

**CPC****COOPERATIVE PATENT CLASSIFICATION****B21C****MANUFACTURE OF METAL SHEETS, WIRE, RODS, TUBES OR PROFILES, OTHERWISE THAN BY ROLLING; AUXILIARY OPERATIONS USED IN CONNECTION WITH METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL**

**Metal-drawing** ([continuous casting B22D 11/00](#); [pressure welding by means of a rolling mill B23K 20/04](#))

- B21C 1/00**      **Manufacture of metal sheets, metal wire, metal rods, metal tubes by drawing**
- B21C 1/003**      . {Drawing materials of special alloys so far as the composition of the alloy requires or permits special drawing methods or sequences}
- B21C 1/006**      . {using vibratory energy}
- B21C 1/02**      . Drawing metal wire or like flexible metallic material by drawing machines or apparatus in which the drawing action is effected by drums
- B21C 1/04**      . . with two or more dies operating in series
- B21C 1/06**      . . . in which the material slips on the drums
- B21C 1/08**      . . . in which the material does not slip on the drums
- B21C 1/10**      . . . . with accumulation of material between consecutively-arranged dies
- B21C 1/12**      . . Regulating or controlling speed of drawing drums, e.g. to influence tension; Drives; Stop or relief mechanisms ([couplings for drums B21C 1/14](#); [design or construction of electrical equipment, see the relevant classes](#))
- B21C 1/14**      . . Drums, e.g. capstans ([capstans or winches in general B66D](#)); Connection of grippers thereto; Grippers specially adapted for drawing machines or apparatus of the drum type; Couplings specially adapted for these drums
- B21C 1/16**      . Metal drawing by machines or apparatus in which the drawing action is effected by other means than drums, e.g. by a longitudinally-moved carriage pulling or pushing the work or stock for making metal sheets, bars, or tubes
- B21C 1/18**      . . from stock of limited length ([B21C 1/22 takes precedence](#))
- B21C 1/20**      . . from stock of essentially unlimited length ([B21C 1/22 takes precedence](#))
- B21C 1/22**      . . specially adapted for making tubular articles ([bending sheet metal into tubular form by drawing B21D 5/10](#))
- B21C 1/24**      . . . by means of mandrels ([mandrels B21C 3/16](#))
- B21C 1/26**      . . . . Push-bench drawing
- B21C 1/27**      . . Carriages; Drives
- B21C 1/28**      . . . Carriages; Connections of grippers thereto; Grippers ([for drawing machines of the drum type B21C 1/14](#))
- B21C 1/30**      . . . Drives, e.g. carriage-traversing mechanisms; Driving elements, e.g. drawing chains; Controlling the drive ({[endlessly revolving chain systems for metal coiling: B21C 47/3458](#)})
- B21C 1/305**      . . . . {Linear motor pulling devices}
- B21C 1/32**      . . Feeding or discharging the material or mandrels
- B21C 1/34**      . . Guiding or supporting the material or mandrels

