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(54) **Tennis-type chain for jewelry and method of manufacture**

(57) The present invention relates to a method for making a chain link for jewelry and goldsmith's applications, comprising the steps of: cutting (202, 203, 205, 206) an outline (207, 601) from a flat metal strap (101), the outline (207, 601) having a main development direction (501) that defines two ends (502, 503) thereof, wherein the outline comprises at least two junction tines (602, 603), each one situated at a respective one of the two ends (502, 503), the junction tines being arranged on the flat metal strap (101) in a direction transversal to the main development direction (501); bending (301,

302) the at least two junction tines (602, 603) to bring them on respective bending planes which are transversal to the plane of the flat metal strap (101); bending (303, 304) the outline (401, 701) along at least one bending line which is transversal to the main development direction (501), thus placing the two ends (502, 503) against each other to close the link (701), wherein the junction tines (602, 603) face outwards from said link (701). The present invention also concerns a related chain link, a related chain, and a related device for making a chain link.

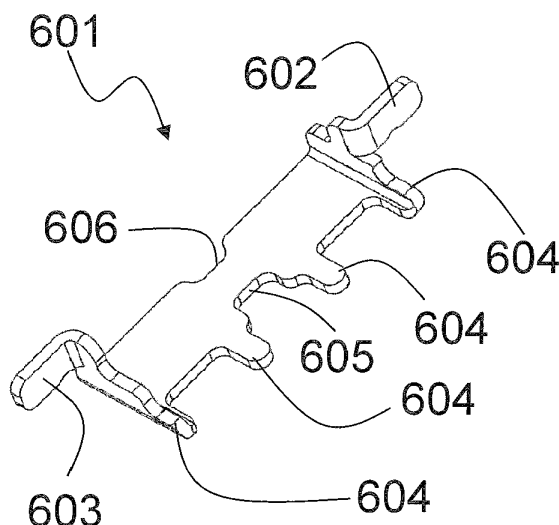


FIG. 6

Description

[TECHNICAL FIELD]

[0001] The present invention relates to a method for making a chain link for jewelry and goldsmith's applications, as well as to a chain link and a device for manufacturing it.

[PRIOR ART]

[0002] In the jeweller and goldsmith's art, necklaces and other accessories, such as bracelets and earrings, are known which are chain-shaped, i.e. they include a series of chained metal links which may also be made of precious metals, e.g. gold. In these links, gemstones of various nature can be set, wrought into various faceted shapes, such as zircons or precious or semi-precious gems, including natural gemstones. Such links are therefore given suitable shapes, such as cylinders, cubes and rectangular prisms.

[0003] The chain of the present invention belongs to the typology commonly referred to as "tennis chain" or "cup chain".

[0004] In a tennis chain, the links have a partial or through central cavity; on the side which is open to allow the gem to be positioned (called "setting") there are prongs which, when appropriately wrought, allow to lock the gem in the desired position. In addition, the links of a tennis chain may feature side slots useful for both connecting the links together and allowing more light to pass, thus improving the brilliance of the gems used in the jewel. Tennis chain links are known to be manufactured through microcasting processes using lost wax models. In this case, the connection between the links is obtained by means of a suitably modelled peduncle or by inserting an additional element between the links, generally consisting of a suitably shaped ring. As a rule, a weld is made on the connection element in order to improve the strength of the manufactured article. These steps are carried out manually by using specific jigs and tools.

[0005] Microcast solutions suffer from the drawback that the necklace becomes heavy due to the fact that the links are substantially solid and their thickness must be such as to allow them to be obtained by microcasting; since gold is expensive, this weight translates into high cost of the raw materials needed for manufacturing the necklace, which is not desirable for products intended for large market portions. Additionally, microcast solutions also have the drawback that they require manual work for assembling and welding the links and for setting the gems, so that production volumes are necessarily limited.

[0006] Tennis chain links are known to be manufactured through mechanical chip-removal machining processes, typically by micromilling.

[0007] The links obtained by micromilling suffer from the drawback that the necklace is heavy due to the fact

that the links are substantially solid; this translates into high raw material costs. Furthermore, the machining process removes precious material from the necklace, which is then difficult to recover. Finally, although micromilling gives a pleasant appearance and can be automated to a certain extent, it has the drawbacks that it is complex due to the small dimensions of the manufactured articles and that it does not leave much freedom in creating complex shapes.

[0008] Tennis chain links are also known to be made by mechanically pressing a flat strap, e.g. as described in patents US1573927, US6412303 and US4781038. In these cases, the strap is suitably shaped to create links having the shape of a cube or a polygonal-base prism, in which gems can be set. The pressing solution allows to manufacture links which are lighter than those obtained by microcasting or micromilling.

[0009] One solution for making tennis chain links by pressing a flat strap is described in patent application WO2011/086514A2 and in the corresponding Italian patent application MI2010A000037 by OMBI S.r.l., which relates to a method for making a chain link for jewelry and goldsmith's applications. According to document WO2011/086514A2, an outline of the link is cut from a flat metal strap, in which a pair of passage slots and a pair of junction tines are obtained; the junction tines are bent outwards from the link, which is then bent to place the ends thereof one against the other. In order to manufacture a chain, the junction tines of an adjacent link are inserted into said passage slots, thereby creating a connection.

[0010] However, even the solution known from WO2011/086514A2, although it allows making links having various shapes and manufacturing chains in a simple manner, still needs improvement.

[0011] In general, the solutions known in the art for making chain links by pressing a flat strap do not allow to easily produce links having very small dimensions, in terms of both their diameter and strap thickness. In fact, the dimensions of the link must be a compromise between lightness and resistance to mechanical stress when the chain is worn, and the solutions known in the art typically do not allow the use of diameters smaller than 1.50 mm.

[0012] Considering the costs of the precious metals that the link is typically made of, and the costs of the natural gemstones (diamonds, emeralds, topazes, etc.) to be set, the known links are not optimal for certain applications.

[OBJECTS AND SUMMARY OF THE INVENTION]

[0013] It is one object of the present invention to provide a chain link for jewelry and goldsmith's applications as well as a method and a device for manufacturing it, which allow to overcome some of the drawbacks of the prior art.

