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(54) **A MODULAR ELEMENT FOR THE PRODUCTION OF CHAINS**

MODULARES ELEMENT ZUR HERSTELLUNG VON KETTEN

UN ÉLÉMENT MODULAIRE POUR LA PRODUCTION DE CHAINES

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Description

Field of application

[0001] The present invention is generally applicable to the jewellery and costume jewellery field and refers to chains or costume jewellery accessories such as bracelets, necklaces, earrings or the like.

[0002] In particular, the present invention refers to a modular element used for the composition of the above mentioned chains with particular, but not exclusive, reference to the so called "tennis" chain type.

Background Art

[0003] In the state of the art jewellery items such as bracelets, chains, rings, earrings or others created by joining together in series a number of modular elements are known.

[0004] A particular type of such items is called "tennis", and is made up of elements characterized by a box-shaped body provided with a setting to hold precious stones or the like.

[0005] The box-shaped elements concatenation in series is currently made in various ways.

[0006] In some cases the box-shaped elements are provided with a passing channel to insert them into a filament which creates the junction in series. Such solution, although practical, allows poor aesthetic results since the resulting concatenation is irregular. The modular elements, as a matter of fact, have a high degree of freedom of movement with respect to each other. Furthermore, although close to each other, the flexibility of the chain entails that the filament is often in sight. Moreover, the filament breaking may entail the complete unravelling of the concatenation with the risk of losing the modular elements.

[0007] Therefore various embodiments of the modular elements concatenated with each other in different ways are known. However all these embodiments are characterized by the fact that they are obtained by machining. In particular, the box-shaped element is typically obtained by cutting a flat body according to a specific shape which, when folded, allows to obtain the box-shaped body.

[0008] The junction between one element and the next one of the concatenation is carried out by coupling a flat body (still open modular element) to a box-shaped body (already folded modular element).

[0009] In this way, regular and aesthetically well-finished concatenations are obtained. Furthermore, the junction breaking between two successive modular elements does not entail the complete dissolution of the concatenation.

[0010] However, said machining cost is typically high since the machines used are complex and expensive. The hourly machining cost is also high and is amortized by creating particularly long concatenations. However,

this does not allow machining for a few jewellery items. In other words, such type of production is advantageously applicable only for a large number of jewellery items, not for samples or similar.

[0011] In such cases, therefore, the manual making of the modular elements and their concatenation is then performed.

[0012] Typically, modular elements are obtained with the lost wax microcasting technique and are concatenated with each other using filament segments emerging from an element, and which invest a through hole obtained in the next element. The filament is then manually folded and welded.

[0013] It is clear that the narrower the filament folding is, the more uniform the aesthetic appearance of the chain is. However, the folding may not be too tight since it must allow a good degree of freedom of movement between the individual modular elements in order to allow the making of bracelets, necklaces or other.

[0014] Since the making is manual, it is clear that the concatenation quality is therefore entrusted to the skill of the person who makes it. In any case, it always results as irregular with serious effects on the aesthetics of the finished product. Document US 5 592 835 discloses a modular element according to the preamble of claim 1.

Presentation of the invention

[0015] The object of the present invention is to overcome at least partially the above mentioned drawbacks by providing a modular element for the production of chains such as necklaces, bracelets, earrings and the like which allows the manual making of the concatenation.

[0016] Another object is that the modular element of the invention can also be made by means of the lost wax microcasting technique.

[0017] A further object of the present invention is that the modular element is moulded in such a way that the concatenation between elements made manually allows to obtain a chain which is in any case uniform regardless of the capability of the user making it.

[0018] In other words, an object of the present invention is to provide a modular element whose moulding facilitates manual concatenation so that the obtained item is more aesthetically pleasing and regular with respect to equivalent items of the known art obtained with manual techniques.

[0019] Another object is that the obtained item has an aesthetic quality comparable to known equivalent items obtained by means of machining.

[0020] At the same time, a further object is that the obtained item has lower making costs than those of known equivalent items obtained by means of machining.

