CPC  COOPERATIVE PATENT CLASSIFICATION

B  PERFORMING OPERATIONS; TRANSPORTING
   (NOTES omitted)

SHAPING

B23  MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR
     (NOTES omitted)

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

NOTES
1. This subclass covers:
   • combinations of work-modifying operations covered by different subclasses of classes B21 - B24;
   • combinations of metal-working operations with non-mechanical treatments of metal not provided for elsewhere, for example in C21D, C22C, C22F or C23.
2. This subclass does not cover
   • non-mechanical operations on non-metallic materials unless such operations are specially mentioned in this subclass;
   • subsidiary operations performed in conjunction with main operations covered by a single subclass, e.g. assembling of parts as an essential feature of a following metal-working operation, since they are not regarded as operations per se.
3. Attention is drawn to the Notes following the title of class B23.

WARNING
In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

5/00  Setting gems or the like on metal parts, e.g. diamonds on tools
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, see the relevant subclass)
   6/002  . {Repairing turbine components, e.g. moving or stationary blades, rotors, (B23P 6/045 takes precedence)}
   6/005  . . {using only replacement pieces of a particular form}
   6/007  . . {using only additive methods, e.g. build-up welding}
   6/02  . Pistons or cylinders
   6/04  . Repairing fractures or cracked metal parts or products, e.g. castings
   6/045  . . {of turbine components, e.g. moving or stationary blades, rotors, etc.}
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, see the relevant subclass, e.g. B24C, C21D 7/00, C22F 1/00); Features of such surfaces not otherwise provided for, their treatment being unspecified
   9/02  . Treating or finishing by applying pressure, e.g. knurling (B23P 9/04 takes precedence)
9/025  . . {to inner walls of holes by using axially moving tools}
9/04  . Treating or finishing by hammering or applying repeated pressure
11/00  Connecting metal parts or objects by metal-working techniques, not covered wholly by either B21J or B23K (connecting sheet metal or metal tubes, rods, or profiles B21D 39/00; objects produced by methods not important per se, see the relevant subclasses dealing with the objects, e.g. B21F 5/00; B21L 19/00); hand tools for connecting wire or strip B25B 25/00; connecting metal parts by adhesives F16B 11/00
   11/005  . {by expanding or crimping}
   11/02  . by first expanding and then shrinking or vice versa, e.g. by using pressure fluids; by making force fits
   11/022  . . {by using pressure fluids}
   11/025  . . {by using heat or cold}
   11/027  . . . {for mounting tools in tool holders}
13/00  Making metal objects by operations essentially involving machining but not covered by a single other subclass (making specific objects B23P 15/00)
   13/02  . in which only the machining operations are important
   13/04  . involving slicing of profiled material
15/00  Making specific metal objects by operations not covered by a single other subclass or a group in this subclass
   15/001  . . {valves or valve housings (welding B23K; valve housings per se F16K)}
   15/002  . . {poppet valves}
metal parts, or metal and non-metal parts, machines for simply fitting together or separating parts (see also B23K, B21J, B21D)

Machines for placing washers, circlips, or the like (for placing resilient or flexible rings, e.g. O-rings, circlips)
19/107 . . {using oscillating, rotating or vibrating movements}
19/12 . . Alignment of parts for insertion into bores

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
21/002 . . [the units stationary whilst being composed]
21/004 . . [the units passing two or more work-stations whilst being composed]
21/006 . . [the conveying means comprising a rotating table]
21/008 . . [the assembling machines or tools moving synchronously with the units while these are being assembled]

23/00 Machines or arrangements of machines for performing specified combinations of different metal-working operations not covered by a single other subclass (if the particular kinds of operation are not essential B23Q 37/00 - B23Q 41/00: {working by laser beam combined with other working of metal B23K 26/0093})
23/02 . . Machine tools for performing different machining operations (lathes, e.g. capstan lathes, B23B; combined horizontal boring and milling machines B23B 39/02)
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
25/003 . . [immediately preceding a cutting tool]
25/006 . . . [Heating the workpiece by laser during machining]

2700/00 Indexing scheme relating to the articles being treated, e.g. manufactured, repaired, assembled, connected or other operations covered in the subgroups
2700/01 . . Aircraft parts
2700/02 . . Camshafts
2700/03 . . Catalysts or parts thereof
2700/04 . . Connecting rods
2700/05 . . Cooking vessels
2700/06 . . Cooling passages of turbine components, e.g. unblocking or preventing blocking of cooling passages of turbine components
2700/07 . . Crankshafts
2700/08 . . Fittings for doors and windows of buildings
2700/09 . . Heat pipes
2700/10 . . Heat sinks
2700/11 . . Joints, e.g. ball joints, universal joints
2700/12 . . Laminated parts
2700/13 . . Parts of turbine combustion chambers
2700/14 . . Suspension elements of automobile vehicles
2700/50 . . Other automobile vehicle parts, i.e. manufactured in assembly lines