

**CPC****COOPERATIVE PATENT CLASSIFICATION****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**

**NOTE**

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](#) to [B24B 27/00](#), in connection with glass the terms "grinding " and "polishing" are treated as being equivalent.

**B24B 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)

[B24B 1/002](#)

- . {using electric current ([B24B 37/046](#) and [B23H 5/08](#) take precedence)}

[B24B 1/005](#)

- . {using a magnetic polishing agent}

[B24B 1/007](#)

- . {abrasive treatment to obtain an aged or worn-out appearance}

[B24B 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](#))

**B24B 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](#), {[B23F 23/1225](#),} [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](#))

[B24B 3/003](#)

- . {for skate blades}

[B24B 3/006](#)

- . {for edges of skis, snowboards or the like}

[B24B 3/02](#)

- . of milling cutters

[B24B 3/021](#)

- .. {of milling cutters with helical cutting edges}

[B24B 3/022](#)

- .. {relief grinding of milling cutters}

[B24B 3/024](#)

- .. {Indexing equipment}

B24B 3/025	.. {Tooth rests; Supporting means for milling-cutter grinding machines}
B24B 3/027	.. {of milling cutters with embedded cutters}
B24B 3/028	.. {of tapered milling cutters}
B24B 3/04	.. of plain milling cutters
B24B 3/045	... {of milling cutters with helical cutting edges}
B24B 3/06	.. of face or end milling cutters or cutter heads, e.g. of shank type
B24B 3/065	... {end milling cutters with rounded ends}
B24B 3/08	.. of profile milling cutters, e.g. of disc type
B24B 3/085	... {using a template}
B24B 3/10	.. of routers or engraving needles
B24B 3/12	.. of hobs
B24B 3/14	.. of mortise chain cutters
B24B 3/16	. of broaches
B24B 3/18	. of taps or reamers
B24B 3/20	.. Tapering or chamfering taps or reamers
B24B 3/22	.. Relief cutting of taps or reamers
B24B 3/24	. of drills (by fluting the shank <a href="#">B24B 19/04</a> )
B24B 3/242	.. {of step drills}
B24B 3/245	.. {for simultaneously sharpening several drills; Supports therefor}
B24B 3/247	.. {Supports for drills ( <a href="#">B24B 3/245</a> takes precedence)}
B24B 3/26	.. of the point of twist drills
B24B 3/265	... {using devices specially adapted for domestic use}
B24B 3/28	... by swivelling the drill around an axis angularly to the drill axis
B24B 3/30	.... and rotating the drill about its own axis
B24B 3/32	... for thinning the point
B24B 3/33	.. of drills for stone
B24B 3/34	. of turning or planing tools or tool bits, e.g. gear cutters ( <a href="#">B24B 3/36</a> takes precedence)
B24B 3/343	.. {of throw-away cutting bits}
B24B 3/346	.. {of gear shaper cutter}
B24B 3/36	. of cutting blades ( <a href="#">B24B 3/58</a> takes precedence)
B24B 3/361	.. {of reciprocating blades}
B24B 3/363	.. {of blades mounted on a turning drum}
B24B 3/365	.. {of rotary mower blades}
B24B 3/366	.. {of meat mincing or meat grinding machines}
B24B 3/368	.. {installed as an accessory on another machine ( <a href="#">B26D 7/12</a> takes precedence)}
B24B 3/38	.. for planing wood, e.g. cutter blades
B24B 3/40	.. Processes or apparatus specially adapted for sharpening curved edges
B24B 3/42	.. helically bent, e.g. for lawn mowers
B24B 3/44	.. of scythes or sickles
B24B 3/46	.. of disc blades

B24B 3/463	... {of slicing machine disc blades}
B24B 3/466	... {of cultivator disc blades}
B24B 3/48	.. of razor blades or razors (by an abrasive block without mechanisms <a href="#">B24D</a> )
B24B 3/485	... {for travelling razor blades, in the form of a band or fitted on a transfer means}
B24B 3/50	... operated manually
B24B 3/52	.. of shear blades or scissors
B24B 3/54	.. of hand or table knives
B24B 3/543	... {using hand or foot driven tools}
B24B 3/546	... {the tool being driven in a non-rotary motion, e.g. oscillatory, gyratory}
B24B 3/55	. of knife bars for harvesting machines
B24B 3/56	. of slicing bands ( <a href="#">B24B 3/58</a> takes precedence)
B24B 3/58	. of tools having scalloped cutting edges
B24B 3/583	.. {of bands}
B24B 3/586	.. {of serrated edges, e.g. triangular shaped ( <a href="#">B24B 3/583</a> takes precedence)}
B24B 3/60	. of tools not covered by the preceding subgroups
B24B 3/602	.. {of thread cutting tools}
B24B 3/605	.. {of surgical or dental instruments}
B24B 3/607	.. {of files}