[0021] Said objects, as well as others which will become clearer below, are achieved by a modular element for the production of chains such as necklaces, bracelets, earrings and the like according to the following claims

which are to be considered integral part of the present patent.

[0022] In particular, the modular element comprises a body, typically but not necessarily box-shaped, having a head end and a tail end moulded for stable coupling to further respective modular elements so as to create a chain.

[0023] According to an aspect of the invention, the shaped body comprises at least a pair of openings connected to a channel within the body itself which connects them. In particular, the openings are spaced with a partition and created on the lateral surface of the shaped body at least at the tail end.

[0024] There are also at least a pair of jaws connected to the head end and shaped to fit at least partially into the inner channel.

[0025] Each of the jaws, moreover, is moulded to fit into a respective opening.

[0026] According to another aspect of the invention, at least one of the jaws emerges from the plan projection of the shaped body lateral surface at least in a step before stable coupling of the modular element with another modular element.

[0027] In this way, advantageously, it is possible to manually assembly the chain. As a matter fact, in case of manual assembly of the chain, i.e. manual concatenation of the modular elements, it is possible to act on at least one of the jaws pushing it towards the other to obtain the joining of the two free ends within the channel. The stable junction between the two modular elements is thus obtained.

[0028] Still advantageously, the push acting on the jaws is outside the shaped body and does not affect it since, as said, the jaws protrude from the plan projection in the plan view of such shaped body. As a result, it is advantageously avoided that the tool used for such push contacts the shaped body and damages it. Such contact can be carried out when the junction is almost done, but it is clear that contact time and extent are such as to limit any damage to a minimum.

[0029] According to an aspect of the invention, however, at least one of the jaws typically, but not necessarily, protrudes from the aforesaid plan projection even when the free ends junction is done. In this case, advantageously, the contact between the tool and the shaped body is completely avoided.

[0030] Still advantageously, the manual assembly possibility allows to reduce the production costs and to make, therefore, even small samples.

[0031] The assembly is still precise and allows to avoid damage to the box-shaped body thus guaranteeing a quality similar to the equivalent items created with specific machines.

[0032] The closure type, however (two jaws that are tightened up to contact) advantageously guarantees a regular junction regardless of the capability of the user who assembles the chain.

[0033] Still advantageously, the modular element can

be made using the lost wax microcasting technique with further savings in production costs.

Brief description of the drawings

[0034] Further features and advantages of the invention will be clearer in light of the detailed description of a preferred, but not exclusive, embodiment of a modular element for the production of chains such as necklaces, bracelets, earrings and the like according to the invention, illustrated as a non-limiting example with the assistance of the accompanying drawings tables wherein:

- FIG. 1 shows an axonometric view of a modular element according to the invention;
- FIG. 2 shows a pair of modular elements according to FIG. 1 combined for concatenation.
- FIGS. 3 to 5 show operative moments of a modular elements concatenation according to FIG. 1.

Detailed description of some preferred embodiment example

[0035] With reference to the mentioned figures, and in particular to FIGS. 1 and 2, a modular element **1** is disclosed for the production of chains such as necklaces, bracelets, earrings and the like. Such modular element **1** is typically used to create chains of the so called "tennis" type.

[0036] In this sense, the modular element **1** comprises a shaped body **2** in which a head end **3** and a tail end **4** can be identified which are moulded by stable coupling to further respective modular elements **1** so as to create a chain. In other words, the two ends **3** and **4** of the shaped body **2** are moulded to directly allow a concatenation without additional elements.

[0037] According to an aspect of the invention, such shaped body **2** comprises a pair of openings **6** created on the lateral surface **8** of the shaped body **2** at the tail end **4**. They are also connected to a channel **9** created within the shaped body **2** itself. Channel **9**, in particular, serves as connection between the two openings **6**.

[0038] In more details in the disclosed embodiment, the shaped body **2** is a box-shaped body comprising a base plate **10** and an upper plate **11** separated by a pair of partitions **12**. In other words, in the disclosed embodiment, channel **9** is formed by the whole area between the two plates **10** and **11** with the openings **6** separated by one of the partitions **12**.

[0039] On the upper portion **13** of the shaped body **2** there is also a setting **14** for holding precious stones or the like.

