

## 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](#))

### Definition statement

*This place covers:*

Methods as well as devices relating to working or processing of metal wire, i.e. modifying, not manufacturing the wire:

Wire working methods characterized by their technology (e.g. bending, coiling, etc). These aspects are covered by [B21F 1/00-B21F 23/005](#)

Wire working methods characterized by the product made (e.g. barbed wire, wire network etc). These aspects are covered by [B21F 25/00-B21F 45/28](#)

Miscellaneous wire working and processing. These aspects are covered by [B21F 99/00](#)

### References

#### Limiting references

*This place does not cover:*

Metal rolling methods of mills for making wire or material of like small cross-section	<a href="#">B21B 1/16</a>
Manufacture of metal sheets, wire, rods, tubes or like semi-manufactured products by drawing	<a href="#">B21C 1/00</a>
Devices for straightening wire or like work combined with or specially adapted for use in connection with drawing or winding machines or apparatus	<a href="#">B21C 19/00</a>
Manufacture of rods or wire by metal working	<a href="#">B21C 37/04</a>
Devices for cleaning metal products, e.g. wires , combined with or specially adapted for use with machines or apparatus provided in <a href="#">B21C</a>	<a href="#">B21C 43/00</a>
Winding-up, coiling or winding-off metal wires, metal band or other flexible metal material characterised by features relevant to metal processing only	<a href="#">B21C 47/00</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Jewellery; Bracelets: Other personal ornaments; coins	<a href="#">A44C</a>
Working or processing of sheet metal or metal tubes, rods or profiles without essentially removing material; punching	<a href="#">B21D</a>
Making needle, pins or nails	<a href="#">B21G</a>
Making chains	<a href="#">B21L</a>
Making alloys containing metallic or non-metallic fibres or filaments	<a href="#">C22C 47/00</a>
Building	<a href="#">E04</a>

Semi-conductor devices; electric solid state devices not other wise provided for
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<a href="#">H01L</a>
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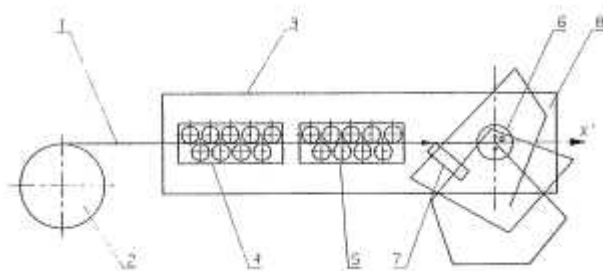
## B21F 1/00

### Bending wire other than coiling; Straightening wire

#### Definition statement

*This place covers:*

Methods and devices for bending wire, i.e. forming discrete angles, as well as straightening, i.e. removing distortions.



Source: WO9324254

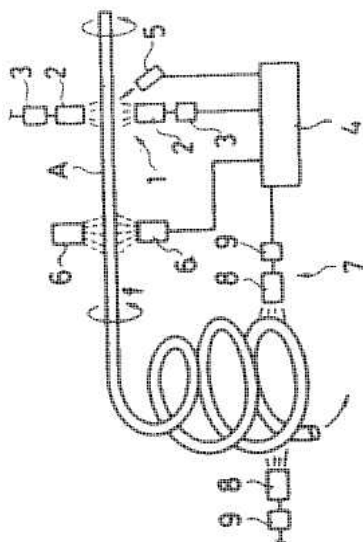
## B21F 3/00

### Coiling wire into particular forms

#### Definition statement

*This place covers:*

Methods and devices for coiling wire, i.e. forming a continuous angle along the wire length.