### **Grinding surfaces of particular forms**

<b>B24B 5/00</b>	<b>Machines or devices designed for grinding surfaces of revolution on work, including those which also grind adjacent plane surfaces; Accessories therefor (<a href="#">B24B 11/00</a> to <a href="#">B24B 21/00</a> take precedence; honing machines or devices using abrading blocks performing axial and rotary movements superimposed on one another <a href="#">B24B 33/00</a>)</b>
B24B 5/01	. for combined grinding of surfaces of revolution and of adjacent plane surfaces on work
B24B 5/02	. involving centres or chucks for holding work
B24B 5/025	.. {involving indexable work supporting means carrying several work pieces to be operated on in succession}
B24B 5/04	.. for grinding cylindrical surfaces externally ( <a href="#">grinding combined cylindrical and conical surfaces <a href="#">B24B 5/14</a></a> )
B24B 5/042	... {for grinding several workpieces at once using one grinding wheel}
B24B 5/045	... {with the grinding wheel axis perpendicular to the workpiece axis}
B24B 5/047	... {of workpieces turning about a vertical axis}
B24B 5/06	.. for grinding cylindrical surfaces internally ( <a href="#">B24B 5/40</a> takes precedence)
B24B 5/065	... {for brake drums}
B24B 5/08	... involving a vertical tool spindle
B24B 5/10	... involving a horizontal tool spindle
B24B 5/12	.. for grinding cylindrical surfaces both externally and internally with several grinding wheels
B24B 5/14	.. for grinding conical surfaces, e.g. of centres

- B24B 5/16 . . . for grinding peculiarly surfaces, e.g. bulged
- B24B 5/162 . . . {controlled by a template ([B24B 5/167](#) takes precedence)}
- B24B 5/165 . . . {controlled by gearing ([B24B 5/167](#) takes precedence)}
- B24B 5/167 . . . {for rolls with large curvature radius, e.g. mill rolls}
- B24B 5/18 . . involving centreless means for supporting, guiding, floating or rotating work  
([centreless turning B23B 5/08](#); [centreless grinding of threads B23G 1/42](#))
- B24B 5/185 . . {for internal surfaces}
- B24B 5/20 . . involving grooved abrading blocks
- B24B 5/22 . . for grinding cylindrical surfaces, e.g. on bolts
- B24B 5/225 . . . {for mass articles}
- B24B 5/24 . . for grinding conical surfaces
- B24B 5/245 . . . {for mass articles}
- B24B 5/26 . . for grinding peculiarly profiled surfaces, e.g. bulged
- B24B 5/28 . . for grinding outer surfaces concentrically to bores, involving additional centering means
- B24B 5/30 . . Regulating-wheels; Equipment therefor
- B24B 5/307 . . Means for supporting work
- B24B 5/313 . . involving work-supporting means carrying several workpieces to be operated on in succession
- B24B 5/32 . . the work-supporting means being indexable
- B24B 5/35 . . Accessories
- B24B 5/355 . . {Feeding means}
- B24B 5/36 . . Single-purpose machines or devices
- B24B 5/363 . . {for grinding surfaces of revolution in situ}
- B24B 5/366 . . {for grinding tyres}
- B24B 5/37 . . for grinding rolls, e.g. barrel-shaped rolls
- B24B 5/38 . . for externally grinding travelling elongated stock, e.g. wire
- B24B 5/40 . . for grinding tubes internally
- B24B 5/42 . . for grinding crankshafts or crankpins
- B24B 5/421 . . . {Supports therefor}
- B24B 5/423 . . . {having a grinding wheel turning around the workpiece}
- B24B 5/425 . . . {in situ}
- B24B 5/426 . . . {Portable devices therefor}
- B24B 5/428 . . . {Balancing means}
- B24B 5/44 . . for grinding rims of vehicle wheels, e.g. for bicycles
- B24B 5/46 . . for grinding railway car wheels
- B24B 5/48 . . for grinding walls of very fine holes, e.g. in drawing-dies
- B24B 5/485 . . . {using grinding wires or ropes}
- B24B 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](#))