[0040] These last details of the box-shaped body **2** must not be considered as limiting for the invention anyway. In particular, the openings and the channel can be obtained from a solid or with other processes than the superposition of two plates separated by partitions. Moreover, even when using plates, also the number of parti-

tions must not be considered as a limiting feature of the present invention.

[0041] Also the presence of the setting must not be considered as a limiting feature of the invention. As a matter of fact, according to different embodiments of the invention, the upper portion of the shaped body can be associated with further embellishment elements by means of adhesives, welding or precision castings. According to other embodiments of the invention, further embellishment elements are absent and the upper portion of the shaped body, perhaps decorated with incisions or the like, is left exposed.

[0042] According to a further aspect of the invention, the modular element **1** also comprises a pair of jaws **15** connected to the head end **3** and shaped to be inserted in the inner channel **9** each through a respective opening **6**. In particular, they have a shape such as to embrace the partition **12** at the tail end **4** when their free ends **16** are pushed against one another. In this way, the concatenation of two subsequent modular elements **1** is obtained.

[0043] Advantageously, therefore, the modular element **1** can be made without the use of specific machines and, for example, with the lost wax microcasting technology. As a matter of fact, it does not need to be obtained by cutting subsequently folded plates. This means a significant saving in terms of production costs and also enables to make limited sampling.

[0044] The concatenation, moreover, is simple since pushing the jaws **15** against each other is sufficient to obtain it, thereby making sure the result is obtained regardless of the operator's capabilities.

[0045] Previously it has been stated that is in any case important to protect the shaped body **2** from possible damage during the concatenation of the modular elements **1**. For this purpose, the jaws **15** are shaped so as to emerge from the plan projection of the shaped body **2** lateral surface **8** at least initially.

[0046] Advantageously, therefore, it is possible to push a jaw **15** towards the other with manual tools assistance such as grippers or the like acting from outside the shaped body **2** without involving it.

[0047] According to the disclosed embodiment, the two jaws **15** are substantially L-shaped, but also such detail must not be considered as limiting of the invention. Moreover, the two jaws can have any shape, even different from one another. The protrusion of both of them from the plan lateral surface of the shaped body is also not a limitative feature of the invention. As a matter of fact, the important aspect is that at least in the initial state, that is at least before closure, one protrudes so as to allow it to be pushed towards the other acting from outside the shaped body and without damaging it. As a result, the second jaw could also be straight.

[0048] In fig. 3 a concatenation is observed between a plurality of modular elements **1** before the closure of the jaws **15** which, as can be seen, protrude from the concatenation profile.

[0049] By acting on each pair of jaws **15** by means of grippers or the like, they are pushed against each other, closing the concatenation obtaining the result that can be seen in fig. 4.

5 [0050] In fig. 5 it is observed that even after such operation the jaws **15** still project from the shaped bodies **2** plan projection. Such detail, although is not to be considered as limiting of the invention, is advantageous since the integrity of the shaped body **2** is ensured even at the closure of the jaws **15**. At the end of the concatenation remove the remaining projection will be sufficient to obtain a perfect result.

10 [0051] Still with reference to the jaws **15**, in the figures it is observed that they are stably coupled to the partition **12** at the head end **3** as well as at the two plates **10** and **11**. However, also such executive detail must not be considered as limiting of the invention.

15 [0052] According to another aspect of the invention, portions **20** of the free ends **16** of the jaws **15** have a rounded outer surface. In particular, in the embodiment that is described, the base portion of the L. is rounded. Since the concatenation of the modular elements **1** should be laterally rigid, but longitudinally well flexible in order to use it in particular for bracelets and necklaces, the rounded shape of the L base allows to minimize the friction between subsequent modular elements **1** when flexed with respect to each other in the longitudinal direction of the concatenation.

20 [0053] In light of the foregoing, it is understood that the modular element of the invention achieves the intended purposes.

25 [0054] In particular, it allows the manual making of the concatenation, with subsequent welding, for example by laser, flame or pulses, and its making by means of the lost wax microcasting technique.