Source: JP58192643

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Making springs from wire	<a href="#">B21F 35/00</a>
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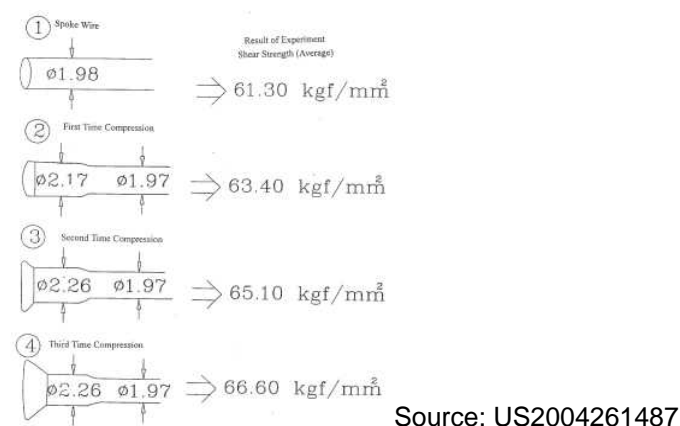
## B21F 5/00

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

### Definition statement

*This place covers:*

Methods and devices for enlarging a wire cross-section by applying an axial force.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

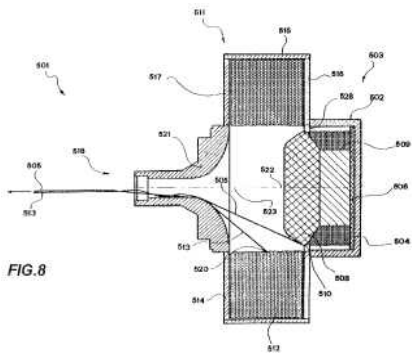
Methods for forging, hammering or pressing to perform upsetting	<a href="#">B21J 5/08</a>
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B21F 7/00

Twisting wire; Twisting wire together (for connections of limited size  
[B21F 15/04](#))

Definition statement

*This place covers:*  
Methods and devices for continuously twisting of wire, i.e. twisting of a wire of theoretically unlimited length.



Source: EP1693126

References

Limiting references

*This place does not cover:*

Connecting wire with wire without additional connecting element or material, e.g. by twisting	<a href="#">B21J 15/04</a>
Electrically-conductive connections between two or more conductive members in direct contact effected by twisting wire	<a href="#">H01R 4/12</a>

Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Jacketing or reinforcing articles with wires	<a href="#">B21F 17/00</a>
Wire working in the manufacture of flexible shafts or hollow conduits, e.g. for Bowden mechanisms	<a href="#">B21F 45/06</a>
Producing bead-rings or bead-cores	<a href="#">B29D 30/48</a>
Methods or apparatus specially adapted for manufacturing, assembling, maintaining or repairing dynamo-electric machines	<a href="#">H02K 15/20</a>

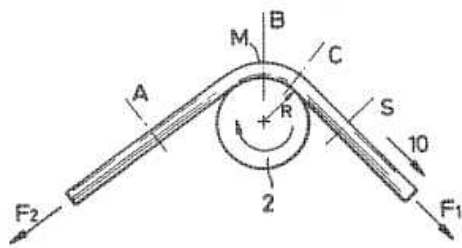
**B21F 9/00**

**Straining wire (straining prestressing wires for concrete [E04G 21/12](#); connections or attachments adapted for straining [F16G 11/00](#); {bundling machines or tools [B65B 13/00](#)})**

**Definition statement**

*This place covers:*

Methods and devices for straining wires, i.e. tensioning wires with or without plastic deformation.



Source: WO9429046

**References**

**Limiting references**

*This place does not cover:*

Connections or attachments adapted for straining of cables, ropes or wire	<a href="#">F16G 11/12</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