<b>B24B 7/00</b>	<b>Machines or devices designed for grinding plane surfaces on work, including polishing plane glass surfaces; Accessories therefor</b> ( <a href="#">B24B 21/00</a> takes precedence; honing of plane surfaces on work <a href="#">B24B 33/055</a> )
<a href="#">B24B 7/005</a>	. {Portal grinding machines}
<a href="#">B24B 7/02</a>	. involving a reciprocatingly-moved work-table (involving a reciprocatingly-moved grinding wheel in combination with a stationary work-table <a href="#">B24B 7/07</a> )
<a href="#">B24B 7/04</a>	. involving a rotary work-table
<a href="#">B24B 7/06</a>	. involving conveyer belts, a sequence of travelling work-tables or the like
<a href="#">B24B 7/07</a>	. involving a stationary work-table
<a href="#">B24B 7/075</a>	.. {using a reciprocating grinding head mounted on a movable carriage}
<a href="#">B24B 7/08</a>	.. having an abrasive wheel built in
<a href="#">B24B 7/10</a>	. Single-purpose machines or devices (grinding tools or machines specially designed for use on assembled railway track <a href="#">E01B 31/17</a> )
<a href="#">B24B 7/12</a>	.. for grinding travelling elongated stock, e.g. strip-shaped work
<a href="#">B24B 7/13</a>	... grinding while stock moves from coil to coil
<a href="#">B24B 7/14</a>	.. for grinding slideways (portable grinding machines designed for fastening on workpieces <a href="#">B24B 23/08</a> )
<a href="#">B24B 7/16</a>	.. 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 <a href="#">B24B 5/01</a> ; for grinding edges of bevels on work <a href="#">B24B 9/00</a> )
<a href="#">B24B 7/162</a>	... {for mass articles}
<a href="#">B24B 7/165</a>	... {end faces of piston rings}
<a href="#">B24B 7/167</a>	... {end faces coil springs}
<a href="#">B24B 7/17</a>	... for simultaneously grinding opposite and parallel end faces, e.g. double disc grinders
<a href="#">B24B 7/18</a>	.. for grinding floorings, walls, ceilings or the like (machines or devices for cleaning floorings <a href="#">A47L 11/00</a> , <a href="#">A47L 13/00</a> )
<a href="#">B24B 7/182</a>	... {for walls and ceilings}
<a href="#">B24B 7/184</a>	.... {pole sanders}
<a href="#">B24B 7/186</a>	... {with disc-type tools}
<a href="#">B24B 7/188</a>	... {with cylinder- or belt-type tools}
<a href="#">B24B 7/19</a>	.. for grinding plane decorative patterns
<a href="#">B24B 7/20</a>	. characterised by a special design with respect to properties of the material of non-metallic articles to be ground
<a href="#">B24B 7/22</a>	.. for grinding inorganic material, e.g. stone, ceramics, porcelain
<a href="#">B24B 7/222</a>	... {for grinding vertical surfaces ( <a href="#">B24B 7/265</a> takes precedence)}
<a href="#">B24B 7/224</a>	... {Portal grinding machines; Machines having a tool movable in a plane}
<a href="#">B24B 7/226</a>	... {in which the tool is supported by the workpiece}
<a href="#">B24B 7/228</a>	... {for grinding thin, brittle parts, e.g. semiconductors, wafers (grinding edges of thin, brittle parts <a href="#">B24B 9/065</a> )}
<a href="#">B24B 7/24</a>	... for grinding or polishing glass
<a href="#">B24B 7/241</a>	.... {Methods}

B24B 7/242	....	{for plate glass}
B24B 7/244	.....	{continuous}
B24B 7/245	.....	{discontinuous}
B24B 7/247	....	{using reciprocating grinding tools}
B24B 7/248	.....	{high-frequency reciprocating tools, e.g. magnetically driven}
B24B 7/26	....	for simultaneously grinding or polishing opposite faces of continuously travelling sheets or bands
B24B 7/265	.....	{of vertical surfaces}
B24B 7/28	..	for grinding wood
B24B 7/30	..	for grinding plastics

**B24B 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](#))

B24B 9/002	.	{for travelling workpieces}
B24B 9/005	.	{for mass articles}
B24B 9/007	.	{for end faces of tubes (cleaning pipe ends or pipe fittings, e.g. before soldering <a href="#">B08B 9/021</a> )}
B24B 9/02	.	characterised by a special design with respect to properties of materials specific to articles to be ground
B24B 9/04	..	of metal, e.g. skate blades {( <a href="#">B24B 3/003</a> takes precedence)}
B24B 9/06	..	of non-metallic inorganic material, e.g. stone, ceramics, porcelain
B24B 9/065	...	{of thin, brittle parts, e.g. semiconductors, wafers}
B24B 9/08	...	of glass
B24B 9/085	....	{for watch glasses}
B24B 9/10	....	of plate glass
B24B 9/102	.....	{for travelling sheets}
B24B 9/105	.....	{using a template}
B24B 9/107	.....	{for glass plates while they are turning}
B24B 9/12	....	of hollow glassware, e.g. drinking glasses, preserve jars, television picture tube viewing panels
B24B 9/14	....	of optical work, e.g. lenses, prisms {(control of the position of the tool for bevelling optical work <a href="#">B24B 47/225</a> )}
B24B 9/142	.....	{for contact lenses}
B24B 9/144	.....	{the spectacles being used as a template}
B24B 9/146	.....	{Accessories, e.g. lens mounting devices}
B24B 9/148	.....	{electrically, e.g. numerically, controlled}
B24B 9/16	...	of diamonds; of jewels or the like; Diamond grinders` dops; Dop holders or tongs (for grinding sharp pointed diamonds or sapphires <a href="#">B24B 19/16</a> )
B24B 9/161	....	{Dops, dop holders}
B24B 9/162	....	{by bruting, i.e. rubbing two precious stones against each other}
B24B 9/163	....	{of gem stones or convex surfaces, cabochons}

B24B 9/164	....	{of diamond tools}
B24B 9/165	....	{for grinding cavities in gem stones}
B24B 9/166	....	{using heat}
B24B 9/167	....	{with means for turning and positioning the gem stones}
B24B 9/168	....	{grinding peripheral, e.g. conical or cylindrical, surfaces}
B24B 9/169	.....	{using templates}
B24B 9/18	..	of wood
B24B 9/20	..	of plastics