[0014] It is a particular object of the present invention

to provide a method for making a chain link which allows to obtain a link that can be manufactured easily by using automatic machinery.

[0015] It is another object of the present invention to provide a chain link having a strong and light structure, so that chains of small dimensions can be made, resulting in savings in terms of precious metal, while at the same time providing strong chains that can be worn with peace of mind.

[0016] Finally, it is a further object of the present invention to provide a chain link which can be manufactured easily in a plurality of shapes, even complex ones, having more elegant proportions that improve the appearance and charm thereof.

[0017] These and other objects of the present invention are achieved through a method for making a chain link for jewelry and goldsmith's applications, a chain link and a device for making said link as set out in the appended claims, which are intended to be an integral part of the present description.

[0018] One idea at the basis of the present invention is to provide a method for making a chain link for jewelry and goldsmith's applications, comprising the steps of: cutting an outline from a flat metal strap, the outline having a main development direction that defines two ends of the outline itself, wherein the outline comprises at least two junction tines, each one situated at a respective one of the two ends, the junction tines being arranged on the flat metal strap in a direction transversal to the main development direction; bending the at least two junction tines to bring them on respective bending planes which are transversal to the plane of the flat metal strap; bending the outline along at least one bending line which is transversal to the main development direction, thus placing the two ends against each other to close the link, wherein the junction tines face outwards from said link.

[0019] The present solution allows to overcome the drawbacks of the prior art; first and foremost, it allows to manufacture a chain link in a simple and quick manner, also by means of automatic production methods. The link can advantageously have various cross-sections, e.g. circular or square or more complex, as defined by the bending thereof along the at least one bending line, into which gems can be set.

[0020] In addition, the present solution allows to produce lighter links that utilize a smaller quantity of raw material; in fact, the particular structure of the link is more suitable for the use of thin flat straps and for smaller dimensions, the link diameter being as small as 1.00 mm or even less. Such dimensions become particularly advantageous when the link is used for setting natural gemstones.

[0021] At the same time, the present solution allows to produce links that, while still strong, can be worn as jewels without the risk of frequent breaks.

[0022] Finally, the present solution allows to produce links having a more elegant shape, advantageously being lower than the links according to the prior art, being

as low as 1.10 mm or less, wherein the height of the link may even be less than the diameter thereof.

[0023] In addition to the resulting material saving, a chain comprising links according to the present solution has proportions that reduce its tendency to "overturn" when bent for being worn as necklaces, thus more elegantly exposing its gems.

[0024] Preferably, a step of shearing, i.e. partially cutting or semi-cutting, each one of the junction tines is carried out in order to facilitate the bending thereof; the junction tines protrude, in particular, from opposite edges of the outline when they lie on the plane of the flat metal strap, with respect to said main development direction.

[0025] Preferably, the outline of the link comprises at least one central recess (preferably two substantially symmetrical central recesses), which is adapted to reduce the height of the link to dimensions compatible with the distance between the bending planes on which the junction tines lie, said distance being in particular equal to or greater than the height of said link at said at least one central recess.

[0026] Advantageously, the links are connected together by means of tines obtained as one piece from the outline, which are inserted into the recesses of an adjacent link of the chain and are bent against each other to create a linking of the chain, wherein the tines are preferably welded together head to head.

[0027] This type of connection provides the additional advantage that the chain, when worn as a necklace, will naturally tend to stay in the correct position, i.e. with the gems exposed.

[0028] The present invention also concerns a related chain link for jewelry and goldsmith's applications, comprising: a central body having an outline cut from a flat metal strap, the outline having a main development direction defining two ends of the outline, wherein the outline is bent along at least one bending line which is transversal to the main development direction, thus placing the two ends against each other to close the link, and further comprising at least two junction tines facing outwards from the link, each one of the at least two junction tines being situated at a respective one of said two ends; the junction tines are formed in the flat metal strap, having directions that are transversal to the main development direction, wherein the at least two junction tines are further bent on respective bending planes which are transversal to the bending line along which the outline was bent. Preferably, the junction tines comprise a sheared portion obtained as one piece from opposite edges of the outline with respect to the main development direction.

[0029] Preferably, the link comprises at least one central recess that reduces the height thereof, wherein the junction tines of an adjacent link are adapted to engage, externally to the link, into the recess, so as to form a coupling between adjacent links for creating a chain. Preferably, the junction tines are then adapted to be bent around the adjacent link until they are placed against each other, being then preferably welded together head

to head. Preferably, the link comprises a plurality of prongs adapted to hold at least one gem, e.g. a diamond, within the central body, the prongs being located on at least one support surface formed on at least one edge of the outline, other than the ends of the latter, for improving the brilliance and charm of the chain itself.

[0030] The present invention further relates to a chain for jewelry and goldsmith's applications, comprising a plurality of links, and to a device for making chain links for jewelry and goldsmith's applications, comprising means configured for implementing said method. Further particular and advantageous aspects will become more apparent from the following detailed description and from the appended claims, which are an integral part of the present description.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[0031] Some preferred and advantageous embodiments will now be described by way of nonlimiting example with reference to the annexed drawings, wherein:

- Figure 1 shows a flat strap from which a chain link according to the present invention is made.
- Figure 2 shows in detail a first portion of the strap of Figure 1.
- Figure 3 shows in detail a second portion of the strap of Figure 1.
- Figure 4 shows in detail a third portion of the strap of Figure 1.
- Figure 5 shows in more detail a fourth portion of the strap of Figure 1, highlighting a semifinished link.
- Figure 6 shows in detail a semifinished link in the non-bent configuration.
- Figure 7 shows in detail the semifinished link of Figure 6 in the bent configuration, forming a closed link.
- Figure 8 shows a first step of connecting links together according to the present invention.
- Figure 9 shows a second step of connecting links together according to the present invention.
- Figure 10 shows a third step of connecting links together according to the present invention.
- Figure 11 shows a fourth step of connecting links together according to the present invention.

[0032] The drawings show different aspects and embodiments of the present invention and, where appropriate, similar structures, components, materials and/or elements are designated in the various drawings by the same reference numerals.