30 [0055] It is also moulded in such a way that the concatenation between elements made manually allows to obtain a uniform chain in any case regardless of the capacity of the user who makes it at the same time preserving the aesthetic quality of the modular elements themselves.

35 [0056] In particular, the aesthetic quality of the chain obtained with the modular element of the invention is comparable to that of equivalent chains obtained by means of machining, but at the same time the costs are lower.

40 [0057] The invention might be subject to many changes and variants, which are all included in the appended claims. Moreover, all the details may furthermore be replaced by other technically equivalent elements, and the materials may be different depending on the needs, without departing from the protection scope of the invention defined by the appended claims.

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Claims

1. Modular element for the production of chains such

as necklaces, bracelets, earrings and the like comprising a shaped body (2) having a head end (3) and a tail end (4) moulded for the stable coupling to further modular elements (1) so as to make a chain, said shaped body (2) comprising:

- at least a pair of openings (6) connected to an inner channel (9) within said shaped body (2) which connects them, said openings (6) being spaced with one or more partitions (12) and made on the lateral surface (8) of said shaped body (2) at least at said tail end (4); **characterized in that:**

- at least a pair of jaws (15) is connected to said head end (3) and shaped to fit at least partially into said inner channel (9), each of said jaws (15) being inserted into a respective one of said openings (6), at least one of said jaws (15) emerging from the lateral surface (9) plan projection of said shaped body (2) at least in a step before the stable coupling of said modular element (1) with another modular element (1) so as to push at least one of said jaws (15) towards the other of said jaws (15) acting from outside said shaped body (1) in order to connect the free ends (16) of said jaws (15) with each other when inserted in said inner channel (9) of another of said modular elements (1).

2. Modular element according to claim 1, wherein at least one of said jaws (15) has at least one portion (20) of a free end (16) having a rounded outer surface.
3. Modular element according to claim 1 or 2, wherein at least one of said jaws (2) is substantially L-shaped.
4. Modular element according to any one of the preceding claims, wherein at least one of said jaws (15) emerges from the lateral surface (9) plan projection of said shaped body (2) when the free ends (16) of said jaws (15) are in contact with each other.
5. Modular element according to any one of the preceding claims, wherein said modular element (1) is obtained by means of wax-wound microfusion technique.
6. Modular element according to any one of the preceding claims, wherein said shaped body (2) is a box-shaped body comprising a base plate (10) and an upper plate (11) separated by at least a pair of said partitions (12).
7. Modular element according to claim 6, wherein said jaws (15) are stably coupled to at least one of said

partitions (12).

8. Modular element according to claim 6 or 7, wherein said jaws (15) are shaped to embrace at least one of said partitions (12) when said free ends (16) are arranged in mutual contact.
9. Modular element according to any one of the preceding claims, wherein said shaped body (2) comprises, on its upper portion (13), a setting (14) for holding precious stones or the like.

Patentansprüche

1. Modulares Element für die Produktion von Ketten wie etwa Halsketten, Armbänder, Ohringe oder dergleichen, umfassend einen geformten Körper (2) mit einem Kopfende (3) und einem Schlussende (4), das für das stabile Verbinden mit weiteren modularen Elementen (1) ausgeformt ist, um so eine Kette herzustellen, wobei der geformte Körper (2) umfasst:

- mindestens ein Paar Öffnungen (6), die mit einem inneren Kanal (9) innerhalb des geformten Körpers (2) verbunden sind, der sie verbindet, wobei die Öffnungen (6) mit einem oder mehreren Abschnitten (12) beabstandet und auf der lateralen Oberfläche (8) des geformten Körpers (2) mindestens an dem Schlussende (4) hergestellt sind; **dadurch gekennzeichnet, dass:**

- mindestens ein Paar Backen (15) mit dem Kopfende (3) verbunden und geformt ist, um zumindest teilweise in den inneren Kanal (9) zu passen, wobei jede der Backen (15) in eine jeweilige der Öffnungen (6) eingesetzt wird, wobei zumindest eine der Backen (15) aus der ebenen Projektion der Seitenfläche (9) des geformten Körpers (2) zumindest in einem Schritt austritt vor der stabilen Verbindung des modularen Elements (1) mit einem weiteren modularen Element (1), um wenigstens eine der Backen (15) gegen die andere der Backen (15) zu drücken, die von außerhalb des geformten Körpers (1) wirken, um die freien Enden (16) der Backen (15) miteinander zu verbinden, wenn sie in den inneren Kanal (9) eines anderen der modularen Elemente (1) eingesetzt sind.

