

**CPC****COOPERATIVE PATENT CLASSIFICATION****B21F**

**WORKING OR PROCESSING OF METAL WIRE** ({reducing diameter by} rolling of metal [B21B](#); by drawing, auxiliary operations used in connection with metal-working without essentially removing material [B21C](#); bundling articles [B65B 13/00](#))

**Wire working characterised by operations performed****B21F 1/00****Bending wire other than coiling; Straightening wire**

- B21F 1/002 . {by means of manually operated devices, e.g. pliers}
- B21F 1/004 . {by means of press-type tooling}
- B21F 1/006 . {in 3D with means to rotate the tools about the wire axis}
- B21F 1/008 . {in 3D with means to rotate the wire about its axis}
- B21F 1/02 . Straightening
- B21F 1/023 . . {in a device rotating about the wire axis}
- B21F 1/026 . . {Straightening and cutting}
- B21F 1/04 . Undulating
- B21F 1/06 . Bending wire-eyes

**B21F 3/00****Coiling wire into particular forms**

- B21F 3/02 . helically
- B21F 3/027 . . with extended ends formed in a special shape, e.g. for clothes-pegs
- B21F 3/04 . . externally on a mandrel or the like
- B21F 3/06 . . internally on a hollow form
- B21F 3/08 . to flat spiral
- B21F 3/10 . to spirals other than flat, e.g. conical
- B21F 3/12 . of interconnected helical springs

**B21F 5/00****Upsetting wire {or pressing operations affecting the wire cross-section} (in the manufacture of nails or pins [B21G 3/12](#))**

- B21F 5/005 . {Upsetting wire}

**B21F 7/00****Twisting wire; Twisting wire together (for connections of limited size [B21F 15/04](#))****B21F 9/00****Straining wire (straining pre-stressing wires for concrete [E04G 21/12](#); connections or attachments adapted for straining [F16G 11/00](#); {bundling machines or tools [B65B 13/00](#)})**

- B21F 9/002 . {to maintain tension in the wire, e.g. to pull the wire taut}
- B21F 9/005 . {to affect the material properties of the wire}
- B21F 9/007 . {to induce a plastic deformation of the wire}
- B21F 9/02 . by tools adapted also for making connections

- B21F 11/00**      **Cutting wire** (hand cutting tools [B26B](#))
- B21F 11/005      . {springs}
- B21F 13/00**      **Splitting wire**
- B21F 15/00**      **Connecting wire to wire or other metallic material or objects; Connecting parts by means of wire** (tools for both straining and connecting [B21F 9/00](#); jacketing or reinforcing [B21F 17/00](#); manufacture of wire network [B21F 27/00](#); in making bands [B21F 43/00](#) {bundling machines or tools [B65B 13/00](#); for semiconductors [H01L 24/85](#)})
- B21F 15/02      . wire with wire
- B21F 15/04      . . without additional connecting elements or material, e.g. by twisting
- B21F 15/06      . . with additional connecting elements or material {(B21F 27/08 takes precedence)}
- B21F 15/08      . . . making use of soldering or welding {(B21F 27/10 takes precedence)}
- B21F 15/10      . wire with sheet metal
- B21F 17/00**      **Jacketing or reinforcing articles with wire** (by winding [B65H 54/00](#), [B65H 81/00](#); by braiding [D04C](#))
- B21F 19/00**      **Metallic coating of wire** (by extruding [B21C 23/24](#); by soldering or welding, e.g. cladding or plating [B23K](#); by other non-mechanical means [C23](#); electroplating [C25D](#))
- B21F 23/00**      **Feeding wire in wire-working machines or apparatus** (applicable also to feeding rods or strips [B21D 43/00](#))
- B21F 23/002      . {Feeding means specially adapted for handling various diameters of wire or rod}
- B21F 23/005      . {Feeding discrete lengths of wire or rod}
- B21F 23/007      . . {using pick-up means, e.g. for isolating a predefined number of wires from a bundle}

**Wire working characterised by the particular articles produced**

- B21F 25/00**      **Making barbed wire**
- B21F 27/00**      **Making wire network, i.e. wire nets** (meshed-ring network [B21F 31/00](#); in making bands [B21F 43/00](#); using looms [D03D](#))
- B21F 27/005      . {Wire network per se}
- B21F 27/02      . without additional connecting elements or material at crossings, e.g. connected by knitting
- B21F 27/04      . . Manufacturing on machines with rotating blades or formers
- B21F 27/06      . . Manufacturing on twister-gear machines
- B21F 27/08      . with additional connecting elements or material at crossings
- B21F 27/10      . . with soldered or welded crossings {(resistance spot welding machines for manufacturing of metallic grids or mats [B23K 11/008](#))}
- B21F 27/12      . Making special types or portions of network by methods or means specially adapted therefor

