PERFORMING OPERATIONS; TRANSPORTING

COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

B21 SHAPING

MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL (casting, powder metallurgy B22; shearing B23D; working of metal by the action of a high concentration of electric current B23H; soldering, welding, flame-cutting B23K; other working of metal B23P; punching sheet material in general B26F; processes for changing of physical properties of metals C21D, C22F; electroforming C25D 1/00)

(NOTES omitted)

WORKING OR PROCESSING OF SHEET METAL OR METAL TUBES, RODS OR PROFILES WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL (working or processing of wire B21F)

NOTES

1. This subclass covers cutting or perforating of sheet metal or other stock material
2. This subclass does not cover the working of metal foils in a manner analogous to the working of paper, which is covered by classes B26, B31

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.

Straightening: Restoring form; Bending; Corrugating; Flanging

1/00 Straightening, restoring form or removing local distortions of sheet metal or specific articles made therefrom (B21D 3/00 takes precedence); Stretching sheet metal combined with rolling (working sheet metal of limited length by stretching B21D 25/00; by localised hammering B21D 31/06)

1/02 . by rollers (B21D 1/06 takes precedence)
1/05 . Stretching combined with rolling
1/06 . Removing local distortions
1/065 . . [by hammering]
1/08 . . of hollow bodies made from sheet metal (of substantially open bodies B21D 1/10 ; flattening hollow objects for transport and reforming B21D 51/14)

1/10 . . of specific articles made from sheet metal, e.g. mudguards
1/12 . Straightening vehicle body parts or bodies (B21D 1/14 takes precedence)
1/14 . Straightening frame structures
1/145 . . [Clamps therefor]

3/00 Straightening or restoring form of metal rods, metal tubes, metal profiles, or specific articles made therefrom, whether or not in combination with sheet metal parts (straightening of well casings in situ E21B; straightening rails or rail joints E01B 31/08)

3/005 . . [by eccentric turning members]
3/02 . by rollers

3/04 . . arranged on axes skew to the path of the work
3/045 . . . [Workpiece feed channels therefor]
3/05 . . arranged on axes rectangular to the path of the work
3/06 . . which move inclined to a revolving flier rolling frame
3/08 . . which move in an orbit without rotating round the work
3/10 . between rams and anvils or abutments
3/12 . by stretching with or without twisting (by twisting only B21D 11/14)
3/14 . Recontouring
3/16 . of specific articles made from metal rods, tubes, or profiles, e.g. crankshafts, by specially adapted methods or means

5/00 Bending sheet metal along straight lines, e.g. to form simple curves (B21D 11/06 - B21D 11/18 take precedence; corrugating sheet metal B21D 13/00; as edge treatment B21D 19/00)

5/002 . . [Positioning devices]
5/004 . . [with program control]
5/006 . . [combined with measuring of bends]
5/008 . . [combined with heating or cooling of the bends]
5/01 . between rams and anvils or abutments
5/015 . . . [for making tubes]
5/02 . on press brakes without making use of clamping means
5/0209 . . . [Tools therefor]
5/0218 . . . [Length adjustment of the punch]
Straightening; Restoring form; Bending; Corrugating; Flanging

5/0227 . . . [Length adjustment of the die]
5/0236 . . . [Tool clamping]
5/0245 . . . [Fluid operated]
5/0254 . . . [Tool exchanging]
5/0263 . . . [Die with two oscillating halves]
5/0272 . . . [Deflection compensating means]
5/0281 . . . [Workpiece supporting devices]
5/029 . . . [with shearing devices]
5/04 . . . on brakes making use of clamping means on one side of the work
5/042 . . . [With a rotational movement of the bending blade]
5/045 . . . [With a wiping movement of the bending blade]
5/047 . . . [Length adjustment of the clamping means]
5/06 . . . by drawing procedure making use of dies or forming-rollers, e.g. making profiles
5/08 . . . making use of forming-rollers (B21D 5/12 takes precedence)
5/083 . . . [for obtaining profiles with changing cross-sectional configuration]
5/086 . . . [for obtaining closed hollow profiles]
5/10 . . . for making tubes
5/12 . . . making use of forming-rollers
5/14 . . . by passing between rollers (B21D 5/06 takes precedence)
5/143 . . . [making use of a mandrel]
5/146 . . . [one roll being covered with deformable material]
5/16 . . . Folding; Pleating