2. Modulares Element nach Anspruch 1, wobei mindestens eine der Backen (15) mindestens einen Abschnitt (20) eines freien Endes (16) mit einer abgerundeten Außenfläche aufweist.
3. Modulares Element nach Anspruch 1 oder 2, wobei mindestens eine der Backen (2) im Wesentlichen L-förmig ist.

4. Modulares Element nach einem der vorhergehenden Ansprüche, wobei mindestens eine der Backen (15) aus der Planprojektion der Seitenfläche (9) des geformten Körpers (2) austritt, wenn die freien Enden (16) der Backen (15) miteinander in Kontakt stehen. 5
5. Modulares Element nach einem der vorhergehenden Ansprüche, wobei das modulare Element (1) mittels wachsgewickelter Mikrofusionstechnik erhalten wird. 10
6. Modulares Element nach einem der vorhergehenden Ansprüche, wobei der geformte Körper (2) ein kastenförmiger Körper ist, der eine Bodenplatte (10) und eine obere Platte (11), die durch mindestens ein Paar der Trennwände (12) getrennt ist, umfasst. 15
7. Modulares Element nach Anspruch 6, wobei die Backen (15) stabil mit mindestens einer der Trennwände (12) gekoppelt sind. 20
8. Modulares Element nach Anspruch 6 oder 7, wobei die Backen (15) geformt sind, um mindestens eine der Trennwände (12) zu umschließen, wenn die freien Enden (16) in gegenseitigem Kontakt angeordnet sind. 25
9. Modulares Element nach einem der vorhergehenden Ansprüche, wobei der geformte Körper (2) an seinem oberen Abschnitt (13) eine Fassung (14) zum Halten von Edelsteinen oder dergleichen umfasst. 30

Revendications

1. Élément modulaire pour la production de chaînes telles que des colliers, des bracelets, des boucles d'oreilles et similaires comprenant un corps mis en forme (2) présentant une extrémité avant (3) et une extrémité arrière (4) moulées pour le couplage stable à des éléments modulaires (1) supplémentaires de façon à réaliser une chaîne, ledit corps mis en forme (2) comprenant : 40
 - au moins une paire d'ouvertures (6) raccordées à un canal interne (9) au sein dudit corps mis en forme (2) qui les raccorde, lesdites ouvertures (6) étant espacées avec un ou plusieurs éléments de partitionnement (12) et réalisées sur la surface latérale (8) dudit corps mis en forme (2) au moins au niveau de ladite extrémité arrière (4) ; **caractérisé en ce que** :
 - au moins une paire de mâchoires (15) est raccordée à ladite extrémité avant (3) et mise en forme pour s'adapter au moins partiellement dans ledit canal interne (9), chacune desdites 45

mâchoires (15) étant insérée dans une ouverture respective desdites ouvertures (6), au moins l'une desdites mâchoires (15) émergeant de la projection en plan de surface latérale (9) dudit corps mis en forme (2) au moins dans une étape avant le couplage stable dudit élément modulaire (1) avec un autre élément modulaire (1) de façon à pousser au moins une desdites mâchoires (15) vers l'autre desdites mâchoires (15) agissant depuis l'extérieur dudit corps mis en forme (1) afin de raccorder les extrémités libres (16) desdites mâchoires (15) entre elles lorsqu'elles sont insérées dans ledit canal interne (9) d'un autre desdits éléments modulaires (1).

