

SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

B23P OTHER WORKING OF METAL; COMBINED OPERATIONS; UNIVERSAL MACHINE TOOLS (arrangements for copying or controlling B23Q)

Note(s)

1. This subclass does not cover non-mechanical operations on non-metallic materials unless such operations are specially mentioned in this subclass.
2. In this subclass, the following expressions are used with the meanings indicated:
 - "combined operations" excludes the assembling of parts if it is an essential feature of the next metal-working operation, since it is not regarded as an operation per se;
 - "working of metal" and equivalent expressions include non-mechanical treatment of metal so far as it is not provided for in any other class or subclass, for example, in C21D, C22C, C22F, C23. Thus, combinations of such non-mechanical treatment with other metal-working are classified in this subclass.
3. Attention is drawn to the Notes following the title of class B23.

Subclass index

METAL-WORKING PROCESSES

Setting of diamonds.....	5/00
Reconditioning; finishing.....	6/00, 9/00
Connecting or disconnecting.....	11/00, 19/00, 21/00
Other processes.....	6/00, 13/00, 15/00, 17/00
Auxiliary treatments.....	25/00

COMBINED PROCESSES; MULTI-PURPOSE MACHINES

Reconditioning; finishing.....	6/00, 9/00
Other combined operations.....	6/00, 23/00
Auxiliary treatments.....	25/00

5/00	Setting gems or the like on metal parts, e.g. diamonds on tools	11/00	Connecting or disconnecting metal parts or objects by metal-working techniques, not otherwise provided for (connecting sheet metal or metal tubes, rods or profiles B21D 39/00; riveting B21J; soldering, unsoldering, welding B23K; hand tools for connecting wire or strip B25B 25/00; connecting metal parts by adhesives F16B 11/00) [1, 7]
6/00	Restoring or reconditioning objects (straightening or restoring form of sheet metal, metal rods, metal tubes, metal profiles, or specific articles made therefrom B21D 1/00, B21D 3/00; repairing defective or damaged objects by casting techniques B22D 19/10; procedures or apparatus covered by a single other subclass, <u>see</u> the relevant subclass) [3]	11/02	• by first expanding and then shrinking or <u>vice versa</u> , e.g. by using pressure fluids; by making force fits
6/02	• Pistons or cylinders [3]	13/00	Making metal objects by operations essentially involving machining but not covered by a single other subclass (making specific objects B23P 15/00)
6/04	• Repairing fractures or cracked metal parts or products, e.g. castings [3]	13/02	• in which only the machining operations are important
9/00	Treating or finishing surfaces mechanically, with or without calibrating, primarily to resist wear or impact, e.g. smoothing or roughening turbine blades or bearings (treatment covered by a single other subclass, <u>see</u> the relevant subclass, e.g. B24C, C21D 7/00, C22F 1/00); Features of such surfaces not otherwise provided for, their treatment being unspecified	13/04	• involving slicing of profiled material
9/02	• Treating or finishing by applying pressure, e.g. knurling (B23P 9/04 takes precedence)	15/00	Making specific metal objects by operations not covered by a single other subclass or a group in this subclass
9/04	• Treating or finishing by hammering or applying repeated pressure	15/02	• turbine or like blades from one piece
		15/04	• turbine or like blades from several pieces
		15/06	• piston rings from one piece
		15/08	• piston rings from several pieces
		15/10	• pistons
		15/12	• gratings
		15/14	• gear parts, e.g. gear wheels

B23P

- 15/16 • plates with holes of very small diameter e.g. for spinning or burner nozzles
- 15/18 • brake shoes
- 15/20 • railroad requirements, e.g. buffers
- 15/22 • cartridges or like shells
- 15/24 • dies (B21C 3/18, B21C 25/10, B21D 37/20 take precedence)
- 15/26 • heat exchangers
- 15/28 • cutting tools (sawing tools B23D 63/00, B23D 65/00; files or rasps B23D 73/00)
- 15/30 • • lathes or like tools
- 15/32 • • twist-drills
- 15/34 • • milling cutters
- 15/36 • • • for thread cutting
- 15/38 • • planing or slotting tools (B23P 15/30 takes precedence)
- 15/40 • • shearing tools
- 15/42 • • broaching tools
- 15/44 • • scraping or shaving tools
- 15/46 • • reaming tools
- 15/48 • • threading tools (milling cutters for thread-cutting B23P 15/36)
- 15/50 • • • dies
- 15/52 • • • taps
- 17/00 Metal-working operations, not covered by a single other subclass or another group in this subclass**
- 17/02 • Single metal-working processes; Machines or apparatus therefor
- 17/04 • characterised by the nature of the material involved or the kind of product independently of its shape
- 17/06 • • Making steel wool or the like
- 19/00 Machines for simply fitting together or separating metal parts or objects, or metal and non-metal parts, whether or not involving some deformation; Tools or devices therefor so far as not provided for in other classes (hand tools in general B25) [3]**
- 19/02 • for connecting objects by press fit or for detaching same (B23P 19/10 takes precedence) [1, 7]
- 19/027 • • using hydraulic or pneumatic means (B23P 19/033 takes precedence) [7]
- 19/033 • • using vibration [7]
- 19/04 • for assembling or disassembling parts (B23P 19/10 takes precedence) [1, 7]
- 19/06 • • Screw or nut setting or loosening machines
- 19/08 • • Machines for placing washers, circlips, or the like on bolts or other members
- 19/10 • Aligning parts to be fitted together [7]
- 19/12 • • Alignment of parts for insertion into bores [7]
- 21/00 Machines for assembling a multiplicity of different parts to compose units, with or without preceding or subsequent working of such parts, e.g. with programme control**
- 23/00 Machines or arrangements of machines for performing specified combinations of different metal-working operations not covered by a single other subclass** (combined horizontal boring and milling machines B23B 39/02; if the particular kinds of operation are not essential B23Q 37/00-B23Q 41/00; features relating to operations covered by a single subclass, see the relevant subclass for the operation)
- 23/02 • Machine tools for performing different machining operations (lathes, e.g. capstan lathes, B23B)
- 23/04 • for both machining and other metal-working operations
- 23/06 • Metal-working plant comprising a number of associated machines or apparatus
- 25/00 Auxiliary treatment of workpieces, before or during machining operations, to facilitate the action of the tool or the attainment of a desired final condition of the work, e.g. relief of internal stress**