[DETAILED DESCRIPTION OF THE INVENTION]

[0033] Figure 1 shows an example of a strap 101 from which links for a chain according to the present invention are obtained. The thickness of the strap 101, typically made of precious metal, is such as to allow it to be easily worked, and is typically comprised between 0.05 mm and

0.3 mm, preferably 0.1 mm; the raw strap 101 is placed into a suitable device, typically a shearing/bending machine, which processes it "continuously" according to known mechanical working methods, so that different portions of the strap 101 represent different link processing stages. For this very reason, while describing the sequence of processing operations to which the strap 101 is subjected, it is possible to exemplify some steps of the process for producing chain links according to the present invention. Said sequence of operations will be described in detail below with reference to the portions 102, 103 and 104 of the strap 101.

[0034] Figure 2 shows in more detail the portion 102 of the strap 101. The processing of the strap 101 begins by making a pilot hole 201 for centering the strap, located in the middle of the width of the strap 101. The width of the strap 101 is such as to allow creating links lying in a plane, and is typically comprised between 4 mm and 20 mm, more preferably between 5 mm and 8 mm; in general, it is determined on the basis of considerations about the desired link size. The pilot hole 201 will be used as a reference during the next processing steps to which the strap 101 will be subjected; the strap's feed pitch must be such as to allow the links to be formed for their entire height, and is preferably comprised between 2 mm and 6 mm, more preferably 3 mm; in general, it is determined on the basis of considerations about the desired link size.

[0035] The processing of the strap 101 continues with a first cutting 202 of the upper contour of the link and a second cutting 203 of the lower contour of the link. As will be described more in detail below, during the cutting steps 202 and 203 suitable recesses are created in the link outline.

[0036] The processing of the strap 101 may optionally include a step of making light slots 204 that will be positioned on the side walls of the link, as will be described in more detail below.

[0037] After this step, there is a step where no machining takes place; the processing of the strap 101 may in fact include steps where no cutting or bending occurs, but which allow to make room lengthwise between the various strap processing stations, where the tools and actuators of the link-making device can be accommodated.

[0038] The processing of the strap 101 continues with a third cutting 205 of the contour of a first end of the link and a fourth cutting 206 of the contour of a second end of the link. Preferably, the cutting steps 205 and 206 take place simultaneously.

[0039] As can be seen, the flat outline 207 of the link is now created by development cutting with less than four bridges of holding material, which keep the flat outline 207 constrained to the strap 101 for the next processing steps. Of course, the material removed from the strap is recovered and melt again, since it usually is precious metal.

[0040] The flat outline 207 has a main development

direction which is transversal to the strap 101 and, in general, to the feeding direction of the strap 101 during the process.

[0041] On the flat outline 207 one can immediately identify two ends which are defined by the main development direction; on these two ends junction tines are obtained, preferably two of them, arranged in a direction which in its turn is transversal to the main direction, i.e. in this case parallel to the feeding direction of the strap 101. In particular, the junction tines protrude from opposite edges of the flat outline 207, in particular one facing in the feeding direction and the other facing in the direction opposite to the feeding direction of the strap 101.

[0042] Four prongs, preferably smaller than the junction tines, can also be identified on the flat outline 207, which are located at the edge of the outline 207 comprised between the two ends.

[0043] On the flat outline 207 one can also identify a pair of slots on those portions of the outline 207 that will be located on walls not engaged by the junction tines; said slots in the link will allow more light to strike the gemstone, to advantage of the brilliance and charm of the jewel. The presence of the slots is optional as far as the processing of the strap is concerned, as will become apparent later on.

[0044] Figure 3 illustrates in more detail the portion 103 of the strap 101. The processing of the strap 101 continues with the bending of the junction tines obtained in the flat outline 207 constrained to the strap 101.

[0045] In particular, a first junction tine is bent 301 onto a first end, along a bending line which is substantially parallel to the main development direction of the flat outline 207. A second junction tine is then bent 302 onto a second end, still along a bending line substantially parallel to the main development direction of the flat outline 207, but in the direction opposite to the bending 301.

[0046] By so doing, both junction tines are bent on bending planes which are substantially transversal to the plane of the strap 101 and of the outline 207.

[0047] Preferably, prior to said bendings 301 and 302, a shearing step is also carried out, wherein the strap material is cut partially without detachment and the junction tines remain connected to the outline, at the leading edge of each junction tine. This facilitates the bending 301 and 302 of the tines without excessive local deformation of the material, thus preventing it from breaking during the process or afterwards. The shearing step is preferably carried out simultaneously with the cutting 205 and 206 of the ends of the outline 207, or it may be carried out afterwards.

[0048] This step may be followed by further steps, e.g. three steps, where no processing takes place.

[0049] The processing of the strap 101 then continues with a partial bending 303 of the outline for raising both ends thereof, wherein the outline is bent along two respective bending lines which are transversal to the main development direction of the outline itself, so as to partially raise the tines, which will thus face outwards from

the strap 101.

[0050] In order to properly and easily carry out the partial bending 303, it is well known to score and/or carve the strap material at the bending line near the inner bending edge, i.e. on the strap surface facing up in the drawing.

[0051] The processing of the strap 101 then continues with a further final bending 304, wherein the ends of the strap 101 are further bent to obtain the desired configuration; in this case, they are placed on a bending plane which is orthogonal to the plane of the strap 101.

[0052] Figure 4 illustrates in more detail the portion 104 of the strap 101.

[0053] After an appropriate number of steps where preferably no processing takes place following the bending 304, a configuration of the outline 401 is obtained wherein the junction tines face outwards from the outline with respect to the axis of the strap, thus being aligned with the main development direction of the link outline.

[0054] The semifinished outline 402 thus obtained can then be detached from the strap 101 by shearing the material bridges on the lower and upper edges of the outline.

[0055] The semifinished outline 402 will then be picked up by an automated transport mechanism and subjected to additional processing steps that will be described below, including further bending steps for creating the chain link.

[0056] In fact, once the link outline has been obtained by pressing, it must be further worked in order to be closed and connected into a chain.