2. Élément modulaire selon la revendication 1, dans lequel au moins l'une desdites mâchoires (15) présente au moins une partie (20) d'une extrémité libre (16) présentant une surface externe arrondie.
3. Élément modulaire selon la revendication 1 ou 2, dans lequel au moins une desdites mâchoires (2) est sensiblement en forme de L.
4. Élément modulaire selon l'une quelconque des revendications précédentes, dans lequel au moins l'une desdites mâchoires (15) émerge de la projection en plan de surface latérale (9) dudit corps mis en forme (2) lorsque les extrémités libres (16) desdites mâchoires (15) sont en contact entre elles.
5. Élément modulaire selon l'une quelconque des revendications précédentes, dans lequel ledit élément modulaire (1) est obtenu au moyen d'une technique de microfusion à la cire. 35
6. Élément modulaire selon l'une quelconque des revendications précédentes, dans lequel ledit corps mis en forme (2) est un corps en forme de boîte comprenant une plaque de base (10) et une plaque supérieure (11) séparées par au moins une paire desdits éléments de partitionnement (12).
7. Élément modulaire selon la revendication 6, dans lequel lesdites mâchoires (15) couplées de manière stable à au moins l'un desdits éléments de partitionnement (12).
8. Élément modulaire selon la revendication 6 ou 7, dans lequel lesdites mâchoires (15) sont mises en forme pour accueillir au moins l'un desdits éléments de partitionnement (12) lorsque lesdites extrémités libres (16) sont agencées en contact réciproque.
9. Élément modulaire selon l'une quelconque des revendications précédentes, dans lequel ledit corps mis en forme (2) comprend, sur sa partie supérieure (13), un enchâssement (14) pour maintenir des pier-

res précieuses ou similaires.