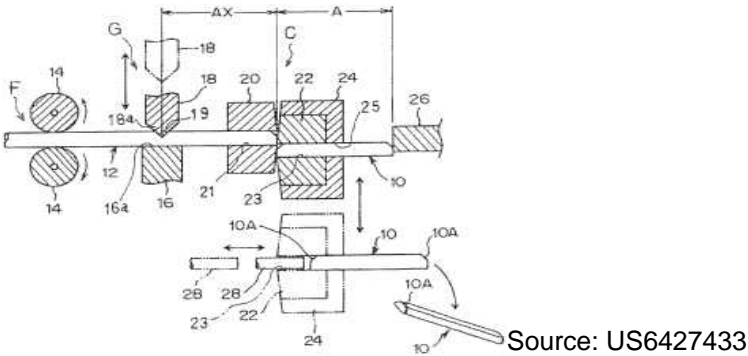
Straightening wire	<a href="#">B21F 1/02</a>
Bundling machines or tools	<a href="#">B65B 13/00</a>
Hand tools for cable tie applications	<a href="#">B65B 13/027</a>
Pre-stressing building material	<a href="#">E04G 21/12</a>

B21F 11/00

Cutting wire (hand cutting tools [B26B](#))

Definition statement

*This place covers:*  
Methods and devices for cutting wire



References

Limiting references

*This place does not cover:*

Cutting wire nets	<a href="#">B21F 33/005</a>
Hand operated metal-shearing devices for cutting wires	<a href="#">B23D 29/023</a>

Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Machines or devices for shearing or cutting profiled stock	<a href="#">B23D 23/00</a>
Hand-held cutting tools not otherwise provided for	<a href="#">B26B</a>
Hand cutting tools using wires as cutting means	<a href="#">B26B 27/002</a>
Cutting	<a href="#">B26D</a>

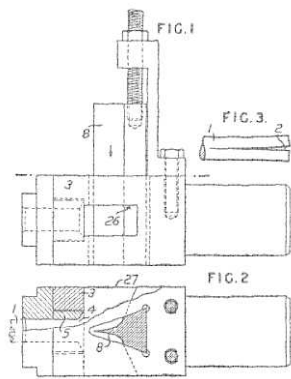
B21F 13/00

Splitting wire

Definition statement

*This place covers:*

Methods and devices for splitting, i.e. separating wire portions lengthwise.



Source: GB786261

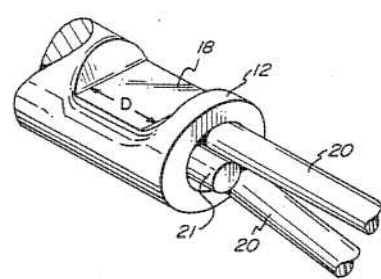
B21F 15/00

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](#)})

Definition statement

*This place covers:*

Methods and devices for connecting wire to wire or other metallic material; connecting parts by means of wire.



Source: US5224955

References

Limiting references

*This place does not cover:*

Straining wire by tools also adapted for making connections	<a href="#">B21F 9/02</a>
Making wire networks with additional connecting elements or material at crossings	<a href="#">B21F 27/08</a>
Making wire networks with welded or soldered crossings	<a href="#">B21F 27/10</a>

Applying and securing binding material around articles using strings, wires, strips, bands, tapes	<a href="#">B65B 13/02</a>
Attaching or detaching leads of semi-conductors	<a href="#">H01L 24/80</a>

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Jacketing or reinforcing articles with wire	<a href="#">B21F 17/00</a>
Making bands, e.g. bracelets of wire	<a href="#">B21F 43/00</a>
Soldering or unsoldering; Welding	<a href="#">B23K</a>

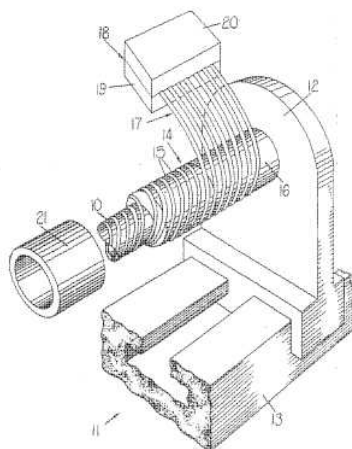
## B21F 17/00

**Jacketing or reinforcing articles with wire (by winding [B65H 54/00](#), [B65H 81/00](#); by braiding [D04C](#))**

### Definition statement

*This place covers:*

Methods and devices for jacketing articles with wire, i.e. winding one or more wire around an article (which article can be a wire); reinforcing articles with wire (e.g. reinforcing paper with wire).



