding operation	53/075	• • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/07 takes precedence) [4]
47/25	• for compensating grinding wheel abrasion resulting from dressing [4]	53/08	• • controlled by information means, e.g. patterns, templets, punched tapes or the like
47/26	• Accessories, e.g. stops	53/085	• • • for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms (B24B 53/09 takes precedence) [4]
47/28	• Equipment for preventing backlash	53/09	• • • having transfer elements formed as pantograph mechanism [4]
Measuring; Indicating; Controlling		53/095	• Cooling or lubricating during dressing operation [4]
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]	53/10	• of travelling flexible backings coated with abrasives; Cleaning of abrasive belts [4]
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]	53/12	• Dressing tools; Holders therefor [4]
49/03	• • according to the final size of the previously ground workpiece [4]	53/14	• • Dressing tools equipped with rotary rollers or cutters; Holders therefor [4]
49/04	• • involving measurement of the workpiece at the place of grinding during grinding operation [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
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]	55/02	• Equipment for cooling the grinding surfaces, e.g. devices for feeding coolant (incorporated in grinding wheels B24D) [4]
49/06	• • requiring comparison of the workpiece with standard gauging plugs, rings or the like	55/03	• • designed as a complete equipment for feeding or clarifying coolant [4]
49/08	• involving liquid or pneumatic means	55/04	• Protective covers for the grinding wheel
49/10	• involving electrical means (B24B 49/02, B24B 49/08 take precedence)	55/05	• • specially designed for portable grinding machines [4]
49/12	• involving optical means	55/06	• Dust extraction equipment on grinding or polishing machines (B24B 31/12 takes precedence)
49/14	• taking regard of the temperature during grinding	55/08	• • specially designed for belt grinding machines [4]
49/16	• taking regard of the load	55/10	• • specially designed for portable grinding machines, e.g. hand-guided [4]
49/18	• taking regard of the presence of dressing 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 [4]
51/00	Arrangements for automatic control of a series of individual steps in grinding a workpiece	57/00	Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents (for abrasive blasting B24C 1/00, B24C 7/00) [4]
53/00	Devices or means for dressing or conditioning abrasive surfaces [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]