B21F 27/121	.. {of tubular form, e.g. as reinforcements for pipes or pillars}
B21F 27/122	... {by attaching a continuous stirrup to longitudinal wires}
B21F 27/124	.... {applied by rotation}
B21F 27/125	... {by attaching individual stirrups to longitudinal wires}
B21F 27/127	... {by bending preformed mesh}
B21F 27/128	.. {of three-dimensional form by connecting wire networks, e.g. by projecting wires through an insulating layer}
B21F 27/14	.. Specially bending or deforming free wire ends
B21F 27/16	.. for spring mattresses
B21F 27/18	.. of meshed work for filters or sieves
B21F 27/20	.. of plaster-carrying network
B21F 27/22	.. of network for wire-reinforced glass or the like
<b>B21F 29/00</b>	<b>Making fencing or like material made partly of wire</b> ( <a href="#">B21F 25/00</a> , <a href="#">B21F 27/00</a> take precedence)
B21F 29/02	. comprising bars or the like connected by wires
<b>B21F 31/00</b>	<b>Making meshed-ring network from wire</b>
<b>B21F 33/00</b>	<b>Tools or devices specially designed for handling or processing wire fabrics or the like</b>
B21F 33/002	. {Coiling or packing wire network}
B21F 33/005	. {Cutting wire network}
B21F 33/007	. {Connecting wire network}
B21F 33/02	. Mounting of wire network on frames
B21F 33/025	.. {Mounting of mattress innersprings on borderframes}
B21F 33/04	. Connecting ends of helical springs for mattresses
<b>B21F 35/00</b>	<b>Making springs from wire</b> (by coiling wire <a href="#">B21F 3/00</a> ; making resilient rings <a href="#">B21F 37/02</a> )
B21F 35/003	. {Multi-filament springs, e.g. made of stranded, braided, cable or multi-filament material}
B21F 35/006	. {Double twist coil springs}
B21F 35/02	. Bending or deforming ends of coil springs to special shape
B21F 35/04	. Making flat springs, e.g. sinus springs
<b>B21F 37/00</b>	<b>Manufacture of rings from wire</b> (in chain making <a href="#">B21L</a> ; making of tyre beads <a href="#">B29D 30/48</a> )
B21F 37/02	. of resilient rings, e.g. key-rings
B21F 37/04	. of washers ( <a href="#">B21F 37/02</a> takes precedence)
<b>B21F 39/00</b>	<b>Making wheel spokes from wire</b>
<b>B21F 41/00</b>	<b>Making umbrella frames or members from wire</b>

<b>B21F 43/00</b>	<b>Making bands, e.g. bracelets, or wire</b> (making chains <a href="#">B21L</a> ; using looms <a href="#">D03D</a> )
<b>B21F 45/00</b>	<b>Wire-working in the manufacture of other particular articles</b> (of pins, needles, nails, hairpins <a href="#">B21G</a> ; of chains <a href="#">B21L</a> ; {for semiconductor devices <a href="#">H01L 24/42</a> })
<a href="#">B21F 45/002</a>	. {of frames for spectacles}
<a href="#">B21F 45/004</a>	. {Mounting bails on containers}
<a href="#">B21F 45/006</a>	. {of concrete reinforcement fibres}
<a href="#">B21F 45/008</a>	. {of medical instruments, e.g. stents, corneal rings (medical science <a href="#">A61</a> )}
<a href="#">B21F 45/02</a>	. of clothes hangers
<a href="#">B21F 45/04</a>	. of elements, e.g. levers or links, for bottle stoppers
<a href="#">B21F 45/06</a>	. of flexible shafts or hollow conduits, e.g. for Bowden mechanisms
<a href="#">B21F 45/08</a>	. of loom heddles
<a href="#">B21F 45/10</a>	. of cards for fabric-napping machines
<a href="#">B21F 45/12</a>	. of fishing hooks
<a href="#">B21F 45/14</a>	. of end-pieces for laces or ropes
<a href="#">B21F 45/16</a>	. of devices for fastening or securing purposes
<a href="#">B21F 45/18</a>	. . of slide fastener elements
<a href="#">B21F 45/20</a>	. . of springs hooks; of spring safety hooks
<a href="#">B21F 45/22</a>	. . of paper fasteners or clips (staples <a href="#">B21F 45/24</a> )
<a href="#">B21F 45/24</a>	. . of staples; of belt-fastening elements
<a href="#">B21F 45/26</a>	. . of buttons
<a href="#">B21F 45/28</a>	. . . of "patent-fastener" or press-button type
<b>B21F 99/00</b>	<b>Subject matter not provided for in other groups of this subclass</b>