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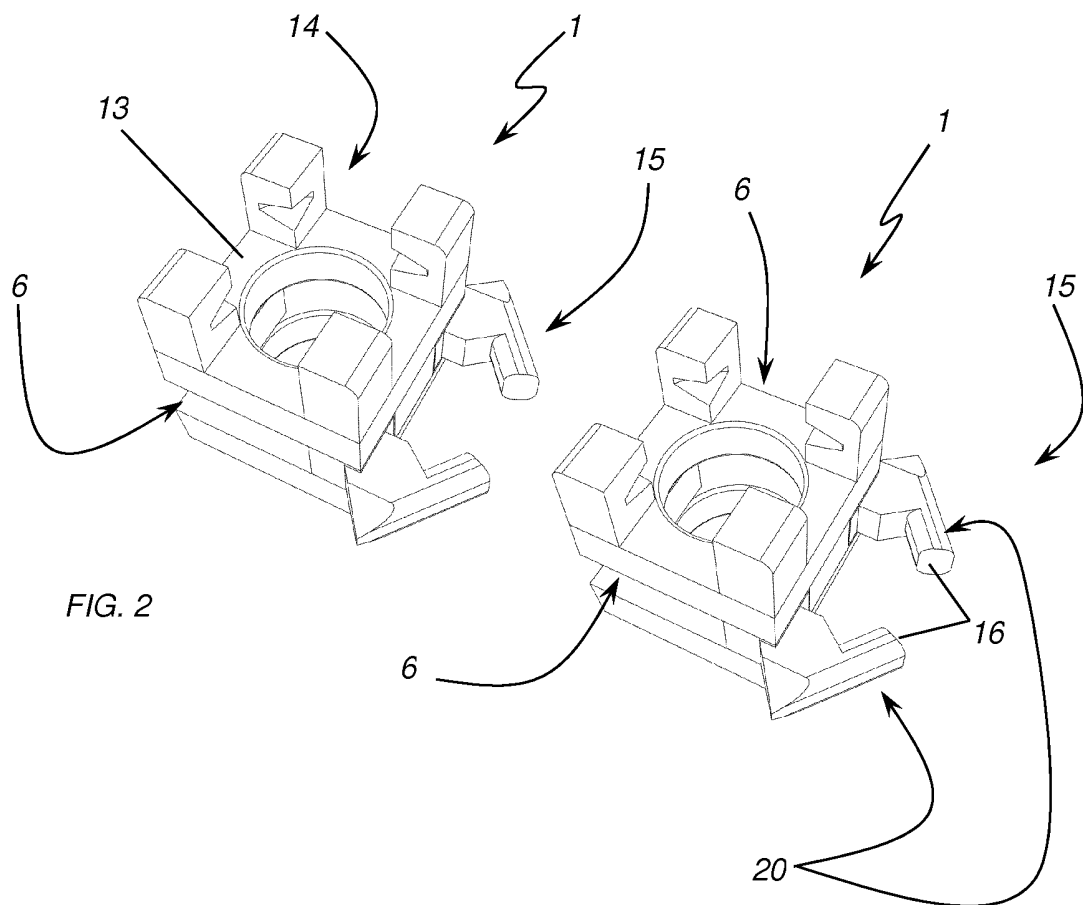
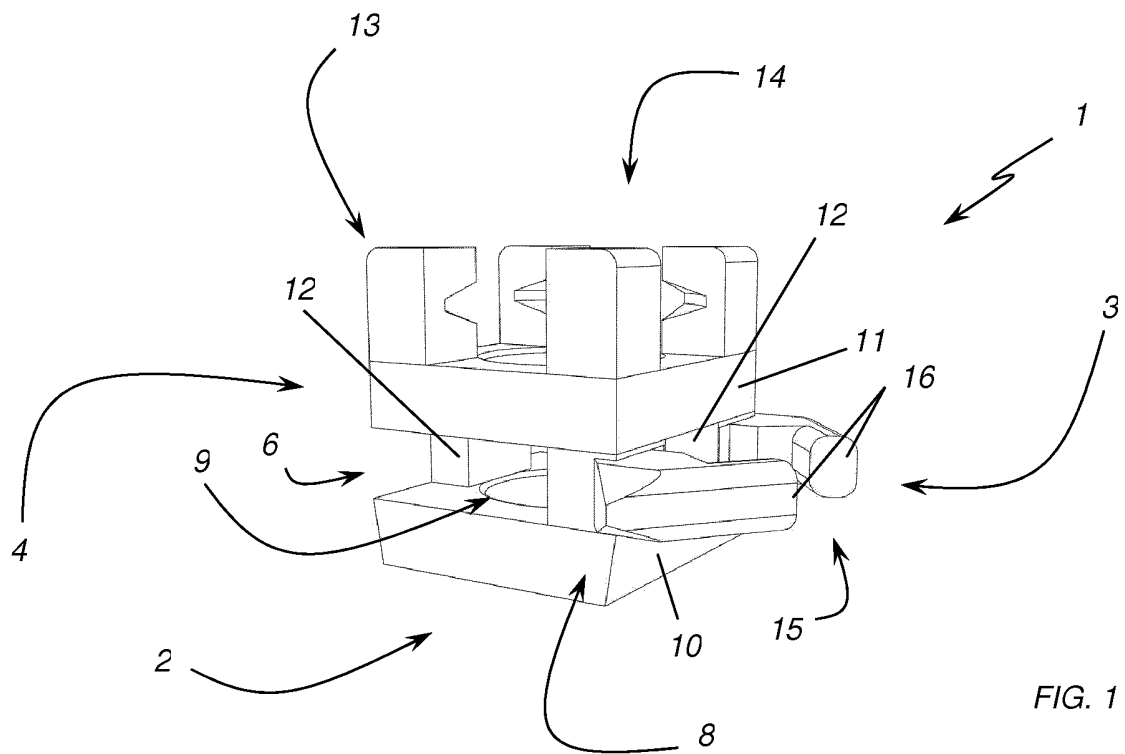
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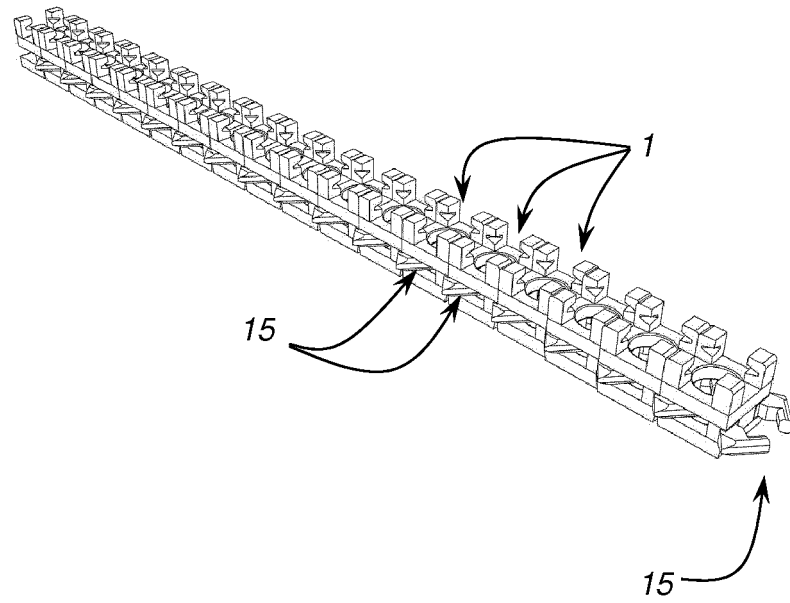