**B24B 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](#))

B24B 11/02	.	for grinding balls
B24B 11/04	..	involving grinding wheels
B24B 11/06	...	acting by the front faces, e.g. of plane, grooved or bevelled shape
B24B 11/08	...	acting by the circumference
B24B 11/10	...	of cup type

**B24B 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](#))

B24B 13/0006	.	{for intraocular lenses}
B24B 13/0012	.	{for multifocal lenses}
B24B 13/0018	.	{for plane optical surfaces}
B24B 13/0025	.	{for contact lenses}
B24B 13/0031	.	{Machines having several working posts; Feeding and manipulating devices}
B24B 13/0037	..	{the lenses being worked by different tools, e.g. for rough-grinding, fine-grinding, polishing}
B24B 13/0043	.	{the workpieces being deformed during the grinding operation}
B24B 13/005	.	Blocking means, chucks or the like; Alignment devices
B24B 13/0052	..	{Lens block moulding devices}
B24B 13/0055	..	{Positioning of lenses; Marking of lenses}
B24B 13/0057	..	{Deblocking of lenses}
B24B 13/01	.	Specific tools, e.g. bowl-like; Production, dressing or fastening of these tools
B24B 13/012	..	{conformable in shape to the optical surface, e.g. by fluid pressure acting on an elastic membrane}
B24B 13/015	.	of television picture tube viewing panels, headlight reflectors or the like
B24B 13/02	.	by means of tools with abrading surfaces corresponding in shape with the lenses to be made
B24B 13/023	..	{for grinding several lenses simultaneously}
B24B 13/026	..	{the contact between tool and workpiece being a line}
B24B 13/04	.	grinding of lenses involving grinding wheels controlled by gearing ( <a href="#">B24B 13/06</a> takes precedence)



- B24B 13/043 . . {using cup-type grinding wheels}
- B24B 13/046 . . {using a pointed tool or scraper-like tool ([B24B 13/015](#) and [B24B 13/065](#) take precedence)}
- B24B 13/06 . grinding of lenses, the tool or work being controlled by information-carrying means, e.g. patterns, punched tapes, magnetic tapes
- B24B 13/065 . . {using a template}
  
- B24B 15/00** **Machines or devices designed for grinding seat surfaces; Accessories therefor** ([for spherical surfaces in general \[B24B 11/00\]\(#\)](#))
- B24B 15/02 . in valve housings
- B24B 15/03 . . using portable or mobile machines
- B24B 15/04 . on valve members
- B24B 15/06 . on openings of bottles; on bottle stoppers or the like
- B24B 15/08 . for grinding co-operating seat surfaces by moving one over the other
  
- B24B 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**
- B24B 17/02 . involving mechanical transmission means only
- B24B 17/021 . . {using a pantograph}
- B24B 17/023 . . {using two or more templates}
- B24B 17/025 . . {for grinding rotating workpieces (three dimensional)}
- B24B 17/026 . . . {for the periphery of plane workpieces, e.g. cams, lenses}
- B24B 17/028 . . {using an abrasive belt}
- B24B 17/04 . involving optical auxiliary means, e.g. optical projection form grinding machines
- B24B 17/06 . . combined with electrical transmission means, e.g. controlled by photoelectric cells
- B24B 17/08 . involving fluid transmission means only
- B24B 17/10 . involving electrical transmission means only, e.g. controlled by magnetic tape
  
- B24B 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 \[B23G\]\(#\)](#))
- B24B 19/001 . {for table cutlery}
- B24B 19/002 . . {for knife blades ([sharpening table knife blades \[B24B 3/54\]\(#\)](#))}
- B24B 19/003 . {for the underframes of locomotives}
- B24B 19/004 . {for grinding rails, T, I, H or other similar profiles}
- B24B 19/005 . {for grinding skins or similar sheets}
- B24B 19/006 . {for grinding hollow glassware, bottles}
- B24B 19/007 . {for grinding buttons, nail heads, screw heads, bottle capsules or the like}
- B24B 19/008 . {for grinding ceramics, pottery, table ware}