[0057] Figure 5 illustrates in more detail the configurations 303 and 304, wherein the outline is bent in order to raise the junction tines. Said Figure highlights the main development direction 501 of the link, which is, in fact, transversal to the strap 101, and which defines the two ends 502 and 503 where the junction tines are located, which are first bent and then raised outwards from the outline, as previously described. In particular, the junction tines are first obtained with directions transversal to the development direction 501; next, they are bent on bending planes which are transversal to the axis of the flat strap; then they are raised by bending the outline, so as to become transversal to the bending lines that will be used for making the link, as will be further described below.

[0058] Figure 6 illustrates in detail one variant of the semifinished outline 601 of a link according to the present invention; the semifinished outline 601 essentially corresponds to the semifinished outline 402, without however the optional slots for allowing the light through the link.

[0059] The semifinished outline 601 comprises, as already shown, a pair of junction tines 602 and 603, which face outwards from the semifinished outline 601.

[0060] The semifinished outline 601 further comprises four prongs 604 that will be used for setting a gem inside the link, once the latter is completed

[0061] The semifinished outline 601 further comprises a first central recess 605, formed on the lower edge of

the link, and also a respective second central recess 606 formed on the upper edge of the link, where also the prongs are located. The central recesses 605 and 606, which are preferably symmetrical to each other, allow reducing the height of the link in order to make it compatible with the pitch of the junction tines, as will become apparent below.

[0062] The method for making a link comprises a further processing step wherein the semifinished outline 601 is bent three-dimensionally, i.e. the outline is bent along two respective bending lines which are still transversal to the main development direction of the outline 601 itself, so as to raise the side walls of the link.

[0063] Figure 7 illustrates the link 701 obtained by bending the semifinished outline 601 as described above, wherein the same elements are designated by the same reference numerals.

[0064] As can be appreciated, the further bending along lines transversal to the main development direction of the outline allows the ends of the link to be placed against each other to create a closed loop. In this manner, the link 701 forms a substantially box-like structure with four transversal bending lines, with curved corners and without a bottom.

[0065] Therefore, the link ends to be matched have a compatible shape, e.g. as shown in the drawing. In general, the ends of the outline have such a shape as to ensure a perfect coupling when the outline is bent to form the link, which can then be further subjected to local welding in order to obtain a strong junction.

[0066] In the link 701, the junction tines 603 and 604 face outwards, and one can appreciate that the thickness of the junction tines equals that of the link walls, since all these elements are obtained from the same metal strap having a constant thickness.

[0067] Once bent, the junction tines 603 and 604 turn out to lie on respective bending lines which are transversal to the four bending lines along which the outline was bent, as previously described.

[0068] In particular, the distance between the planes in which the junction tines 603 and 604 lie is equal to or slightly greater than the height of the link at the recesses 605 and 606; this advantageously allows the links to be connected together into a chain, as will be described below.

[0069] According to a preferred embodiment of the present invention, therefore, the chain link 701 for jewelry and goldsmith's applications comprises side walls bent around a central axis, thus creating a box-like shape having a substantially polygonal cross-section; inside, the link is completely hollow, and there is a through aperture at the central axis. The setting, i.e. that portion into which the gem is to be set, is formed in the region of the link 701 that comprises the prongs 604. The gem rests on suitable support surfaces, and the prongs 604, when bent downwards, hold the gem within the setting.

[0070] Figure 8 illustrates an initial step for connecting the links into a chain according to the present invention.

A semifinished outline 601, obtained through the above-described pressing process, is brought near a link 701. The link 701 is preferably already connected to a plurality of links 801 connected together into a chain.

[0071] Figure 9 illustrates a second step for connecting the links into a chain according to the present invention. The semifinished outline 601 is inserted, at its recesses, into the junction tines of the adjacent link 701, this coupling being allowed by the particular geometry of the recesses and of the tines, as previously described.

[0072] Figure 10 illustrates a third step for connecting the links into a chain according to the present invention. The link 701 is further processed by bending the junction tines inwards, until they are placed substantially against each other. This creates the linking of the chain.

[0073] The link 701 is thus connected into a chain, having become similar to the above-mentioned links 801.

[0074] Preferably, the countered junction tines are welded together head to head by local laser welding 1001 in order to improve the strength of the chain.

[0075] Figure 11 illustrates a fourth step for connecting the links into a chain according to the present invention. The outline 601 is in fact bent, as previously described, into the configuration 701 shown in the drawing.

[0076] Preferably, a local laser welding 1011 is carried out on the ends 502 and 503, which have been placed against each other as previously described, in order to further improve the strength of the chain.

[0077] This leads to a chain configuration wherein the linking is complete; when comparing Figure 11 and Figure 8, one can appreciate that the chains shown therein are the same, except for a different number of links. It is therefore apparent that, according to the present invention, the chain can then be fed by a distance equal to its pitch, and then the above-described steps can be repeated in order to create a new link.

[0078] In particular, an automatic device can be conceived for making chain links and chains for jewelry and goldsmith's applications, which comprises means configured for implementing the above-described method. As can be understood, a link according to the present invention is well suited for production by means of fully automated machinery, during a "sequential" process for creating a chain of interconnected links. Because of the effectiveness of the method for making a chain link according to the present invention, some existing machinery can advantageously be adapted and re-configured for implementing the method proposed herein.

[0079] A chain for jewelry and goldsmith's applications comprising a plurality of links made in accordance with the present invention is very strong, because the stress generated when placing the gem into the setting is distributed evenly along the entire edge of the link, without any free corners weakening the structure.

[0080] Furthermore, the connection between the links by means of junction tines coupled to respective recesses of an adjacent link allows the chain to remain in the correct position when worn, i.e. with the gems exposed

and without any torsion about the longitudinal axis. In addition to saving material, a chain link made in accordance with the present invention also allows reducing the height of the link itself to approx. 1.10 mm. This change of proportions, which can advantageously be attained through the method of the present invention, further contributes to improving the behaviour of the chain when it is worn as a necklace, with less tendency to overturn.

[0081] In the light of the above description of some preferred and advantageous embodiments of the present invention, it will be apparent to the man skilled in the art that the invention may be subject to further modifications and variations.

[0082] For example, it is clear that links having different cross-sections than the one described herein, e.g. rectangular or circular or hexagonal or octagonal, can be made, as well as more complex shapes, e.g. elliptical or lobed ones, by simply bending the flat outline in a different manner, along at least one bending line.