Source: GB1324072

### References

#### Limiting references

*This place does not cover:*

Jacketing or reinforcing of articles with wires by winding or coiling	<a href="#">B65H 54/00</a> , <a href="#">B65H 81/00</a>
Making alloys containing metallic or non-metallic fibres or filaments by forming the fibres or filaments into a preformed structure from wires or filaments only	<a href="#">C22C 47/062</a>
Jacketing or reinforcing of articles with wires by braiding	<a href="#">D04C</a>

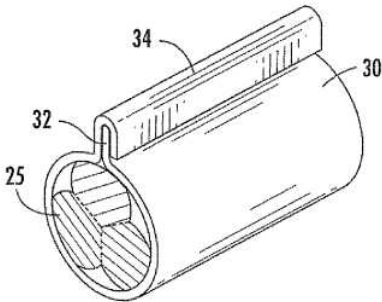


B21F 19/00

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](#))

Definition statement

This place covers:  
Methods and devices for coating metal wires, e.g. by using a metal band.



Source: US2009311553

References

Limiting references

This place does not cover:

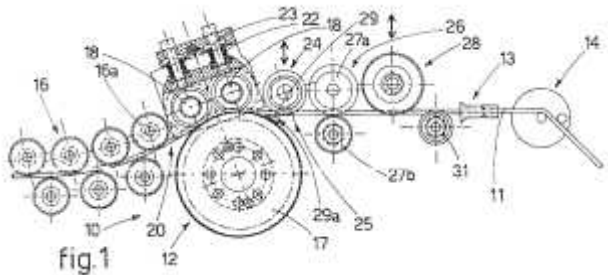
Coating of wire by extrusion	<a href="#">B21C 23/14</a>
Coating of wire by soldering or welding, e.g. cladding or plating	<a href="#">B23K</a>
Coating of wire by other non-mechanical means	<a href="#">C23</a>
Coating of wire by electroplating	<a href="#">C25D</a>

B21F 23/00

Feeding wire in wire-working machines or apparatus (applicable also to feeding rods or strips [B21D 43/00](#))

Definition statement

This place covers:  
Methods and devices for feeding wire.



Source: EP0824982

## References

### Limiting references

*This place does not cover:*

Guiding wire	<a href="#">B21F 99/00</a>
Feeding wire in wire-working machines, said machines also being applicable to feed rods or strips	<a href="#">B21D 43/00</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Arrangements for moving, supporting or positioning work specially adapted for metal rolling mills	<a href="#">B21B 39/006</a>
Forwarding filamentary material	<a href="#">B65H 51/00</a>

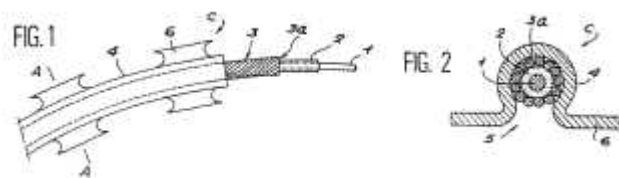
## B21F 25/00

### Making barbed wire

#### Definition statement

*This place covers:*

Methods and devices for making barbed wires or barbed tapes.



Source: GB2300206

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Barbed wires	<a href="#">F41H 11/08</a>
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## 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](#))**

### Definition statement

*This place covers:*

Methods and devices for making wire networks, e.g. fences or reinforcements for concrete.