7/00 Bending rods, profiles, or tubes (B21D 11/02 - B21D 11/18 take precedence; using mandrels or the like B21D 9/00)
7/02 . . . over a stationary forming member; by use of a swinging forming member or abutment
7/021 . . . [Construction of forming members having more than one groove]
7/022 . . . over a stationary forming member only
7/0225 . . . [using pulling members]
7/024 . . . by a swinging forming member
7/025 . . . and pulling or pushing the ends of the work
7/028 . . . and altering the profile at the same time, e.g. forming bumpers
7/03 . . . Apparatus with means to keep the profile in shape
7/04 . . . over a movably-arranged forming member (B21D 7/02 takes precedence)
7/06 . . . in press brakes or between rams and anvils or abutments; Pliers with forming dies
7/063 . . . [Pliers with forming dies]
7/066 . . . [combined with oscillating members]
7/08 . . . by passing between rollers or through a curved die
7/085 . . . [by passing through a curved die]
7/10 . . . by abutting members and flexible bending means, e.g. with chains, ropes
7/12 . . . with programme control
7/14 . . . combined with measuring of bends or lengths
7/16 . . . Auxiliary equipment, e.g. for heating or cooling of bends
7/162 . . . [Heating equipment]
7/165 . . . [Cooling equipment]
7/167 . . . [Greasing]
9/00 Bending tubes using mandrels or the like (B21D 11/02 - B21D 11/18 take precedence)
9/001 . . . the mandrel being flexible and engaging the entire tube length
9/003 . . . and built-up from loose elements, e.g. series of balls
9/004 . . . the mandrel being rigid
9/005 . . . co-operating with forming members
9/0055 . . . [Construction of forming members having more than one groove]
9/007 . . . with one or more swinging forming members engaging tube ends only
9/0073 . . . [with one swinging forming member]
9/0076 . . . [with more swinging forming members]
9/008 . . . in press brakes or between rams and anvils or abutments; Pliers with forming dies
9/0085 . . . [Pliers with forming dies]
9/10 . . . by passing between rollers
9/12 . . . by pushing over a curved mandrel; by pushing through a curved die
9/125 . . . [by pushing through a curved die]
9/14 . . . Wrinkle-bending, i.e. bending by corrugating cross-sections of the work (B21D 11/06 takes precedence)
9/15 . . . using filling material of indefinite shape, e.g. sand, plastic material (filling of tubes with such material B21D 11/15)
9/16 . . . Auxiliary equipment, e.g. machines for filling tubes with sand
9/165 . . . [Machines for filling tubes with sand]
9/18 . . . for heating or cooling of bends

11/00 Bending not restricted to forms of material mentioned in only one of groups B21D 5/00, B21D 7/00, B21D 9/00; Bending not provided for in groups B21D 5/00 - B21D 9/00 (corrugating or bending into wave form B21D 13/00, B21D 15/00; flanging B21D 19/00); Twisting
11/02 . . . Bending by stretching or pulling over a die (working sheet metal of limited length by stretching B21D 25/00)
11/06 . . . Bending into helical or spiral form; Forming a succession of return bends, e.g. serpentine form (making helically seamed tubing B21C 37/12)
11/07 . . . Making serpentine-shaped articles by bending essentially in one plane
11/08 . . . Bending by altering the thickness of part of the cross-section of the work (B21D 11/06 takes precedence)
11/085 . . . [by locally stretching or upsetting]
11/10 . . . Bending specially adapted to produce specific articles, e.g. leaf springs [(making or bending leaf springs B21D 53/886)]
11/12 . . . the articles being reinforcements for concrete
11/125 . . . [Bending wire nets]
11/14 . . . Twisting
11/15 . . . Reinforcing rods for concrete
11/16 . . . Crankshafts
11/18 . . . Joggling
11/20 . . . Bending sheet metal, not otherwise provided for
11/203 . . . [Round bending]
11/206 . . . [Curving corrugated sheets]
11/22 . . . Auxiliary equipment, e.g. positioning devices

13/00 Corrugating sheet metal, rods or profiles; Bending sheet metal, rods or profiles into wave form (tubes B21D 15/00)
13/02 . . . by pressing
Straightening; Restoring form; Bending; Corrugating; Flanging

13/04 . by rolling
13/045 . . [the corrugations being parallel to the feeding movement]
13/06 . by drawing
13/08 . by combined methods
13/10 . into a peculiar profiling shape