[0083] Furthermore, if the link dimensions allow, the number of times may be greater than two, typically always in pairs.

Claims

1. A method for making a chain link for jewelry and goldsmith's applications, comprising the steps of:

- cutting (202, 203, 205, 206) an outline (207, 601) from a flat metal strap (101), said outline (207, 601) having a main development direction (501) that defines two ends (502, 503) of said outline (207, 601), wherein said outline comprises at least two junction tines (602, 603), each one of said at least two junction tines (602, 603) being situated at a respective one of said two ends (502, 503), said junction tines being arranged on said flat metal strap (101) in a direction transversal to said main development direction (501);
- bending (301, 302) said at least two junction tines (602, 603) to bring them on respective bending planes which are transversal to the plane of said flat metal strap (101);
- bending (303, 304) said outline (401, 701) along at least one bending line which is transversal to said main development direction (501), thus placing said two ends (502, 503) against each other to close said link (701), wherein said junction tines (602, 603) face outwards from said link (701).

2. A method according to claim 1, wherein each one of said junction tines (602, 603) is sheared for facilitating said bending (301, 302) of said at least two junction tines (602, 603), and wherein said at least two junction tines (602, 603) protrude from opposite edges

of said outline (207) on said flat metal strap (101) with respect to said main development direction.

3. A method according to claim 1 or 2, wherein said outline (207) comprises at least one central recess (605, 606) adapted to reduce the height of said link (601, 701), and wherein said respective bending planes are different from each other and are spaced apart by a distance which is equal to or greater than said height of said link (601, 701) at said at least one central recess (605, 606).

4. A method according to claim 3, further comprising the step of: inserting said at least two junction tines (602, 603) into a recess of a corresponding adjacent link (601) to create said chain (801).

5. A method according to claim 4, further comprising the step of: further bending said at least two junction tines (602, 603) around said adjacent link (601) to place them against each other in order to create a linking of said chain (801), wherein said junction tines (602, 603) are preferably welded (1001) together head to head.

6. A method according to any one of claims 1 to 5, wherein said ends (502, 503) placed against each other have compatible shapes when countered, and further comprising the step of: welding (1011) together said ends placed against each other.

7. A chain link (701) for jewelry and goldsmith's applications, comprising:

- a central body having an outline (207) cut from a flat metal strap (101), said outline (207) having a main development direction (501) defining two ends (502, 503) of said outline (207), wherein said outline is bent along at least one bending line which is transversal to said main development direction (501), thus placing said two ends (502, 503) against each other to close said link (701),
- and further comprising at least two junction tines (602, 603) facing outwards from said link (701), each one of said at least two junction tines (602, 603) being situated at a respective one of said two ends (502, 503), **characterized in that:**

said junction tines (602, 603) are formed in said flat metal strap (101), having directions that are transversal to said main development direction (501), wherein said at least two junction tines are further bent (301, 302) on respective bending planes which are transversal to said at least one bending line along which said outline was bent (303, 304).

8. A link according to claim 7, wherein said junction
tines (602, 603) comprise a sheared portion obtained
from opposite edges of said outline with respect to
said main development direction (501). 5
9. A link according to claim 7 or 8, wherein said link
(601, 701) comprises at least one central recess
(605, 606) that reduces the height thereof, and
wherein the distance between said junction tines
(602, 603) is equal to or greater than said height of 10
said link at said at least one central recess (605, 606).
10. A link according to claim 9, wherein said junction
tines (602, 603) and said at least one central recess
(605, 606) are adapted to be coupled between ad- 15
jacent links (801) for creating a chain.
11. A link according to claim 10, wherein said junction
tines (602, 603) are adapted to be bent around said
adjacent link (601) until they are placed against each 20
other, being preferably welded together (1001) head
to head.
12. A link according to any one of claims 7 to 11, com-
prising at least four of said transversal bending lines, 25
wherein said central body has a substantially box-
like shape, its cross-section being preferably circular
or polygonal, with or without smoothed corners.
13. A link according to claim 12, further comprising a 30
plurality of prongs (604) adapted to hold at least one
gem within said central body, said prongs (604) be-
ing located on at least one support surface formed
on at least one edge of said outline (207) other than
said ends (502, 503). 35
14. **A chain for jewelry and goldsmith's applications,**
comprising a plurality of links (801) according to any
one of claims 9 to 13. 40
15. **A device for making chain links for jewelry and
goldsmith's applications,** comprising means con-
figured for producing links according to the method
of any one of claims 1 to 6. 45

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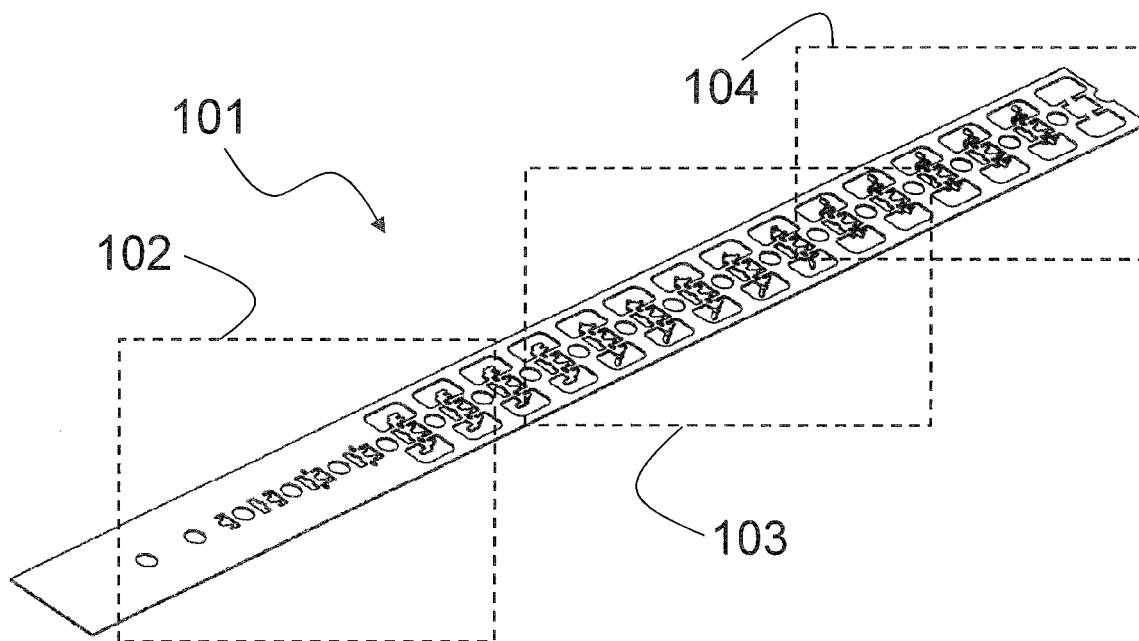