<b>B21C 3/00</b>	<b>Profiling tools for metal drawing; Combinations of dies and mandrels</b>
B21C 3/02	<ul style="list-style-type: none"> <li>• Dies; Selection of material therefor; Cleaning thereof</li> </ul>
B21C 3/025	<ul style="list-style-type: none"> <li>• . {comprising diamond parts}</li> </ul>
B21C 3/04	<ul style="list-style-type: none"> <li>• . with non-adjustable section (<a href="#">B21C 3/08 takes precedence</a>)</li> </ul>
B21C 3/06	<ul style="list-style-type: none"> <li>• . with adjustable section (<a href="#">B21C 3/08 takes precedence</a>)</li> </ul>
B21C 3/08	<ul style="list-style-type: none"> <li>• . with section defined by rollers, balls, or the like</li> </ul>
B21C 3/10	<ul style="list-style-type: none"> <li>• . with hydraulic forces acting immediately on work</li> </ul>
B21C 3/12	<ul style="list-style-type: none"> <li>• . Die holders; Rotating dies</li> </ul>
B21C 3/14	<ul style="list-style-type: none"> <li>• . . Die holders combined with devices for guiding the drawing material or combined with devices for cooling heating, or lubricating</li> </ul>
B21C 3/16	<ul style="list-style-type: none"> <li>• Mandrels (<a href="#">separating mandrels from work B21C 45/00</a>); Mounting or adjusting same</li> </ul>
B21C 3/18	<ul style="list-style-type: none"> <li>• Making tools by operation not covered by a single other subclass; repairing</li> </ul>
<b>B21C 5/00</b>	<b>Pointing; Push-pointing</b>
B21C 5/003	<ul style="list-style-type: none"> <li>• {of hollow material, e.g. tube}</li> </ul>
B21C 5/006	<ul style="list-style-type: none"> <li>• {of solid material, e.g. wire or profiles}</li> </ul>
<b>B21C 9/00</b>	<b>Cooling, heating or lubricating drawing material (<a href="#">B21C 3/14 takes precedence</a>)</b>
B21C 9/005	<ul style="list-style-type: none"> <li>• {Cold application of the lubricant (<a href="#">when combined with heating steps B21C 9/00</a>)}</li> </ul>
B21C 9/02	<ul style="list-style-type: none"> <li>• Selection of compositions therefor</li> </ul>
<b>B21C 19/00</b>	<b>Devices for straightening wire or like work combined with or specially adapted for use in connection with drawing or winding machines or apparatus</b>

### **Metal extruding** ([continuous casting B22D 11/00](#))

<b>B21C 23/00</b>	<b>Extruding metal; Impact extrusion</b>
B21C 23/001	<ul style="list-style-type: none"> <li>• {to improve the material properties, e.g. lateral extrusion}</li> </ul>
B21C 23/002	<ul style="list-style-type: none"> <li>• {Extruding materials of special alloys so far as the composition of the alloy requires or permits special extruding methods of sequences}</li> </ul>
B21C 23/004	<ul style="list-style-type: none"> <li>• {using vibratory energy}</li> </ul>
B21C 23/005	<ul style="list-style-type: none"> <li>• {Continuous extrusion starting from solid state material (<a href="#">B21C 23/008 takes precedence</a>)}</li> </ul>
B21C 23/007	<ul style="list-style-type: none"> <li>• {Hydrostatic extrusion}</li> </ul>
B21C 23/008	<ul style="list-style-type: none"> <li>• . {Continuous extrusion}</li> </ul>
B21C 23/01	<ul style="list-style-type: none"> <li>• starting from material of particular form or shape, e.g. mechanically pre-treated (<a href="#">B21C 23/22 takes precedence</a>; heat treatment or combinations thereof with mechanical treatments, see appropriate classes)</li> </ul>
B21C 23/02	<ul style="list-style-type: none"> <li>• Making uncoated products</li> </ul>
B21C 23/03	<ul style="list-style-type: none"> <li>• . by both direct and backward extrusion</li> </ul>

