

**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)

**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
- 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**
  
- 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**