FIG. 1

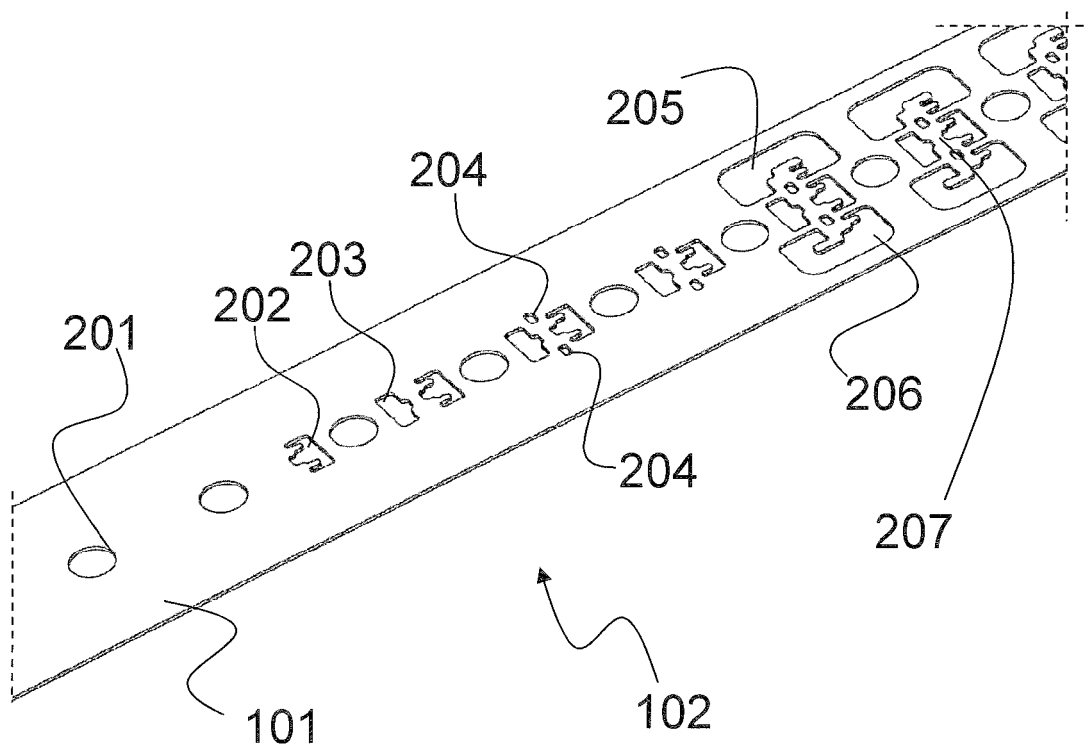


FIG. 2

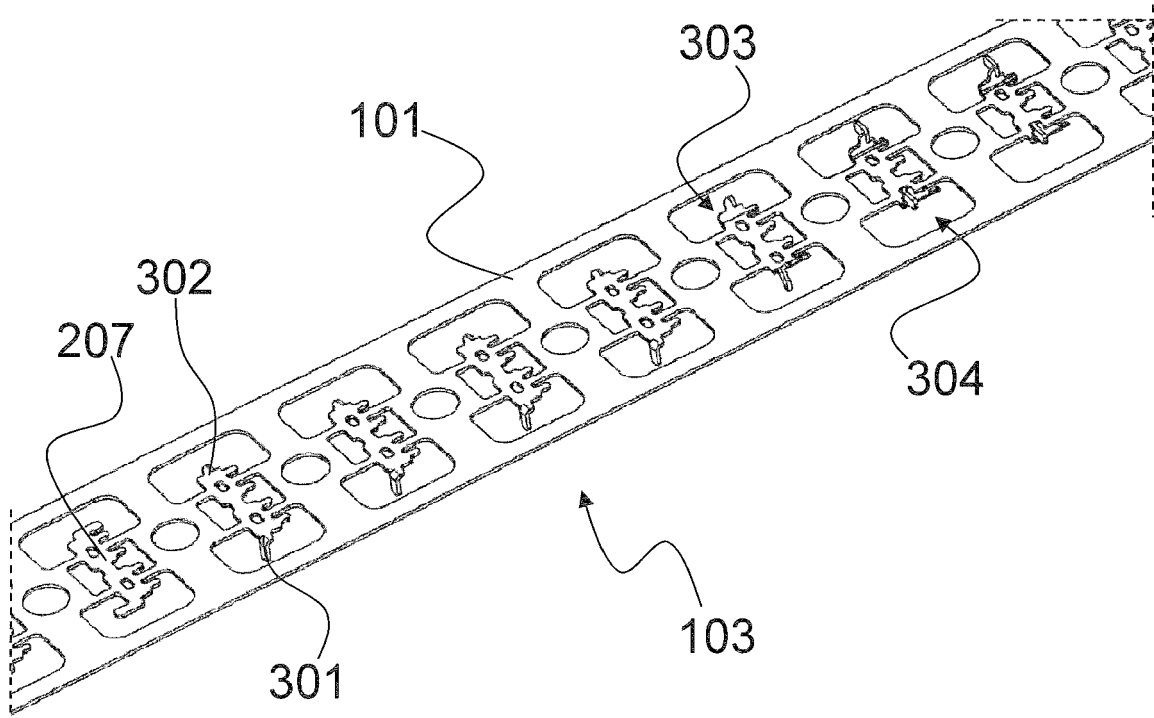


FIG. 3

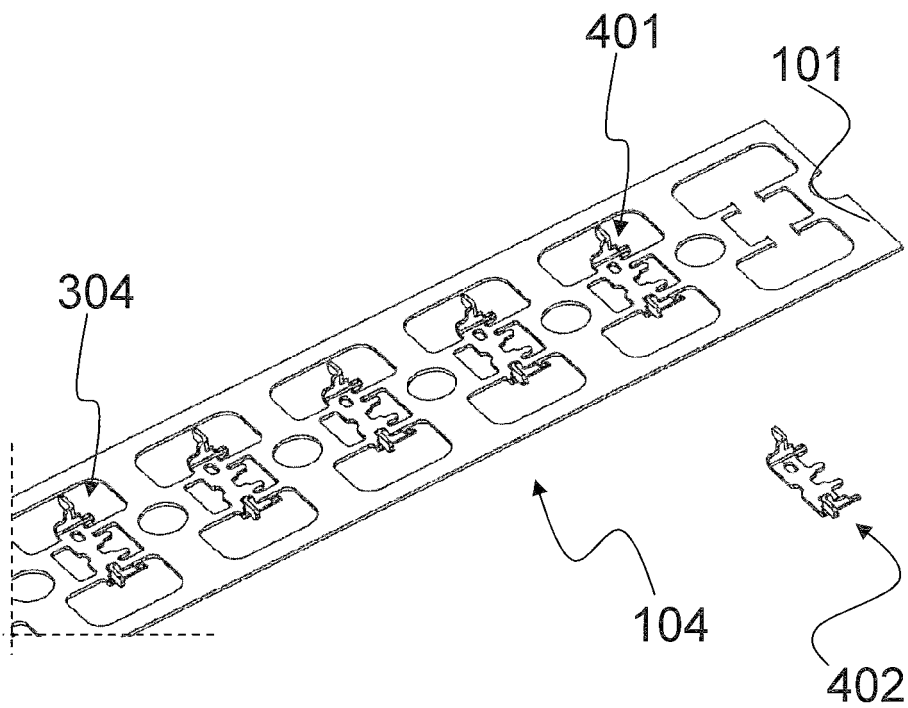