15/00 Corrugating tubes (wrinkle-bending using mandrels or the like B21D 9/14)
15/02 . longitudinally
15/03 . by applying fluid pressure
15/04 . transversely, e.g. helically
15/06 . annularly { (with thinning B21C 37/205) }
15/10 . by applying fluid pressure
15/105 . . [by applying elastic material]
15/12 . Bending tubes into wave form

17/00 Forming single grooves in sheet metal or tubular or hollow articles
17/02 . by pressing (grooving or notching of bolts, studs, or the like B21K 1/54)
17/025 . . [by pressing tubes axially]
17/04 . by rolling

19/00 Flanging or other edge treatment, e.g. of tubes
19/005 . { Edge deburring or smoothing }
19/02 . by continuously-acting tools moving along the edge
19/04 . . shaped as rollers
19/043 . . . { for flanging edges of plates }
19/046 . . . { for flanging edges of tubular products }
19/06 . working inwardly
19/08 . by single or successive action of pressing tools, e.g. vice jaws
19/082 . . . { for making negative angles }
19/084 . . . . { with linear cams, e.g. aerial cams }
19/086 . . . . { with rotary cams }
19/088 . . . . { for flanging holes }
19/10 . . working inwardly
19/12 . Edge-curling
19/14 . . Reinforcing edges, e.g. armouring same
19/16 . Reverse flanging of tube ends

21/00 Combined processes according to methods covered by groups B21D 1/00 - B21D 19/00

Stamping, Spinning. Deep-drawing: Working sheet metal of limited length by stretching; Punching

22/00 Shaping without cutting, by stamping, spinning, or deep-drawing (otherwise than using rigid devices or tools or yieldable or resilient pads B21D 26/00)
22/02 . Stamping using rigid devices or tools
22/022 . . (by heating the blank or stamping associated with heat treatment (C21D takes precedence))
22/025 . . . { for tubular articles }
22/027 . . . { for flattening the ends of corrugated sheets }
22/04 . . . for dimpling (combined with perforating B21D 28/24)
22/06 . . . having relatively-movable die parts
22/08 . . . with die parts on rotating carriers
22/10 . Stamping using yieldable or resilient pads
22/105 . . . { of tubular products }
22/12 . . . using enclosed flexible chambers
22/125 . . . . { of tubular products }
22/14 . Spinning
22/16 . . over shaping mandrels or formers
22/18 . . using tools guided to produce the required profile
22/185 . . . . { making bombed objects }
22/20 . Deep-drawing (special deep-drawing arrangements in, or in connection with, presses B21D 24/00)
22/201 . . . { Work-pieces: preparation of the work-pieces, e.g. lubricating, coating }
22/203 . . . . { of compound articles }
22/205 . . . { Hydro-mechanical deep-drawing }
22/206 . . . . { articles from a strip in several steps, the articles being coherent with the strip during the operation }
22/208 . . . { by heating the blank or deep-drawing associated with heat treatment (C21D takes precedence) }
22/21 . . . without fixing the border of the blank
22/22 . . with devices for holding the edge of the blanks
22/225 . . . . { with members for radially pushing the blanks }
22/24 . . . involving two drawing operations having effects in opposite directions with respect to the blank
22/26 . . . for making peculiarly, e.g. irregularly, shaped articles
22/28 . . . of cylindrical articles using consecutive dies
22/283 . . . . { with ram and dies aligning means }
22/286 . . . . . { with lubricating or cooling means }
22/30 . . to finish articles formed by deep-drawing

24/00 Special deep-drawing arrangements in, or in connection with, presses
24/005 . . . { Multi-stage presses }
24/02 . Die-cushions
24/04 . Blank holders; Mounting means therefor
24/06 . . Mechanically spring-loaded blank holders
24/08 . . Pneumatically or hydraulically loaded blank holders
24/10 . . Devices controlling or operating blank holders independently, or in conjunction with dies
24/12 . . mechanically
24/14 . . pneumatically or hydraulically
24/16 . . Additional equipment in association with the tools, e.g. for shearing, for trimming

25/00 Working sheet metal of limited length by stretching, e.g. for straightening
25/02 . . by pulling over a die
25/04 . . Clamping arrangements

