

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

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| B21F 11/00 | Cutting wire (hand cutting tools B26B) |
| B21F 11/005 | <ul style="list-style-type: none"> • {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 | <ul style="list-style-type: none"> • wire with wire |
| B21F 15/04 | <ul style="list-style-type: none"> • . without additional connecting elements or material, e.g. by twisting |
| B21F 15/06 | <ul style="list-style-type: none"> • . with additional connecting elements or material {(B21F 27/08 takes precedence)} |
| B21F 15/08 | <ul style="list-style-type: none"> • . . making use of soldering or welding {(B21F 27/10 takes precedence)} |
| B21F 15/10 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • {Feeding means specially adapted for handling various diameters of wire or rod} |
| B21F 23/005 | <ul style="list-style-type: none"> • {Feeding discrete lengths of wire or rod} |
| B21F 23/007 | <ul style="list-style-type: none"> • . {using pick-up means, e.g. for isolating a predefined number of wires from a bundle} |

Wire working characterised by the particular articles produced

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| 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 | <ul style="list-style-type: none"> • {Wire network per se} |
| B21F 27/02 | <ul style="list-style-type: none"> • without additional connecting elements or material at crossings, e.g. connected by knitting |
| B21F 27/04 | <ul style="list-style-type: none"> • . Manufacturing on machines with rotating blades or formers |
| B21F 27/06 | <ul style="list-style-type: none"> • . Manufacturing on twister-gear machines |
| B21F 27/08 | <ul style="list-style-type: none"> • with additional connecting elements or material at crossings |
| B21F 27/10 | <ul style="list-style-type: none"> • . 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
- B21F 33/00**

Tools or devices specially designed for handling or processing wire fabrics or the like
- 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
- B21F 35/00**

Making springs from wire (by coiling wire [B21F 3/00](#); making resilient rings [B21F 37/02](#))
- 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
- B21F 37/00**

Manufacture of rings from wire (in chain making [B21L](#); making of tyre beads [B29D 30/48](#))
- B21F 37/02
 - of resilient rings, e.g. key-rings
- B21F 37/04
 - of washers ([B21F 37/02](#) takes precedence)
- B21F 39/00**

Making wheel spokes from wire

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| B21F 41/00 | Making umbrella frames or members from wire |
| B21F 43/00 | Making bands, e.g. bracelets, or wire (making chains B21L ; using looms D03D) |
| B21F 45/00 | Wire-working in the manufacture of other particular articles (of pins, needles, nails, hairpins B21G ; of chains B21L ; {for semiconductor devices H01L 24/42 }) |
| B21F 45/002 | • {of frames for spectacles} |
| B21F 45/004 | • {Mounting bails on containers} |
| B21F 45/006 | • {of concrete reinforcement fibres} |
| B21F 45/008 | • {of medical instruments, e.g. stents, corneal rings (medical science A61)} |
| 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 (staples B21F 45/24) |
| B21F 45/24 | • . of staples; of belt-fastening elements |
| B21F 45/26 | • . of buttons |
| B21F 45/28 | • . . of "patent-fastener" or press-button type |
| B21F 99/00 | Subject matter not provided for in other groups of this subclass |