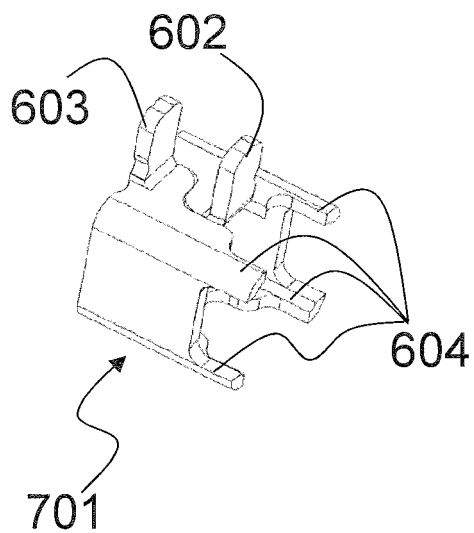
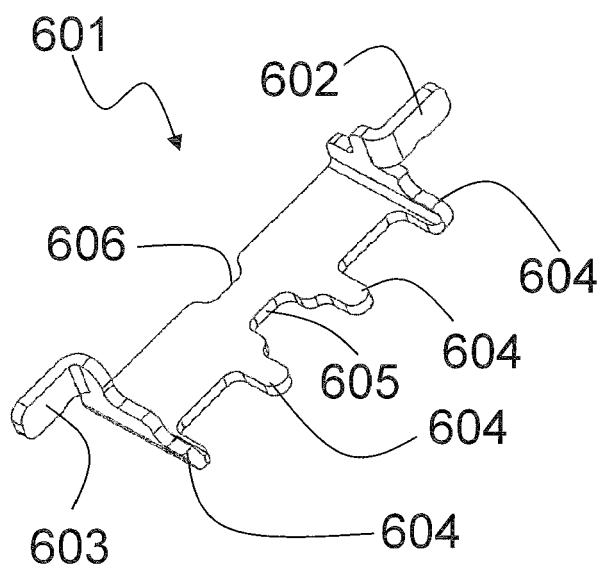
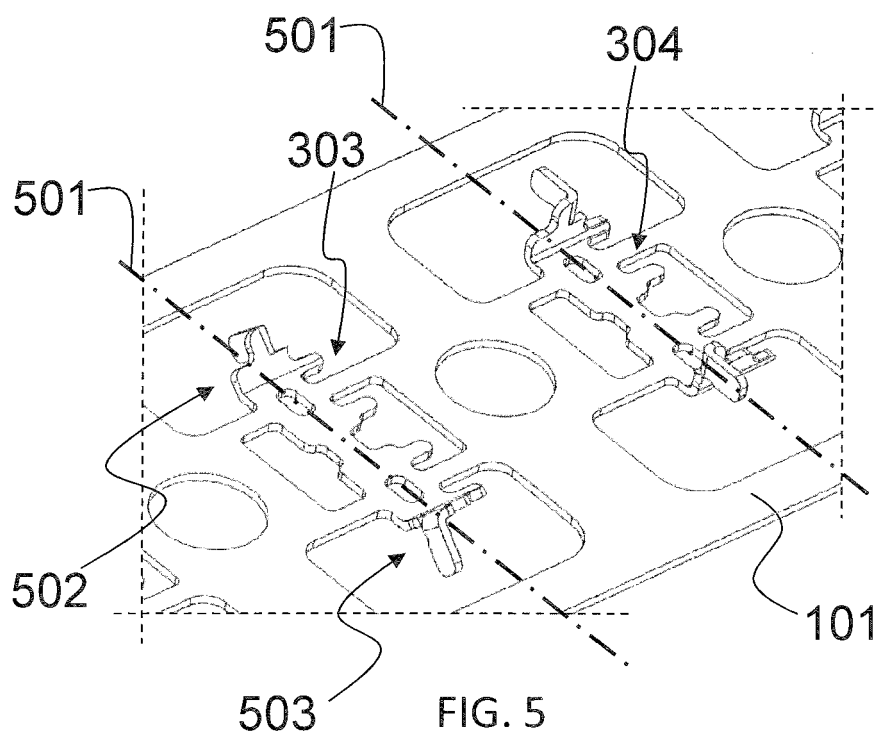