26/00 Shaping without cutting otherwise than using rigid devices or tools or yieldable or resilient pads, i.e. applying fluid pressure or magnetic forces (stamping using resilient pads B21D 22/10)
26/02 . by applying fluid pressure
26/021 . . Deforming sheet bodies
26/023 . . . including an additional treatment performed by fluid pressure, e.g. perforating
26/025 . . . . Means for controlling the clamping or opening of the moulds
26/027 . . . . Means for controlling fluid parameters, e.g. pressure or temperature
Stamping, Spinning, Deep-drawing; Working sheet metal of limited length by stretching; Punching

26/029 . . . Closing or sealing means
26/031 . . . Mould construction
26/033 . . . Deforming tubular bodies (corrugating tubes by applying fluid pressure B21D 15/03; B21D 15/10)
26/035 . . . including an additional treatment performed by fluid pressure, e.g. perforating
26/037 . . . Forming branched tubes
26/039 . . . Means for controlling the clamping or opening of the moulds
26/041 . . . Means for controlling fluid parameters, e.g. pressure or temperature
26/043 . . . Means for controlling the axial pusher
26/045 . . . Closing or sealing means
26/047 . . . Mould construction
26/049 . . . Deforming bodies having a closed end
26/051 . . . Deforming double-walled bodies
26/053 . . . characterised by the material of the blanks
26/055 . . . Bleaks having super-plastic properties
26/057 . . . Tailored blanks
26/059 . . . Layered blanks
26/06 . . . generated by explosives, e.g. chemical explosives
26/08 . . . generated by evaporation, e.g. of wire, of liquids
26/10 . . . initiated by spark discharge
26/12 . . . applying magnetic forces
26/14 . . . Shaping by press-cutting; Perforating
28/00 . . . [Drive of the tools (B21D 28/007 and B21D 28/20 take precedence)]
28/005 . . . [Adjustment of the punch stroke for compensating wear]
28/007 . . . [Explosive cutting or perforating]
28/02 . . . Punching blanks or articles with or without obtaining scrap (cutting nails or pins from strips or sheet material B21G 3/26); Notching
28/04 . . . Centering the work; Positioning the tools
28/06 . . . Making more than one part out of the same blank; Scrapless working
28/08 . . . Zig-zag sequence working
28/10 . . . Incompletely punching in such a manner that the parts are still coherent with the work
28/12 . . . Punching using rotatable carriers
28/125 . . . [with multi-tools]
28/14 . . . Dies (ejecting or stripping-off devices arranged in punching machines or tools B21D 45/00)
28/145 . . . [with means for slug retention, e.g. a groove]
28/16 . . . Shoulder or burr prevention, [e.g. fine-blanking]
28/18 . . . Yieldable, e.g. rubber, punching pads
28/20 . . . Applications of drives [for reducing noise or wear]
28/22 . . . Notching the peripheries of circular blanks, e.g. laminations for dynamo-electric machines
28/24 . . . Perforating, i.e. punching holes
28/243 . . . [in profiles]
28/246 . . . [Selection of punches]
28/26 . . . in sheets or flat parts

31/00 Other methods for working sheet metal, metal tubes, metal profiles (deforming one surface of tubes helically by rolling B21H 3/00; upsetting B21J 5/08; working metal by removing material therefrom B23; embossing B44B)
31/005 . . . [Incremental shaping or bending, e.g. stepwise moving a shaping tool along the surface of the workpiece (B21D 22/14 takes precedence)]
31/01 . . . Stabbing or piercing, e.g. for making sieves (dimping B21D 22/04; perforating by punching B21D 28/24)
31/04 . . . Expanding other than provided for in groups B21D 1/00 - B21D 28/00, e.g. for making expanded metal (B21D 47/00 takes precedence; enlarging tube ends B21D 41/02)
31/043 . . . [Making use of slitting discs or punch cutters]
31/046 . . . [making use of rotating cutters]
31/06 . . . Deforming sheet metal, tubes or profiles by sequential impacts, e.g. hammering, beating, peen forming (forging hammers B21J 7/00)