- B24B 19/009 . {for grinding profiled workpieces using a profiled grinding tool}
- B24B 19/02 . for grinding grooves, e.g. on shafts, in casings, in tubes, homokinetic joint elements
- B24B 19/022 . . {for helicoidal grooves ([B24B 19/04](#) takes precedence)}
- B24B 19/024 . . . {on electrical resistances}
- B24B 19/026 . . {for checks for pilger rolls}
- B24B 19/028 . . {for microgrooves or oil spots}
- B24B 19/03 . . for grinding grooves in glass workpieces, e.g. decorative grooves
- B24B 19/04 . . for fluting drill shanks
- B24B 19/06 . . for grinding races, e.g. roller races
- B24B 19/08 . for grinding non-circular cross-sections, e.g. shafts of elliptical or polygonal cross-section
- B24B 19/09 . . for grinding trochoidal surfaces, e.g. in rotor housings of Wankel engines
- B24B 19/095 . . . {using templates}
- B24B 19/10 . . for grinding pistons
- B24B 19/11 . . for grinding the circumferential surface of rings, e.g. piston rings ([grinding end faces B24B 7/16](#), [B24B 7/17](#))
- B24B 19/12 . . for grinding cams or camshafts
- B24B 19/125 . . . {electrically controlled, e.g. numerically controlled}
- B24B 19/14 . for grinding turbine blades, propeller blades or the like ([using grinding belts B24B 21/16](#))
- B24B 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](#))
- B24B 19/165 . . {Phonograph needles and the like}
- B24B 19/18 . . for grinding carding equipment, e.g. card-clothings ([devices for sharpening card-clothings built in or attachable to carding machines D01G](#))
- B24B 19/20 . for grinding dies ([for grinding walls of very fine holes B24B 5/48](#))
- B24B 19/22 . characterised by a special design with respect to properties of the material of non-metallic articles to be ground
- B24B 19/223 . . {of paper or similar sheet material, e.g. perforating, cutting by means of a grinding wheel}
- B24B 19/226 . . {of the ends of optical fibres}
- B24B 19/24 . . of wood, e.g. furniture
- B24B 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](#))
- B24B 19/265 . . {for bumpers}
- B24B 19/28 . . for grinding shoes or linings of drum brakes ([of brake drum hubs B24B 5/06](#), of brake discs [B24B 7/17](#))
- B24B 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**
- B24B 21/002 . {for grinding edges or bevels}

- B24B 21/004 . {using abrasive rolled strips}
  - B24B 21/006 . {for special purposes, e.g. for television tubes, car bumpers}
  - B24B 21/008 . {Machines comprising two or more tools or having several working posts (B24B 21/006 takes precedence)}
  - B24B 21/02 . for grinding rotationally symmetrical surfaces
  - B24B 21/025 . . {for travelling elongated stock, e.g. wire}
  - B24B 21/04 . for grinding plane surfaces
  - B24B 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)
  - B24B 21/08 . . . Pressure shoes; {Pressure members, e.g.} backing belts
  - B24B 21/10 . . involving a rigid member, e.g. pressure bar, table, pressing or supporting the belt over substantially its whole span
  - B24B 21/12 . . involving a contact wheel or roller pressing the belt against the work
  - B24B 21/14 . . . Contact wheels; Contact rollers; Belt supporting rolls
  - B24B 21/16 . for grinding other surfaces of particular shape (single purpose machines for grinding cams or camshafts B24B 19/12)
  - B24B 21/165 . . {for vanes or blades of turbines, propellers, impellers, compressors and the like}
  - B24B 21/18 . Accessories
  - B24B 21/20 . . for controlling or adjusting the tracking or the tension of the grinding belt
  - B24B 21/22 . . for producing a reciprocation of the grinding belt normal to its direction of movement
- B24B 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)
- B24B 23/005 . {Auxiliary devices used in connection with portable grinding machines, e.g. holders}
  - B24B 23/02 . with rotating grinding tools; Accessories therefor
  - B24B 23/022 . . {Spindle-locking devices, e.g. for mounting or removing the tool}
  - B24B 23/024 . . {driven by hands or feet}
  - B24B 23/026 . . {Fluid driven}
  - B24B 23/028 . . {Angle tools}
  - B24B 23/03 . . the tool being driven in a combined movement
  - B24B 23/04 . with oscillating grinding tools; Accessories therefor
  - B24B 23/043 . . {reciprocatingly driven by a pneumatic or hydraulic piston}
  - B24B 23/046 . . {Clamping or tensioning means for abrasive sheets}
  - B24B 23/06 . with abrasive belts, e.g. with endless travelling belts; Accessories therefor
  - B24B 23/08 . Portable grinding machines designed for fastening on work-pieces or other parts of particular section, e.g. for grinding commutators

**B24B 25/00** **Grinding machines of universal type**

**B24B 27/00****Other grinding machines or devices**

- B24B 27/0007 . {Movable machines}
- B24B 27/0015 . {Hanging grinding machines}
- B24B 27/0023 . {grinding machines with a plurality of working posts}
- B24B 27/003 . {using a tool turning around the work-piece}
- B24B 27/0038 . {with the grinding tool mounted at the end of a set of bars}
- B24B 27/0046 . {Column grinding machines}
- B24B 27/0053 . {Radial grinding machines}
- B24B 27/0061 . {having several tools on a revolving tools box}
- B24B 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](#))}
- B24B 27/0076 . {grinding machines comprising two or more grinding tools}
- B24B 27/0084 . {the grinding wheel support being angularly adjustable}
- B24B 27/0092 . {Grinding attachments for lathes or the like}
- B24B 27/02 . Bench grinders
- B24B 27/027 . having a flexible shaft
- B24B 27/033 . for grinding a surface for cleaning purposes, e.g. for descaling or for grinding off flaws in the surface
- B24B 27/04 . . Grinding machines or devices in which the grinding tool is supported on a swinging arm
- B24B 27/06 . Grinders for cutting-off
- B24B 27/0608 . . {using a saw movable on slideways}
- B24B 27/0616 . . {using a tool turning around the workpiece}
- B24B 27/0625 . . {whereby the workpieces are radially fed by means of a turning drum}
- B24B 27/0633 . . {using a cutting wire}
- B24B 27/0641 . . {for grinding holes}
- B24B 27/065 . . {the saw being mounted on a pivoting arm}
- B24B 27/0658 . . {for cutting workpieces while they are turning about their longitudinal axis}
- B24B 27/0666 . . {the saw blade being arranged underneath a work-table}
- B24B 27/0675 . . {methods therefor}
- B24B 27/0683 . . {Accessories therefor}
- B24B 27/0691 . . . {for controlling the feeding or return movement of the saw}
- B24B 27/08 . . being portable
- B24B 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)

