COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

SHAPING

B21 MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL

B21D 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 1/14 [ ; 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 31/01))

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 . . arranged 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]
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]
Straightening; Restoring form; Bending; Corrugating; Flanging

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)
9/01 . . the mandrel being flexible and engaging the entire tube length
9/03 . . . and built-up from loose elements, e.g. series of balls
9/04 . the mandrel being rigid
9/05 . . co-operating with forming members
9/055 . . . [Construction of forming members having more than one groove]

9/07 . . . with one or more swinging forming members engaging tube ends only
9/073 . . . [with one swinging forming member]
9/076 . . . [with more swinging forming members]
9/08 . in press brakes or between rams and anvils or abutments; Pliers with forming dies
9/085 . . . [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
9/15 . . using filling material of indefinite shape, e.g. sand, plastic material (filling of tubes with such material B21D 9/16)
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
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)
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B21D

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
(connecting by making use of folds B21D 39/00; flaring-out tube ends B21D 41/02)
19/005 . (Edge deburring or smoothing)
19/02 . by continuously-acting tools moving along the edge (edge-curling B21D 19/12)
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 (B21D 22/24 - B21D 22/30 take precedence; shaping over a die without external former B21D 11/02)
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
22/29 . 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
26/029 . Closing or sealing means
26/031 . Mould construction (B21D 26/025 - B21D 26/029 take precedence)
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
Means for controlling the clamping or opening of the moulds
Means for controlling fluid parameters, e.g. pressure or temperature
Means for controlling the axial pusher
Closing or sealing means
Mould construction
(B21D 26/037 - B21D 26/045 take precedence)
Deforming bodies having a closed end
Deforming double-walled bodies
characterised by the material of the blanks
Blanks having super-plastic properties
Tailored blanks
Layered blanks
by shock waves
generated by explosives, e.g. chemical explosives
generated by evaporation, e.g. of wire, of liquids
initiated by spark discharge
applying magnetic forces

Shaping by press-cutting; Perforating

[Drive of the tools (B21D 28/007 and B21D 28/20 take precedence)]
[Adjustment of the punch stroke for compensating wear]
[Explosive cutting or perforating]
Punching blanks or articles with or without obtaining scrap (cutting nails or pins from strips or sheet material B21G 3/26); Notching
Centering the work; Positioning the tools
Making more than one part out of the same blank;
Scraps working
Zig-zag sequence working
Incompletely punching in such a manner that the parts are still coherent with the work
Punching using rotatable carriers
[with multi-tools]
Dies (ejecting or stripping-off devices arranged in punching machines or tools B21D 45/00)
[with means for slug retention, e.g. a groove]
Shoulder or burr prevention, [e.g. fine-blanking]
Yieldable, e.g. rubber, punching pads
Applications of drives {for reducing noise or wear}
Notching the peripheries of circular blanks, e.g. laminations for dynamo-electric machines
Perforating, i.e. punching holes
[in profiles]
[Selection of punches]
[in sheets or flat parts]
[with relative movement of sheet and tools enabling the punching of holes in predetermined locations of the sheet, e.g. holes punching with template]
in tubes or other hollow bodies
[punching outwards]
in annular parts, e.g. rims
in other articles of special shape
[using cam or wedge mechanisms, e.g. aerial cams]
Perforating tools; Die holders
[Draw punches]
[length adjustable perforating tools]
using rotatable work or tool holders

Other methods for working sheet metal, metal tubes, metal profiles (forming one surface of tubes helically by rolling B21H 3/00; upsetting B21J 5/08; working metal by removing material therefrom B23; embossing B44B)
Incremental shaping or bending, e.g. stepwise moving a shaping tool along the surface of the workpiece (B21D 22/14 takes precedence)
Stabbing or piercing, e.g. for making sieves (dimpling B21D 22/04; perforating by punching B21D 28/24)
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)
[Making use of slitting discs or punch cutters]
[making use of rotating cutters]
Deforming sheet metal, tubes or profiles by sequential impacts, e.g. hammering, beating, peen forming (forging hammers B21J 7/00)
Special measures in connection with working metal foils, e.g. gold foils (cutting or perforating of metal foil analogous to paper B26)
Combined processes according to [or processes combined with] methods covered by groups B21D 1/00 - B21D 31/00 (B21D 21/00 takes precedence)
[Shaping combined with punching, e.g. stamping and perforating]
[Processes combined with methods covered by groups B21D 1/00 - B21D 31/00]
[Simultaneous forming, e.g. making more than one part per stroke (B21D 26/06 takes precedence)]
[characterized by the material of the blank or the workpiece (B21D 26/053 takes precedence)]
[Blanks having varying thickness, e.g. tailored blanks]
[Layered blanks (B21D 22/203 takes precedence; joining superposed plates B21D 39/031, B21D 39/034, B21D 39/035)]
[involving vibration, e.g. ultrasonic]
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)
Selection of materials
Die constructions enabling assembly of the die parts in different ways (B21D 37/06 takes precedence)
Movable or exchangeable mountings for tools
Pivotaly-arranged tools, e.g. disengagable (die sets with dies pivoted to one another B21D 27/12)
Dies with different parts for several steps in a process
Die sets; Pillar guides
Particular guiding equipment, [e.g. pliers]; Special arrangements for interconnection or cooperation of dies
Application of procedures in order to connect objects or parts, e.g. coating with sheet metal otherwise than by plating (joining mitred profiles B21D 53/745; riveting B21F uniting components by forging or pressing to form integral members B21K 25/00; welding B23K; press-fitting, force-fitting, or shrinking in general B23P 11/00, B21D 19/00; by adhesives F16B 11/00 [Connections as such F16L, F16B])); Tube expanders

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 ejection devices]

43/028 . . . [Tools travelling with material, e.g. flying punching machines]

43/04 . . . by means in mechanical engagement with the workpiece, e.g. expandable mandrels

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)]

43/105 . . . . [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]
the manufacture of finished or semi-finished articles
profiles according to any of groups B21D 1/00 - B21D 45/00, in
the manufacture of finished or semi-finished articles

Making rigid structural elements or units, e.g. 
honeycomb structures
47/00
47/005 . . . (Making gratings)
47/01 . . . beams or pillars
47/02 . . . by expanding
47/04 . . . composite sheet metal profiles

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)
49/00
49/005 . . . (Hollow objects)

Making hollow objects (from thick-walled or non
uniform tubes B21K 21/00)
51/00
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)
Processing sheet metal or metal tubes, or processing metal profiles according to any of groups B21D1/00 - B21D45/00,...

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 } B21C 37/22

53/04 . . of sheet metal

53/045 . . { by inflating partially united plates } B21C 37/22

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 B21D 53/70

53/68 . . . rakes, garden forks, or the like 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 mitred 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 B30R; safety devices in general F16P