33/00 Special measures in connection with working metal foils, e.g. gold foils (cutting or perforating of metal foil analogous to paper B26)
35/00 Combined processes according to [or processes combined with] methods covered by groups B21D 1/00 - B21D 31/00 (B21D 21/00 takes precedence)
35/001 . . . [Shaping combined with punching, e.g. stamping and perforating]
35/002 . . . [Processes combined with methods covered by groups B21D 1/00 - B21D 31/00]
35/003 . . . [Simultaneous forming, e.g. making more than one part per stroke (B21D 26/06 takes precedence)]
35/005 . . . [characterized by the material of the blank or the workpiece (B21D 26/053 takes precedence)]
35/006 . . . [Blanks having varying thickness, e.g. tailoried blanks]
35/007 . . . [Layered blanks (B21D 22/203 takes precedence; joining superposed plates B21D 39/031, B21D 39/034, B21D 39/035)]
35/008 . . . [involving vibration, e.g. ultrasonic]
37/00 Tools as parts of machines covered by this subclass (forms or constructions of tools uniquely adapted for particular operations, see the relevant groups for the operations)
37/01 . . . Selection of materials
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37/02 . . Die constructions enabling assembly of the die parts in different ways (B21D 37/06 takes precedence)
37/04 . . Movable or exchangeable mountings for tools
37/06 . . Pivotally-arranged tools, e.g. disengageable (die sets with dies pivoted to one another B21D 37/12)
37/08 . . Dies with different parts for several steps in a process
37/10 . . Die sets; Pillar guides
37/12 . . Particular guiding equipment, [e.g. pliers]; Special arrangements for interconnection or cooperation of dies
37/14 . . Particular arrangements for handling and holding in place complete dies
37/142 . . (Spotting presses)
37/145 . . (Die storage magazines)
37/147 . . (Tool exchange carts)
37/16 . . Heating or cooling
37/18 . . Lubricating [... lubricating tool and workpiece simultaneously (lubricating workpieces for deep-drawing B21D 22/2011)]
37/20 . . Making tools by operations not covered by a single other subclass
37/205 . . (Making cutting tools)
39/00 Application of procedures in order to alter the diameter of tube ends (B21D 39/00 takes precedence ([: plastic tubes B29C 57/00])
39/02 . . Enlarging
39/021 . . (by means of tube-flaring hand tools)
39/023 . . (comprising rolling elements)
39/025 . . (by means of impact-type swaging hand tools)
39/026 . . (by means of mandrels)
39/028 . . (expandable mandrels)
39/04 . . Reducing; Closing
39/045 . . (Closing)
43/00 Feeding, positioning or storing devices combined with, or arranged in, or specially adapted for use in connection with, apparatus for working or processing sheet metal, metal tubes or metal profiles; Associations therewith of cutting devices (cutting devices associated with the tool, see the relevant group for the tool)
43/003 . . (Positioning devices (B21D 28/04 and B21D 28/265 take precedence; stops B21D 43/26; centering moving strips B21D 43/023))
43/006 . . (Feeding elongated articles, such as tubes, bars, or profiles)
43/02 . . Advancing work in relation to the stroke of the die or tool
43/021 . . (Control or correction devices in association with moving strips)
43/022 . . (Loop-control)
43/023 . . (Centering devices, e.g. edge guiding)
43/025 . . (Fault detection, e.g. misfeed detection)
43/026 . . (Combination of two or more feeding devices provided for in B21D 43/04 - B21D 43/18)
43/027 . . (Combined feeding and ejecting devices)
43/028 . . (Tools travelling with material, e.g. flying punching machines)
43/04 . . by means in mechanical engagement with the work
43/05 . . specially adapted for multi-stage presses (B21D 43/145 takes precedence)
43/052 . . (Devices having a cross bar)
43/055 . . (Devices comprising a pair of longitudinally and laterally movable parallel transfer bars)
43/057 . . (Devices for exchanging transfer bars or grippers; Idle stages, e.g. exchangeable)
43/06 . . by positive or negative engaging parts cooperating with corresponding parts of the sheet or the like to be processed, e.g. carrier bolts or grooved section in the carriers
43/08 . . by rollers (B21D 43/145 takes precedence)
43/09 . . by one or more pairs of rollers for feeding sheet or strip material
43/10 . . by grippers (B21D 43/055; B21D 43/057; B21D 43/145 take precedence)
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B21D