**B24B 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](#))

- B24B 29/005 . {using brushes}
- B24B 29/02 . designed for particular workpieces
- B24B 29/04 . . for rotationally symmetrical workpieces, e.g. ball-, cylinder- or cone-shaped workpieces
- B24B 29/06 . . for elongated workpieces having uniform cross-section in one main direction
- B24B 29/08 . . . the cross-section being circular, e.g. tubes, wires, needles
- B24B 29/10 . . for table cutlery
  
- B24B 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](#))
- B24B 31/003 . {whereby the workpieces are mounted on a holder and are immersed in the abrasive material}
- B24B 31/006 . {for grinding the interior surfaces of hollow workpieces}
- B24B 31/02 . involving rotary barrels
- B24B 31/0206 . . {for descaling wires travelling through the rotating drum}
- B24B 31/0212 . . {the barrels being submitted to a composite rotary movement}
- B24B 31/0218 . . . {the barrels are moving around two parallel axes, e.g. gyratory, planetary movement ([B24B 31/033](#) takes precedence)}
- B24B 31/0224 . . {the workpieces being fitted on a support}
- B24B 31/023 . . with tiltable axis
- B24B 31/027 . . with additional oscillating movement
- B24B 31/03 . . the workpieces being continuously-travelling
- B24B 31/033 . . having several rotating or tumbling drums with parallel axes
- B24B 31/037 . . having several rotating or tumbling drums with non-parallel axes {([B24B 31/0212](#), [B24B 31/0218](#) take precedence)}
- B24B 31/05 . involving a container formed as a conveyer belt
- B24B 31/06 . involving oscillating or vibrating containers
- B24B 31/062 . . {the workpieces travelling through the containers ([B24B 31/067](#), [B24B 31/073](#) take precedence)}
- B24B 31/064 . . {the workpieces being fitted on a support}
- B24B 31/067 . . involving a bowl formed as a straight through
- B24B 31/073 . . involving a bowl being ring- or spiral-shaped
- B24B 31/10 . involving other means for tumbling of work
- B24B 31/102 . . {using an alternating magnetic field}
- B24B 31/104 . . involving a rotating bowl, in which a ring zone of abrasive powder is formed by centrifugal force
- B24B 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
- B24B 31/112 . . using magnetically consolidated grinding powder, moved relatively to the workpiece under the influence of pressure
- B24B 31/116 . . using plastically deformable grinding compound, moved relatively to the workpiece under the influence of pressure

- B24B 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](#))
- B24B 31/14
  - . . Abrading-bodies specially designed for tumbling apparatus, e.g. abrading-balls
- B24B 31/16
  - . . Means for separating the workpiece from the abrasive medium at the end of operation
- B24B 33/00**
  - Honing machines or devices; Accessories therefor**
- B24B 33/02
  - . designed for working internal surfaces of revolution, e.g. of cylindrical or conical shapes
- B24B 33/022
  - . . {Horizontal honing machines}
- B24B 33/025
  - . . {Internal surface of conical shape}
- B24B 33/027
  - . . {using an unexpandable tool}
- B24B 33/04
  - . designed for working external surfaces of revolution
- B24B 33/05
  - . designed for working grooves, e.g. in gun barrels
- B24B 33/055
  - . designed for working plane surfaces
- B24B 33/06
  - . with controlling or gauging equipment ([gauging in general G01B](#); [controlling in general G05](#))
- B24B 33/08
  - . Honing tools {(for manufacturing gear teeth [B23F 21/03](#))}
- B24B 33/081
  - . . {for external surfaces}
- B24B 33/082
  - . . {having only one honing stone}
- B24B 33/083
  - . . {with different sets of honing stones}
- B24B 33/084
  - . . {having honing stones at the end of bars}
- B24B 33/085
  - . . {in which the honing element consists of a deformable body}
- B24B 33/086
  - . . {Abrading blocks for honing tools}
- B24B 33/087
  - . . {provided with measuring equipment}
- B24B 33/088
  - . . {for holes having a shape other than cylindrical}
- B24B 33/089
  - . . {with a rack-and-pinion mechanism for expanding the honing segments}
- B24B 33/10
  - . Accessories
- B24B 33/105
  - . . {Honing spindles; Devices for expanding the honing elements ([B24B 33/04](#) takes precedence)}
- B24B 35/00**
  - Machines or devices designed for superfinishing surfaces on work, i.e. by means of abrading blocks reciprocating with high frequency**
- B24B 35/005
  - . {for making three-dimensional objects (by electroerosion [B23H 5/04](#))}
- B24B 37/00**
  - Lapping machines or devices; Accessories ([B24B 3/00](#) takes precedence)**
- B24B 37/005
  - . Control means for lapping machines or devices
- B24B 37/0053
  - . . {detecting loss or breakage of a workpiece during lapping}
- B24B 37/0056
  - . . {taking regard of the pH-value of lapping agents}
- B24B 37/013
  - . . Devices or means for detecting lapping completion
- B24B 37/015
  - . . Temperature control
- B24B 37/02
  - . designed for working surfaces of revolution