- B21C 23/035 . . . {Making products of generally elongated shape}
- B21C 23/04 . . by direct extrusion
- B21C 23/06 . . . Making sheets
- B21C 23/08 . . . Making wire, bars, tubes
- B21C 23/085 . . . . {Making tubes (B21C 23/10 take precedence)}
- B21C 23/10 . . . . Making finned tubes
- B21C 23/12 . . . . Extruding bent tubes or rods
- B21C 23/14 . . . Making other products
- B21C 23/142 . . . . {Making profiles}
- B21C 23/145 . . . . . {Interlocking profiles}
- B21C 23/147 . . . . {Making drill blanks (making twist-drills B23P 15/32)}
- B21C 23/16 . . . . Making turbo blades or propellers
- B21C 23/18 . . by impact extrusion
- B21C 23/183 . . . {by forward extrusion}
- B21C 23/186 . . . {by backward extrusion}
- B21C 23/20 . . by backward extrusion
- B21C 23/205 . . . {Making products of generally elongated shape}
- B21C 23/21 . Presses specially adapted for extruding metal (extrusion presses in general B30B 11/22)
- B21C 23/211 . . {Press driving devices}
- B21C 23/212 . . {Details (B21C 23/217, B21C 23/218 take precedence)}
- B21C 23/214 . . . {Devices for changing die or container}
- B21C 23/215 . . . {Devices for positioning or centering press components, e.g. die or container}
- B21C 23/217 . . {Tube extrusion presses (B21C 23/218 takes precedence)}
- B21C 23/218 . . {Indirect extrusion presses}
- B21C 23/22 . Making metal-coated products; Making products from two or more metals
- B21C 23/24 . . Covering indefinite lengths of metal or non-metal material with a metal coating
- B21C 23/26 . . . Applying metal coats to cables, e.g. to insulated electric cables
- B21C 23/28 . . . . on intermittently-operating extrusion presses
- B21C 23/30 . . . . on continuously-operating extrusion presses
- B21C 23/32 . Lubrication of metal being extruded or of dies, or the like, e.g. physical state of lubricant, location where lubricant is applied (chemical composition, see appropriate classes)
- B21C 25/00** **Profiling tools for metal extruding**
- B21C 25/02 . Dies
- B21C 25/025 . . {Selection of materials therefor}
- B21C 25/04 . Mandrels
- B21C 25/06 . Press heads, dies, or mandrels for coating work

- B21C 25/08
  - Dies or mandrels with section variable during extruding, e.g. for making tapered work; Controlling variation
- B21C 25/10
  - Making tools by operations not covered by a single other subclass
- B21C 26/00**      **Rams or plungers; Discs therefor**
- B21C 27/00**      **Containers for metal to be extruded ([B21C 29/02](#) takes precedence)**
- B21C 27/02
  - for making coated work
- B21C 27/04
  - Venting metal-container chamber
- B21C 29/00**      **Cooling or heating work or parts of the extrusion press; {Gas treatment of work}**
- B21C 29/003
  - {Cooling or heating of work}
- B21C 29/006
  - {Gas treatment of work, e.g. to prevent oxidation or to create surface effects}
- B21C 29/02
  - {Cooling or heating} of containers for metal to be extruded
- B21C 29/04
  - {Cooling or heating} of press heads, dies or mandrels
- B21C 31/00**      **Control devices, e.g. for regulating the pressing speed or temperature of metal ([B21C 25/08](#) takes precedence); Measuring devices, e.g. for temperature of metal, combined with or specially adapted for use in connection with extrusion presses (measuring devices of more general interest within subclass [B21C](#), see group [B21C 51/00](#))**
- B21C 33/00**      **Feeding extrusion presses with metal to be extruded; {Loading the dummy block}**
- B21C 33/002
  - {Encapsulated billet (manufacturing wires or fine wires [B21C 37/045](#), [B21C 37/047](#))}
- B21C 33/004
  - {Composite billet}
- B21C 33/006
  - {Consecutive billets, e.g. billet profiles allowing air expulsion or bonding of billets}
- B21C 33/008
  - {Scalping billets, e.g. for removing oxide layers prior or during extrusion}
- B21C 33/02
  - the metal being in liquid form
- B21C 35/00**      **Removing work or waste from extruding presses; Drawing-off extruded work (in connection with the extruding of bent tubes or rods [B21C 23/12](#)); Cleaning dies, ducts, containers, or mandrels**
- B21C 35/02
  - Removing or drawing-off work {(linear motor pulling devices [B21C 1/305](#))}
- B21C 35/023
  - • {Work treatment directly following extrusion, e.g. further deformation or surface treatment ([B21C 35/03](#) takes precedence; gas treatment [B21C 29/006](#))}
- B21C 35/026
  - • • {Removing sections from the extruded work, e.g. removing a strip to create an open profile}
- B21C 35/03
  - • Straightening the work (metal straightening in general [B21D](#))
- B21C 35/04
  - Cutting-off or removing waste
- B21C 35/06
  - Cleaning dies, ducts, containers or mandrels

