

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

**WORKING AND PROCESSING OF WIRE** ({ reducing diameter by} rolling of metal [B21B](#); by drawing, auxiliary operations used in connection with metal working without essentially removing material [B21C](#))

**Guidance heading:** 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}

|                   |   |
|-------------------|---|
| <b>B21F 7/00</b>  | <b>Twisting wire; Twisting wire together</b> (for connections of limited size <a href="#">B21F 15/04</a> )  |
| <b>B21F 9/00</b>  | <b>Straining wire</b> (straining pre-stressing wires for concrete <a href="#">E04G 21/12</a> ; connections or attachments adapted for straining <a href="#">F16G 11/00</a> ; {bundling machines or tools <a href="#">B65B 13/00</a> })  |
| 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  |
| <b>B21F 11/00</b> | <b>Cutting wire</b> (hand cutting tools <a href="#">B26B</a> )  |
| B21F 11/005       | . {springs}   |
| <b>B21F 13/00</b> | <b>Splitting wire</b>   |
| <b>B21F 15/00</b> | <b>Connecting wire to wire or other metallic material or objects; Connecting parts by means of wire</b> (tools for both straining and connecting <a href="#">B21F 9/00</a> ; jacketing or reinforcing <a href="#">B21F 17/00</a> ; manufacture of wire network <a href="#">B21F 27/00</a> ; in making bands <a href="#">B21F 43/00</a> ){ bundling machines or tools <a href="#">B65B 13/00</a> ; for semiconductors <a href="#">H01L 24/85</a> } |
| 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 {( <a href="#">B21F 27/08</a> takes precedence)}  |
| B21F 15/08        | . . . making use of soldering or welding {( <a href="#">B21F 27/10</a> takes precedence)}   |
| B21F 15/10        | . wire with sheet metal   |
| <b>B21F 17/00</b> | <b>Jacketing or reinforcing articles with wire</b> (by winding <a href="#">B65H 54/00</a> , <a href="#">B65H 81/00</a> ; by braiding <a href="#">D04C</a> )   |
| <b>B21F 19/00</b> | <b>Metallic coating of wire</b> (by extruding <a href="#">B21C 23/24</a> ; by soldering or welding, e.g. cladding or plating <a href="#">B23K</a> ; by other non-mechanical means <a href="#">C23</a> ; electroplating <a href="#">C25D</a> )   |
| <b>B21F 23/00</b> | <b>Feeding wire in wire-working machines or apparatus</b> (applicable also to feeding rods or strips <a href="#">B21D 43/00</a> )   |
| 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 }

**Guidance heading:** 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

**B21F 29/00              Making fencing or like material made partly of wire** ([B21F 25/00](#), [B21F 27/00](#) take precedence)

B21F 29/02      .      comprising bars or the like connected by wires

**B21F 31/00              Making meshed-ring network from wire**

|                   |  |
|-------------------|--|
| <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> }) |
| B21F 45/002       | . {of frames for spectacles}   |
| B21F 45/004       | . {Mounting bails on containers}   |

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|-------------------|--|
| B21F 45/006       | . { of concrete reinforcement fibres}  |
| B21F 45/008       | . { of medical instruments, e.g. stents, corneal rings (medical science <a href="#">A61</a> )} |
| B21F 45/02        | . of clothes hangers   |
| B21F 45/04        | . of elements, e.g. levers or links, for bottle stoppers                                       |
| B21F 45/06        | . of flexible shafts or hollow conduits, e.g. for Bowden mechanisms                            |
| B21F 45/08        | . of loom heddles  |
| B21F 45/10        | . of cards for fabric-napping machines   |
| B21F 45/12        | . of fishing hooks   |
| B21F 45/14        | . of end-pieces for laces or ropes   |
| B21F 45/16        | . of devices for fastening or securing purposes  |
| B21F 45/18        | . . of slide fastener elements   |
| B21F 45/20        | . . of springs hooks; of spring safety hooks   |
| B21F 45/22        | . . of paper fasteners or clips ( <a href="#">staples B21F 45/24</a> )                         |
| B21F 45/24        | . . of staples; of belt-fastening elements   |
| B21F 45/26        | . . of buttons   |
| B21F 45/28        | . . . 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>                        |