COOPERATIVE PATENT CLASSIFICATION

PERFORMING OPERATIONS; TRANSPORTING

SHAPING

MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

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 15/00, B21L 19/00; hand tools for connecting wire or strip B23B 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]
19/00 Machines for simply fitting together or separating
metal parts, or metal and non-metal parts, whether or not involving some deformation (connecting metal parts or objects by metal-working procedures B23P 11/00; B21J, B23K); Tools or devices therefor so far as not provided for in other classes (hand tools in general B25)
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