FIG. 4



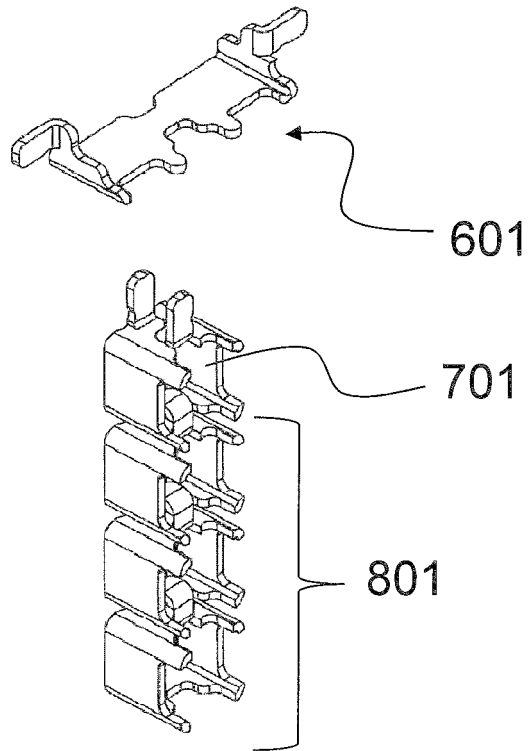


FIG. 8

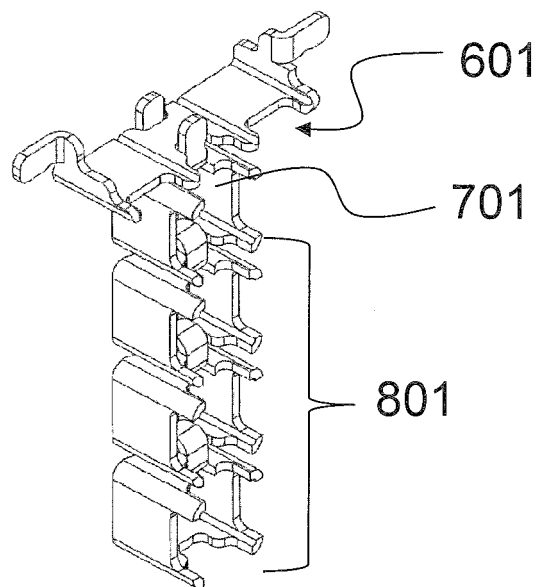


FIG. 9

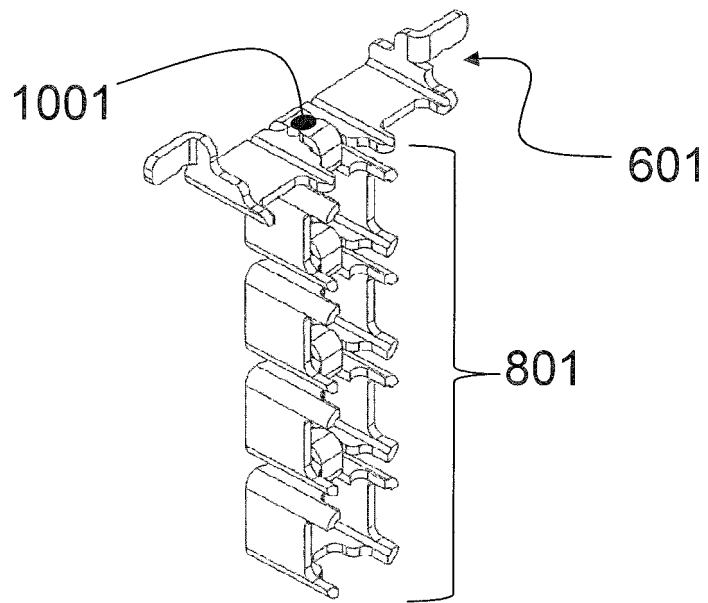


FIG. 10

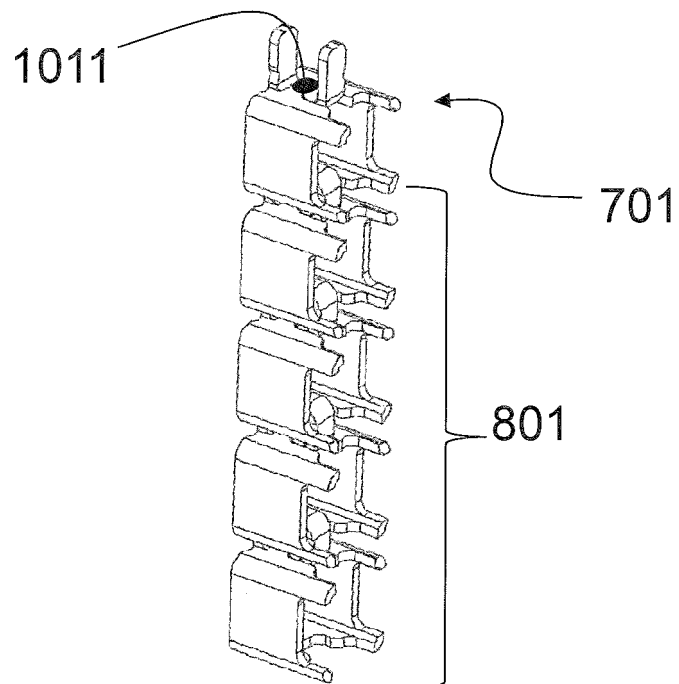


FIG. 11



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 3354

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2011/086514 A2 (OMBI S R L [IT]; PASTERIS MAURO [IT]; MONTANARO FILOMENO [IT]) 21 July 2011 (2011-07-21) * figures 2a, 2b, 3a, 3b * * page 7, line 25 - line 28 *	1-15	INV. A44C5/10 B21L11/00 A44C11/00
A	US 4 781 038 A (BRANCA ROBERT G [US] ET AL) 1 November 1988 (1988-11-01) * abstract; figures *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A44C B21L
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 September 2014	Examiner Krüger, Sophia
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09-09-2014

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WO 2011086514 A2	21-07-2011	NONE	
US 4781038 A	01-11-1988	NONE	

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