43/05 . . . . [Manipulators, i.e. mechanical arms carrying a gripper element having several degrees of freedom]
43/11 . . . . for feeding sheet or strip material
43/12 . . . . by chains or belts ([(B21D 43/145 takes precedence)]
43/13 . . . . by linearly moving tables
43/14 . . . . by turning devices, e.g. turn-tables
43/145 . . . . {Turnover devices, i.e. by turning about a substantially horizontal axis}
43/16 . . . by gravity, e.g. chutes
43/18 . . . by means in pneumatic or magnetic engagement with the work
43/20 . . . Storage arrangements; Piling or unpiling (in general B65G, [B65H])
43/22 . . . Devices for piling sheets
43/24 . . . Devices for removing sheets from a stack
43/26 . . . Stops
43/28 . . . Associations of cutting devices therewith
43/282 . . . [Discharging crop ends or the like]
43/285 . . . {Devices for handling elongated articles, e.g. bars, tubes or profiles (B21D 43/282, B21D 43/287 take precedence)}
43/287 . . . {Devices for handling sheet or strip material (B21D 43/282 takes precedence)}
45/00 Ejecting or stripping-off devices arranged in machines or tools dealt with in this subclass
45/003 . . . . [in punching machines or punching tools]
45/006 . . . . {Stripping-off devices}
45/02 . . . Ejecting devices
45/04 . . . interrelated with motion of tool
45/06 . . . Stripping-off devices
45/065 . . . . {for deep-drawn cans, e.g. using stripping fingers}
45/08 . . . . interrelated with motion of tool
45/10 . . . Combined ejecting and stripping-off devices

Processing sheet metal or metal tubes, or processing metal profiles according to any of groups B21D 1/00 - B21D 45/00, in the manufacture of finished or semi-finished articles

47/00 Making rigid structural elements or units, e.g. honeycomb structures
47/005 . . . . [Making gratings]
47/01 . . . beams or pillars
47/02 . . . by expanding
47/04 . . . composite sheet metal profiles
49/00 Sheathing or stiffening objects (by winding wire or tape thereon B65H 54/00; B65H 81/00; specially adapted for manufacturing conductors or cables H01B 13/26)
49/005 . . . . {Hollow objects}
51/00 Making hollow objects (from thick-walled or non uniform tubes B21K 21/00)
51/02 . . . characterised by the structure of the objects [(B21D 51/26 takes precedence)]

NOTE
Making hollow objects characterised both by their structure and by their use is classified only in group B21D 51/16

51/04 . . . built-up objects, e.g. objects with rigidly-attached bottom or cover
51/06 . . . folded objects
51/08 . . . ball-shaped objects
51/10 . . . conically or cylindrically shaped objects
51/12 . . . objects with corrugated walls
51/14 . . . Flattening hollow objects for transport or storage; Re-forming same (making tubes from doubled flat material B21C 37/14)
51/16 . . . characterised by the use of the objects (making heat exchangers B21D 53/02)
51/18 . . . vessels, e.g. tubs, vats, tanks, sinks, or the like
51/20 . . . barrels
51/22 . . . pots, e.g. for cooking
51/24 . . . high-pressure containers, e.g. boilers, bottles
51/26 . . . cans or tins; Closing same in a permanent manner (making outlet arrangements B21D 51/38; welding or soldering B23K)
51/2607 . . . {Locally embossing the walls of formed can bodies (B44B 5/00; B44C 1/24; B44C 3/085 take precedence; bulging B21D 51/2646)}
51/2615 . . . . [Edge treatment of cans or tins]
51/2623 . . . . . {Curling}
51/263 . . . . . {Flanging}
51/2638 . . . . . {Necking}
51/2646 . . . . [Of particular non cylindrical shape, e.g. conical, rectangular, polygonal, bulged]
51/2653 . . . . [Methods or machines for closing cans by applying caps or bottoms]
51/2661 . . . . . {Sealing or closing means therefor}
51/2669 . . . . . . [Transforming the shape of formed can bodies; Forming can bodies from flattened tubular blanks; Flattening can bodies]
51/2676 . . . . . . [Cans or tins having longitudinal or helical seams]
51/2684 . . . . . . [Cans or tins having circumferential side seams]
51/2692 . . . . . . [Manipulating, e.g. feeding and positioning devices; Control systems]
51/28 . . . . . Folding the longitudinal seam
51/30 . . . . . Folding the circumferential seam
51/32 . . . . . by rolling
51/34 . . . . . by pressing
51/36 . . . . . collapsible or like thin-walled tubes, e.g. for toothpaste
51/365 . . . . . [involving fixing closure members to the tubes, e.g. nozzles]
51/38 . . . . . Making inlet or outlet arrangements of cans, tins, baths, bottles, or other vessels; Making can ends; Making closures
51/383 . . . . . . [scoring lines, tear strips or pulling tabs]
51/386 . . . . . . . [on the side-wall of containers]
51/40 . . . . . Making outlet openings, e.g. bung holes
51/42 . . . . . . . Making or attaching spouts
51/44 . . . . . . . Making closures, e.g. caps (folded of thin metal foils in the way of making paper caps B31D 5/00; making closures in conjunction with applying same B67B)
51/443 . . . . . . [easily removable closures, e.g. by means of tear strips]
51/446 . . . . . . [Feeding or removal of material]
Processing sheet metal or metal tubes, or processing metal profiles according to any of groups B21D1/00 - B21D45/00, etc.