<b>B21C 37/00</b>	<b>Manufacture of metal sheets, bars, wire, tubes or like semi-manufactured products, not otherwise provided for</b> (by rolling <a href="#">B21B</a> ; by working or processing semi-finished sheet metal, profiles, tubes, or wire <a href="#">B21D</a> or <a href="#">B21F</a> ; by casting <a href="#">B22</a> ; by material-removing machine tools <a href="#">B23</a> ; by welding, e.g. cladding or plating <a href="#">B23K</a> ; by grinding or polishing <a href="#">B24</a> ; by electroforming <a href="#">C25D 1/00</a> ; by drawing or extruding, see the relevant groups); <b>Manufacture of tubes of special shape</b>
<a href="#">B21C 37/02</a>	<ul style="list-style-type: none"> <li>of sheets</li> </ul>
<a href="#">B21C 37/04</a>	<ul style="list-style-type: none"> <li>of bars or wire {(wire-like electrical connectors in or for semiconductor devices <a href="#">H01L 24/42</a>)}</li> </ul>
<a href="#">B21C 37/042</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Manufacture of coated wire or bars}</li> </ul> </li> </ul>
<a href="#">B21C 37/045</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Manufacture of wire or bars with particular section or properties}</li> </ul> </li> </ul>
<a href="#">B21C 37/047</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{of fine wires}</li> </ul> </li> </ul>
<a href="#">B21C 37/06</a>	<ul style="list-style-type: none"> <li>of tubes or metal hoses; Combined procedures for making tubes, e.g. for making multi-wall tubes (bending sheets for making tubes <a href="#">B21D 5/00</a>; seaming by folding <a href="#">B21D 39/02</a>)</li> </ul>
<a href="#">B21C 37/065</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{starting from a specific blank, e.g. tailored blank}</li> </ul> </li> </ul>
<a href="#">B21C 37/08</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Making tubes with welded or soldered seams (involving only a soldering or welding operation <a href="#">B23K</a> {with helically arranged seams <a href="#">B21C 37/122</a>})</li> </ul> </li> </ul>
<a href="#">B21C 37/0803</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{the tubes having a special shape, e.g. polygonal tubes}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0807</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Tube treating or manipulating combined with, or specially adapted for use in connection with tube making machines, e.g. drawing-off devices, cutting-off}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0811</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{removing or treating the weld bead}</li> </ul> </li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0815</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{without continuous longitudinal movement of the sheet during the bending operation (sheet bending in general <a href="#">B21D</a>)}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0818</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Manufacture of tubes by drawing of strip material through dies}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0822</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Guiding or aligning the edges of the bent sheet}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/0826</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Preparing the edges of the metal sheet with the aim of having some effect on the weld}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/083</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Supply, or operations combined with supply, of strip material</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/087</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using rods or strips of soldering material</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/09</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>of coated strip material; {Making multi-wall tubes}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/10</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Making tubes with riveted seams {or with non-welded and non-soldered seams}</li> </ul> </li> </ul>
<a href="#">B21C 37/101</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Making of the seams}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/102</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{of coated strip material (making multi-wall tubes)}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/104</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{the tubes having a special shape, e.g. polygonal tubes}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/105</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Supply, or operations combined with supply, of strip material}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/107</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{Tube treating or manipulating combined with or specially adapted for use in connection with tube-making machines e.g. drawing-off devices, cutting-off}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/108</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{without continuous longitudinal movement of the sheet during the bending operation (sheet bending in general <a href="#">B21D</a>)}</li> </ul> </li> </ul> </li> </ul>
<a href="#">B21C 37/12</a>	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Making tubes or metal hoses with helically arranged seams</li> </ul> </li> </ul>