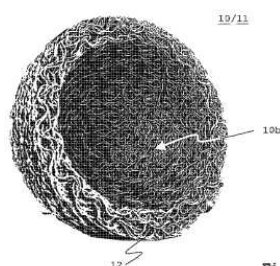


Fig. 4.c Source: EP2153800

### References

#### Limiting references

*This place does not cover:*

Making fencing or the like partly of wire	<a href="#">B21F 29/00</a>
Making meshed ring network from wire	<a href="#">B21F 31/00</a>
Making bands from wire	<a href="#">B21F 43/00</a>
Making other particular articles from wire	<a href="#">B21F 45/00</a>
Making wire network using looms	<a href="#">D03D</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Connecting wire to wire or other metallic material	<a href="#">B21F 15/00</a>
Bending wire networks	<a href="#">B21D 11/125</a>
Soldering or unsoldering; Welding	<a href="#">B23K</a>
Reinforcing elements, e.g. for concrete	<a href="#">E04C 5/00</a>
Fencing	<a href="#">E04H 17/00</a>

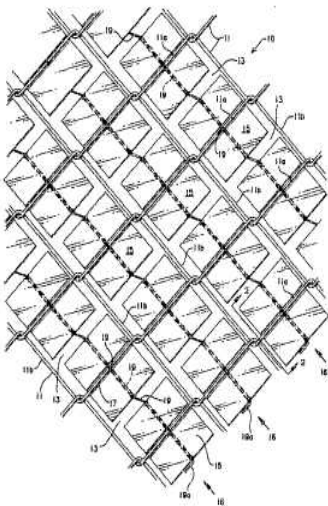
**B21F 29/00**

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

**Definition statement**

*This place covers:*

Methods and devices for making structures partly of wire and partly of other elements, e.g. fences reinforced with bars.



Source: US4651975

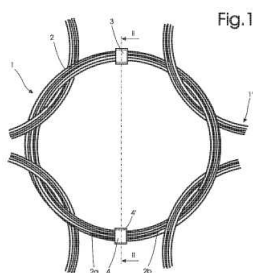
**B21F 31/00**

**Making meshed-ring network from wire**

**Definition statement**

*This place covers:*

Methods and devices for making networks, e.g. fences, obtained by interlacing rings of metal wires, e.g. fences for securing rocks.



Source: EP1662047

**Special rules of classification**

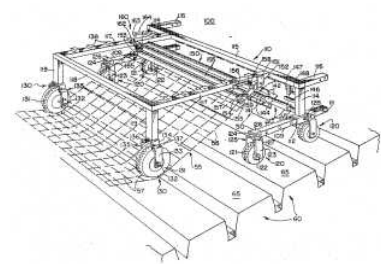
Interlaced rings can be of non-circular shape.

**B21F 33/00**

**Tools or devices specially designed for handling or processing wire fabrics or the like**

**Definition statement**

*This place covers:*  
Methods and devices for handling or processing wire fabrics, i.e. further handling or processing of products manufactured from wire (e.g. connecting wire products, coiling wire products, etc).



Source: US3814144

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Bending of wire networks	<a href="#">B21D 11/125</a>
Upholstery	<a href="#">B68</a>

**B21F 35/00**

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

**Definition statement**

*This place covers:*  
Methods and devices for making springs from wire.  
  
Miscellaneous spring manufacturing processes, not necessarily starting from wire, not otherwise provided for.

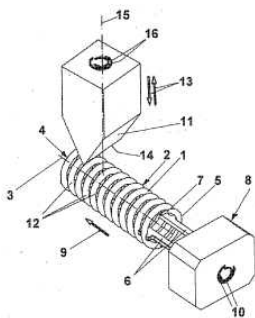


Fig. 1 Source: EP1533053

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Bending wire other than coiling	<a href="#">B21F 3/00</a>
Manufacture of resilient rings	<a href="#">B21F 37/02</a>
Springs	<a href="#">F16F 1/00</a>

## B21F 37/00

Manufacture of rings from wire (in chain making [B21L](#); making of tyre beads [B29D 30/48](#))

### Definition statement

*This place covers:*

Methods and devices for the manufacture of rings from wire.