- B24B 37/022 .. {characterised by the movement of the work between two lapping plates}
- B24B 37/025 .. designed for working spherical surfaces
- B24B 37/04 . designed for working plane surfaces
- B24B 37/042 .. {operating processes therefor}
- B24B 37/044 ... {characterised by the composition of the lapping agent}
- B24B 37/046 .. {using electric current}
- B24B 37/048 .. {of sliders and magnetic heads of hard disc drives or the like}
- B24B 37/07 .. characterised by the movement of the work or lapping tool
- B24B 37/08 ... for double side lapping
- B24B 37/10 ... for single side lapping
- B24B 37/102 .... {the workpieces or work carriers being able to rotate freely due to a frictional contact with the lapping tool}
- B24B 37/105 .... {the workpieces or work carriers being actively moved by a drive, e.g. in a combined rotary and translatory movement}
- B24B 37/107 ..... {in a rotary movement only, about an axis being stationary during lapping}
- B24B 37/11 . Lapping tools
- B24B 37/12 .. Lapping plates for working plane surfaces
- B24B 37/14 ... characterised by the composition or properties of the plate materials
- B24B 37/16 ... characterised by the shape of the lapping plate surface, e.g. grooved
- B24B 37/20 .. Lapping pads for working plane surfaces
- B24B 37/205 ... {provided with a window for inspecting the surface of the work being lapped}
- B24B 37/22 ... characterised by a multi-layered structure
- B24B 37/24 ... characterised by the composition or properties of the pad materials
- B24B 37/245 .... {Pads with fixed abrasives}
- B24B 37/26 ... characterised by the shape of the lapping pad surface, e.g. grooved
- B24B 37/27 . Work carriers
- B24B 37/28 .. for double side lapping of plane surfaces
- B24B 37/30 .. for single side lapping of plane surfaces
- B24B 37/32 ... Retaining rings
- B24B 37/34 . Accessories
- B24B 37/345 .. {Feeding, loading or unloading work specially adapted to lapping}
  
- B24B 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 39/003 . {the working tool being composed of a plurality of working rolls or balls (see also [B24B 39/023](#), [B24B 39/045](#))}
- B24B 39/006 . {Peening and tools therefor}
- B24B 39/02 . designed for working internal surfaces of revolution
- B24B 39/023 .. {the working tool being composed of a plurality of working rolls or balls (see also [B24B 39/003](#), [B24B 39/045](#))}
- B24B 39/026 .. {Impact burnishing}

- B24B 39/04 . designed for working external surfaces of revolution
- B24B 39/045 . . {the working tool being composed of a plurality of working rolls or balls (see also [B24B 39/003](#), [B24B 39/045](#))}
- B24B 39/06 . designed for working plane surfaces
- B24B 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)

#### **B24B 41/00**

#### **Component parts such as frames, beds, carriages, headstocks**

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

#### **B24B 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](#))

- B24B 45/003 . {Accessories therefor}
- B24B 45/006 . {Quick mount and release means for disc-like wheels, e.g. on power tools}

#### **B24B 47/00**

#### **Drives or gearings; Equipment therefor**

- B24B 47/02 . for performing a reciprocating movement of carriages or work- tables
- B24B 47/04 . . by mechanical gearing only
- B24B 47/06 . . by liquid or gas pressure only
- B24B 47/08 . . by mechanical gearing combined with fluid systems



- B24B 47/10 . for rotating or reciprocating working-spindles carrying grinding wheels or workpieces
- B24B 47/12 . . by mechanical gearing or electric power ([B24B 47/16 takes precedence](#))
- B24B 47/14 . . by liquid or gas pressure ([B24B 47/16 takes precedence](#))
- B24B 47/16 . . performing a reciprocating movement, e.g. during which the sense of rotation of the working-spindle is reversed
- B24B 47/18 . . for rotating the spindle at a speed adaptable to wear of the grinding wheel
- B24B 47/20 . relating to feed movement
- B24B 47/203 . . {driven by hand}
- B24B 47/206 . . {for centreless grinding machines; for machines comprising work supports, e.g. steady rests}
- B24B 47/22 . Equipment for exact control of the position of the grinding tool or work at the start of the grinding operation
- B24B 47/225 . . {for bevelling optical work, e.g. lenses}
- B24B 47/25 . for compensating grinding wheel abrasion resulting from dressing
- B24B 47/26 . Accessories, e.g. stops
- B24B 47/28 . Equipment for preventing backlash