B21C 37/121	. . . {with non-welded and non-soldered seams}
B21C 37/122	. . . {with welded or soldered seams (welding and soldering helically arranged seams, per se <a href="#">B23K</a> )}
B21C 37/123	. . . {of coated strip material; Making multi-wall tubes}
B21C 37/124	. . . {the tubes having a special shape, e.g. with corrugated wall, flexible tubes}
B21C 37/125	. . . . {curved section, e.g. elbow}
B21C 37/126	. . . {Supply, or operations combined with supply, of strip material}
B21C 37/127	. . . {Tube treating or manipulating combined with or specially adapted for use in connection with tube making machines, e.g. drawing-off devices, cutting-off}
B21C 37/128	. . . {Control or regulating devices}
B21C 37/14	. . Making tubes from double flat material
B21C 37/15	. . Making tubes of special shape; Making tube fittings {( <a href="#">B21C 37/0803</a> , <a href="#">B21C 37/104</a> , <a href="#">B21C 37/124</a> , take precedence)}
B21C 37/151	. . . {Making tubes with multiple passages}
B21C 37/152	. . . {Making rifle and gunbarrels}
B21C 37/153	. . . . {Making tubes with inner- and/or outer guides}
B21C 37/154	. . . {Making multi-wall tubes}
B21C 37/155	. . . {Making} tubes with non circular section ( <a href="#">B21C 37/151</a> , <a href="#">B21C 37/154</a> take precedence)
B21C 37/156	. . . {Making tubes with wall irregularities ( <a href="#">B21C 37/20</a> , <a href="#">B21C 37/22</a> take precedence)}
B21C 37/157	. . . . {Perforations}
B21C 37/158	. . . . {Protrusions, e.g. dimples}
B21C 37/16	. . . Making tubes with varying diameter in longitudinal direction
B21C 37/18	. . . . conical tubes
B21C 37/185	. . . . . {starting from sheet material}
B21C 37/20	. . . Making helical or similar guides in or on tubes without removing material, e.g. by drawing same over mandrels, by pushing same through dies; {Making tubes with angled walls, ribbed tubes and tubes with decorated walls}
B21C 37/202	. . . . {with guides parallel to the tube axis}
B21C 37/205	. . . . {with annular guides}
B21C 37/207	. . . . {with helical guides}
B21C 37/22	. . . Making finned or ribbed tubes by fixing strip or like material to tubes ( <a href="#">making heat exchangers B21D 53/02</a> )
B21C 37/225	. . . . {longitudinally-ribbed tubes}
B21C 37/24	. . . . annularly-ribbed tubes
B21C 37/26	. . . . helically-ribbed tubes
B21C 37/28	. . . Making tube fittings for connecting pipes, e.g. U-pieces
B21C 37/283	. . . . {Making U-pieces ( <a href="#">B21C 37/286</a> takes precedence)}
B21C 37/286	. . . . {starting from sheet material}

- B21C 37/29 . . . . Making branched pieces, e.g. T-pieces
- B21C 37/292 . . . . {Forming collars by drawing or pushing a rigid forming tool through an opening in the tube wall}
- B21C 37/294 . . . . {Forming collars by compressing a fluid or a yieldable or resilient mass in the tube}
- B21C 37/296 . . . . {Making branched pieces starting from strip material; Making branched tubes by securing a secondary tube in an opening in the undeformed wall of a principal tube}
- B21C 37/298 . . . . {Forming collars by flow-drilling ([flow drilling B21J 5/066](#))}
- B21C 37/30 . . Finishing tubes, e.g. sizing, burnishing
- B21C 43/00** **Devices for cleaning metal products combined with or specially adapted for use with machines or apparatus provided for in this subclass**
- B21C 43/02 . combined with or specially adapted for use in connection with drawing or winding machines or apparatus
- B21C 43/04 . . Devices for de-scaling wire or like flexible work