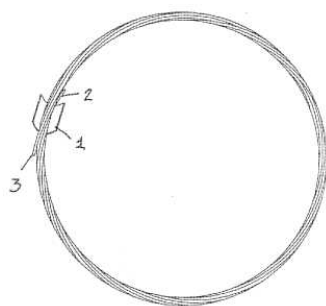


FIG. 1

Source: EP1504828

## References

### Limiting references

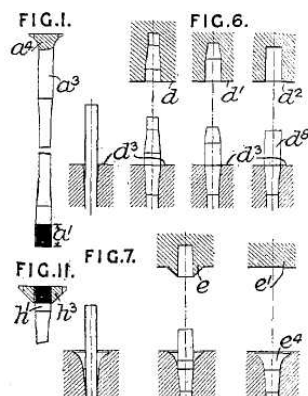
*This place does not cover:*

Manufacture of rings in chain making	<a href="#">B21L</a>
Manufacture of rings in tyre beads making	<a href="#">B29D 30/48</a>

**B21F 39/00****Making wheel spokes from wire****Definition statement**

*This place covers:*

Methods and devices for the manufacture of wheel spokes from wire.

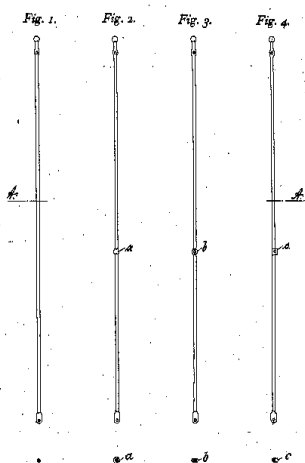


Source: GB357081

**B21F 41/00****Making umbrella frames or members from wire****Definition statement**

*This place covers:*

Methods and devices for the manufacture of umbrella frames or members from wire.



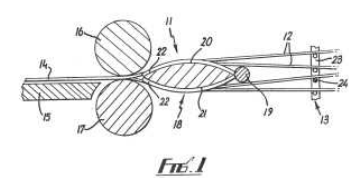
Source: DE177303

B21F 43/00

Making bands, e.g. bracelets, or wire (making chains [B21L](#); using looms [D03D](#))

Definition statement

*This place covers:*  
Methods and devices for the manufacture of bands or bracelets from wire.



Source: GB2079336

References

Limiting references

*This place does not cover:*

Making bands using looms	<a href="#">D03D</a>
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Informative references

Attention is drawn to the following places, which may be of interest for search:

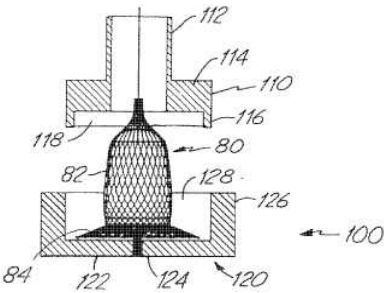
Bracelets	<a href="#">A44C 5/00</a>
Making chains	<a href="#">B21L</a>

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](#)})

Definition statement

*This place covers:*  
Methods and devices for the manufacture of all wire products if neither classifiable in a sub-group of [B21F 45/00](#) nor in a class ranging from [B21F 25/00](#)-[B21F 43/00](#) nor in a specific product class.



Source: US2002198561



**References****Limiting references**

*This place does not cover:*

Wire working in the manufacture of pins, needles, mails, hairpins	<a href="#">B21G</a>
Wire working in the manufacture of chains	<a href="#">B21L</a>
Wire working for semi-conductor devices	<a href="#">H01L 24/42</a>

**B21F 99/00**

**Subject matter not provided for in other groups of this subclass**

**Definition statement**

*This place covers:*

Subject-matter not provided for in other groups of this subclass concerning the working and processing of wire, such as e.g. heat treatments specifically adapted for wires.