FIG. 3

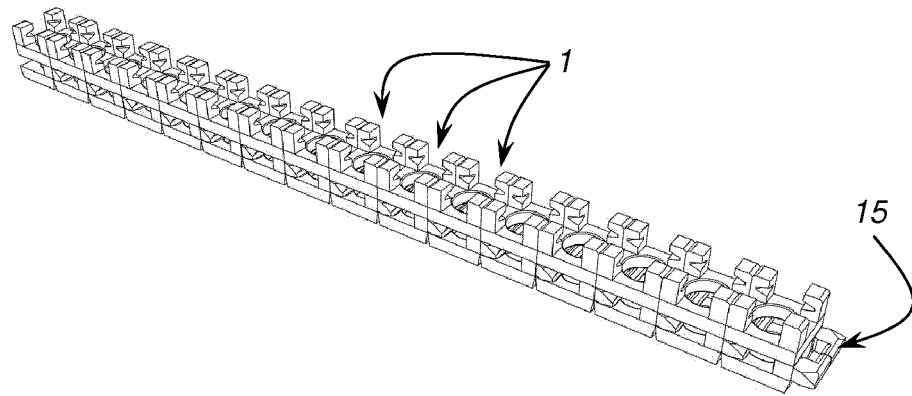


FIG. 4

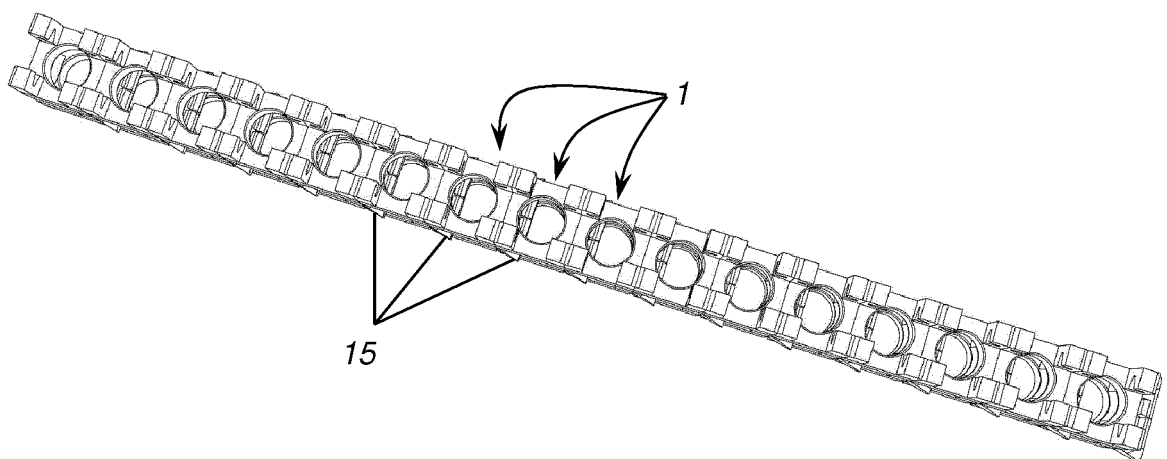


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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