**Auxiliary operation used in connection with metal working without essentially removing material**

- B21C 45/00** **Separating mandrels from work or vice-versa**
- B21C 47/00** **Winding-up, coiling or winding-off metal wire, metal band or other flexible metal material characterised by features relevant to metal processing only ([coiling wire into particular form B21F 3/00](#); [hot coilers in connection with heat-treatment apparatus C21D 9/68](#))**
- B21C 47/003 . {Regulation of tension or speed; Braking}
- B21C 47/006 . {winding-up or winding-off several parallel metal bands}
- B21C 47/02 . Winding-up or coiling
- B21C 47/04 . . on or in reels or drums, without using a moving guide ([reels or drums B21C 47/28](#))
- B21C 47/045 . . . {in rotating drums}
- B21C 47/06 . . . with loaded rollers, bolts, or equivalent means holding the material on the reel or drum
- B21C 47/063 . . . . {with pressure rollers only}
- B21C 47/066 . . . . {with belt wrappers only}
- B21C 47/08 . . without making use of a reel or drum, the first turn being formed by a stationary guide
- B21C 47/10 . . by means of a moving guide
- B21C 47/12 . . . the guide moving parallel to the axis of the coil ([B21C 47/14 takes precedence](#))
- B21C 47/14 . . . by means of a rotating guide, e.g. laying the material around a stationary reel or drum
- B21C 47/143 . . . . {the guide being a tube}
- B21C 47/146 . . . . {Controlling or influencing the laying pattern of the coils}
- B21C 47/16 . Unwinding or uncoiling



- B21C 47/18
  - . . from reels or drums
- B21C 47/20
  - . . . the unreeled material moving transversely to the tangent line of the drum, e.g. axially, radially
- B21C 47/22
  - . . Unwinding coils without reels or drums
- B21C 47/24
  - . Transferring coils to or from winding apparatus or to or from operative position therein; Preventing uncoiling during transfer
- B21C 47/242
  - . . {Devices for swinging the coil from horizontal to vertical, or vice versa}
- B21C 47/245
  - . . {Devices for the replacement of full reels by empty reels or vice versa, without considerable loss of time}
- B21C 47/247
  - . . {Joining wire or band ends}
- B21C 47/26
  - . Special arrangements with regard to simultaneous or subsequent treatment of the material
- B21C 47/262
  - . . {Treatment of a wire, while in the form of overlapping non-concentric rings}
- B21C 47/265
  - . . {"helicofil" systems}
- B21C 47/267
  - . . {Scrap treatment}
- B21C 47/28
  - . Drums or other coil-holders ([gripping means B21C 47/32](#))
- B21C 47/30
  - . . expansible or contractible
- B21C 47/32
  - . Tongs or gripping means specially adapted for reeling operations
- B21C 47/323
  - . . {Slits or pincers on the cylindrical wall of a reel or bobbin, adapted to grip the end of the material being wound}
- B21C 47/326
  - . . {Devices for pressing the end of the material being wound against the cylindrical wall of the reel or bobbin}
- B21C 47/34
  - . Feeding or guiding devices not specially adapted to a particular type of apparatus
- B21C 47/3408
  - . . {for monitoring the lateral position of the material}
- B21C 47/3416
  - . . . {with lateral edge contact}
- B21C 47/3425
  - . . . {without lateral edge contact}
- B21C 47/3433
  - . . {for guiding the leading end of the material, e.g. from or to a coiler}
- B21C 47/3441
  - . . . {Diverting the leading end, e.g. from main flow to a coiling device}
- B21C 47/345
  - . . {for monitoring the tension or advance of the material}
- B21C 47/3458
  - . . . {Endlessly revolving chain systems ([metal drawing B21C 1/30](#))}
- B21C 47/3466
  - . . {by using specific means}
- B21C 47/3475
  - . . . {Fluid pressure or vacuum}
- B21C 47/3483
  - . . . {Magnetic field}
- B21C 47/3491
  - . . . {Brushes}

**B21C 49/00**      **Devices for temporarily accumulating material**

**B21C 51/00**      **Measuring, gauging, indicating, counting, or marking devices specially adapted for use in the production or manipulation of material in accordance with subclasses [B21B](#) - [B21F](#)**

- B21C 51/005
  - . {Marking devices}

**B21C 99/00**      **Subject matter not provided for in other groups of this subclass**