### **Measuring; Indicating; Controlling**

- B24B 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)**
- B24B 49/003 . {involving acoustic means}
- B24B 49/006 . {taking regard of the speed}
- B24B 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](#))
- B24B 49/03 . . according to the final size of the previously ground workpiece
- B24B 49/04 . . involving measurement of the workpiece at the place of grinding during grinding operation
- B24B 49/045 . . . {Specially adapted gauging instruments}
- B24B 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
- B24B 49/06 . . requiring comparison of the workpiece with standard gauging plugs, rings or the like
- B24B 49/08 . involving liquid or pneumatic means
- B24B 49/10 . involving electrical means ([B24B 49/02](#), [B24B 49/08 take precedence](#))
- B24B 49/105 . . {using eddy currents}
- B24B 49/12 . involving optical means
- B24B 49/14 . taking regard of the temperature during grinding
- B24B 49/16 . taking regard of the load
- B24B 49/165 . . {for grinding tyres}

B24B 49/18	. taking regard of the presence of dressing tools
B24B 49/183	.. {Wear compensation without the presence of dressing tools}
B24B 49/186	.. {taking regard of the wear of the dressing tools}
<b>B24B 51/00</b>	<b>Arrangements for automatic control of a series of individual steps in grinding a workpiece</b> (if applicable to other machine tools, <a href="#">G05B</a> takes precedence)
<b>B24B 53/00</b>	<b>Devices or means for dressing or conditioning abrasive surfaces</b> (compensation for grinding wheel abrasion resulting from dressing <a href="#">B24B 47/25</a> )
B24B 53/001	. {involving the use of electric current}
B24B 53/003	. {using at least two conditioning tools}
B24B 53/005	. {Positioning devices for conditioning tools}
B24B 53/007	. Cleaning of grinding wheels
B24B 53/013	. Application of loose grinding agent as auxiliary tool during truing operation
B24B 53/017	. Devices or means for dressing, cleaning or otherwise conditioning lapping tools
B24B 53/02	. of plane surfaces on abrasive tools ( <a href="#">B24B 53/017</a> takes precedence)
B24B 53/04	. of cylindrical or conical surfaces on abrasive tools or wheels ( <a href="#">B24B 53/017</a> takes precedence)
B24B 53/047	.. equipped with one or more diamonds
B24B 53/053	.. using a rotary dressing tool
B24B 53/06	. of profiled abrasive wheels
B24B 53/062	.. {using rotary dressing tools ( <a href="#">B24B 53/07</a> takes precedence)}
B24B 53/065	.. having other than straight profiles, e.g. crowned ( <a href="#">B24B 53/07</a> takes precedence)
B24B 53/07	.. by means of forming tools having a shape complementary to that to be produced, e.g. blocks, profile rolls
B24B 53/075	.. for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms ( <a href="#">B24B 53/07</a> takes precedence)
B24B 53/08	.. controlled by information means, e.g. patterns, templets, punched tapes or the like
B24B 53/081	... {by means of a template}
B24B 53/082	.... {for tools having a screw-thread profile}
B24B 53/083	... {for tools having a screw-thread profile ( <a href="#">B24B 53/081</a> takes precedence)}
B24B 53/085	... for workpieces having a grooved profile, e.g. gears, splined shafts, threads, worms {( <a href="#">B24B 53/082</a> , <a href="#">B24B 53/083</a> , <a href="#">B24B 53/09</a> take precedence)}
B24B 53/09	... having transfer elements formed as pantograph mechanism
B24B 53/095	. Cooling or lubricating during dressing operation ( <a href="#">cooling the grinding surfaces B24B 55/02</a> )
B24B 53/10	. of travelling flexible backings coated with abrasives; Cleaning of abrasive belts
B24B 53/12	. Dressing tools; Holders therefor
B24B 53/14	.. Dressing tools equipped with rotary rollers or cutters; Holders therefor
<b>B24B 55/00</b>	<b>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</b> (of general applicability for machine tools <a href="#">B23Q 11/00</a> ; in general <a href="#">F16P</a> )

- B24B 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](#))
- B24B 55/03 . . designed as a complete equipment for feeding or clarifying coolant
- B24B 55/04 . Protective covers for the grinding wheel
- B24B 55/045 . . {with cooling means incorporated}
- B24B 55/05 . . specially designed for portable grinding machines
- B24B 55/052 . . . {with rotating tools}
- B24B 55/055 . . . {with oscillating tools}
- B24B 55/057 . . . {with belt-like tools}
- B24B 55/06 . Dust extraction equipment on grinding or polishing machines ([B24B 31/12 takes precedence](#))
- B24B 55/08 . . specially designed for belt grinding machines
- B24B 55/10 . . specially designed for portable grinding machines, e.g. hand-guided
- B24B 55/102 . . . {with rotating tools}
- B24B 55/105 . . . {with oscillating tools}
- B24B 55/107 . . . {with belt-like tools}
- B24B 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
- B24B 57/00** **Devices for feeding, applying, grading or recovering grinding, polishing or lapping agents** ([for abrasive blasting B24C 1/00](#), [B24C 7/00](#))
- B24B 57/02 . for feeding of fluid, sprayed, pulverised, or liquefied grinding, polishing or lapping agents
- B24B 57/04 . for feeding of solid grinding, polishing or lapping agents