53/00 Making other particular articles (making wire fabrics B21F; making chains or chain parts B21L)

53/02 . . . heat exchangers {or parts thereof}, e.g. radiators, condensers {fins, headers} (making finned or ribbed tubes by fixing strip material or the like to tubes B21C 37/22)

53/022 . . . [Making the fins]

53/025 . . . {Louvered fins}

53/027 . . . {by helically or spirally winding elongated elements}

53/04 . . . of sheet metal

53/045 . . . {by inflating partially united plates}

53/06 . . . of metal tubes

53/08 . . . of both metal tubes and sheet metal (connecting tubes in openings B21D 39/06)

53/085 . . . {with fins places on zig-zag tubes or parallel tubes}

53/10 . . . parts of bearings; sleeves; valve seats or the like

53/12 . . . cages for bearings

53/14 . . . belts, e.g. machine-gun belts

53/16 . . . rings, e.g. barrel hoops

53/18 . . . of hollow or C-shaped cross-section, e.g. for curtains, for eyelets

53/20 . . . washers, e.g. for sealing

53/22 . . . with means for preventing rotation

53/24 . . . nuts or like thread-engaging members

53/26 . . . wheels or the like

53/261 . . . {pulleys}

53/262 . . . {with inscriptions or the like, e.g. printing wheels]

53/264 . . . {wheels out of a single piece (B21D 53/261 takes precedence)}

53/265 . . . {parts of wheels (B21D 53/28, B21D 53/30 take precedence)}

53/267 . . . {blower wheels, i.e. wheels provided with fan elements}

53/268 . . . {wheels having spokes}

53/28 . . . gear wheels

53/30 . . . wheel rims

53/32 . . . wheel covers

53/34 . . . brake drums

53/36 . . . clips, clamps, or like fastening or attaching devices, e.g. for electric installation

53/38 . . . locksmith's goods, e.g. handles

53/40 . . . hinges, e.g. door hinge plates

53/42 . . . keys {(making keys by combined operations B23P 15/005)}

53/44 . . . fancy goods, e.g. jewellery products

53/46 . . . haberdashery, e.g. buckles, combs; pronged fasteners, e.g. staples

53/48 . . . buttons, e.g. press-buttons, snap fasteners

53/50 . . . metal slide-fastener parts

53/52 . . . fastener elements; Attaching such elements so far as this procedure is combined with the process for making the elements

53/54 . . . slides

53/56 . . . stops

53/58 . . . end-pieces for laces or ropes

53/60 . . . cutlery wares; garden tools or the like

53/62 . . . spoons; table forks

53/64 . . . knives; scissors; cutting blades (B21D 53/72 takes precedence; handle portions B21D 53/70)

53/642 . . . {scissors}

53/645 . . . {safety razor blades}

53/647 . . . {mower blades}

53/66 . . . spades; shovels (handle portions B21D 53/70)

53/68 . . . rakes, garden forks, or the like (handle portions B21D 53/70)

53/70 . . . handle portions (B21D 53/72 takes precedence)

53/72 . . . sickles; scythes

53/74 . . . frames for openings, e.g. for windows, doors, handbags

53/745 . . . {Joining mitered profiles comprising punching the profiles on a corner-angle connecting piece}

53/76 . . . writing or drawing instruments, e.g. writing pens, erasing pens

53/78 . . . propeller blades; turbine blades

53/80 . . . dustproof covers; safety covers

53/82 . . . perforated music sheets; pattern sheets, e.g. for control purposes, stencils

53/84 . . . other parts for engines, e.g. connecting-rods

53/845 . . . {Making camshafts}

53/86 . . . other parts for bicycles or motorcycles

53/88 . . . other parts for vehicles, e.g. cowlings, mudguards

53/883 . . . {reflectors}

53/886 . . . {leaf springs}

53/90 . . . axle-housings

53/92 . . . other parts for aircraft

55/00 Safety devices protecting the machine or the operator, specially adapted for apparatus or machines dealt with in this subclass (for presses in general B30B; safety devices in general F16P)