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Description

[0001] The present invention relates to a security seal and to a process for its manufacturing.

BACKGROUND OF THE INVENTION

[0002] Security seals comprising an elongated and flexible strip that is locked on itself in a loop-like way, by passing one of its ends into a housing that is conformed at the other end, are known. The strip is held at its locked position by means of a catch mechanism that blocks the movement of said strip in an opening direction, so that the seal cannot open again once the strip free end has been introduced into the housing conformed at the other end.

[0003] This kind of devices allows for partially guaranteeing the inviolability of the content of a sealed article or product.

[0004] However, it has been proved that this kind of seals can be opened without having to break them, so that there is no evidence that said seals have been forced open. The catch or lock mechanism of said seals consists of some teeth present on the passage conformed in one of the ends of the strip that engage to some grooves made alongside said strip, allowing its introduction in one direction but blocking its extraction in the opposite direction. Said mechanism, as well as the totality of the seal, is made of plastic, so that by applying heat to its locking area it is possible to achieve that the insertion passage of the strip expands sufficiently to remove said strip without causing material damage, being able to lock the seal again without leaving evidence of its forced opening.

[0005] In order to overcome this problem, the document WO 2006/013216 A1 discloses a seal that comprises a box or intermediate piece, which is inserted and attached into a housing that is present in one of the ends of the strip. Said intermediate piece comprises a through-hole that is aligned with a passage formed in the housing. Then, the other end of the strip is passed through said passage and said hole to lock the seal. The intermediate piece comprises a metal plate or framework arranged inside, that also comprises a hole for the passage of the strip and some teeth that are intended to engage the grooves that are formed alongside the entire strip, in order to lock said strip in its locking position. Thanks to those teeth of the metal plate, it is not possible to obtain a deformation sufficient to remove the strip by applying heat, since the heat necessary to expand the metal of the framework would completely destroy the plastic part of the seal.

[0006] However, this type of seal has the drawback that the intermediate piece or box and the housing are fixed together by means of a system that can prove vulnerable. Said fastening system consists of a box pin that engages a hole that passes through said housing. The pin is arranged outside the housing, so that someone could easily access and manipulate it using any tool to

remove the box from the housing, causing the seal to be more vulnerable.

[0007] It is also known from the state of the art the document US5123686 where a tamper-proof seal is described. The seal includes a housing having a strap engagement device and a strap coupled to the housing. The strap engagement device includes a locking member that lockingly engages the strap when it is inserted into the housing. The strap includes a pair of adjacent protuberances located near the housing so when the strap is tightened about a bag, the protuberances clench the bag material while providing a convenient slot in which a knife can be inserted. A loop member may be coupled to the housing including an opening through which the strap is inserted prior to inserting it within the housing.

[0008] In US5524945 a thermoplastic security seal is described. The seal has a locking socket body from which a flag extends on one side and a rectangular flat elongated shackle extends on the opposite side. The shackle has several locking circular segment teeth adjacent to a tamper resistant flange at the member end. A locking sheet metal stamped insert in a socket locking cavity aligned with shackle receiving openings in the body. The body receives the insert through a cavity side wall later sealed with a flap formed in the body. The locked shackle forms a closed loop passed through an aperture in the bag folded neck.

[0009] Also document EP0676736 is known. In said document it is described a seal made of a plastic strip fitted at one end with a thickening housing a metal plate fitted with an opening with a boundary slightly smaller than that of the area where the flexible strip is to be fixed and which through peripheral tabs leaning in the direction of introduction of the strip allow its passage in one direction at the same time that they prevent its withdrawal. The strip may be fitted with locking teeth or not, and is further fitted with a tab and weakening lines to facilitate its breakage, as well as grading marks to allow establishing how many times it has been reused.

DESCRIPTION OF THE INVENTION

[0010] The aim of the present invention is to overcome the drawbacks of the devices known in the art, by providing a seal that comprises a flexible strip, a body arranged at one end of said flexible strip, a housing arranged in said body, a piece that is arranged inside said housing, means for fixing the piece inside the housing, and a first hole passing through said housing and a second hole passing through said piece that are aligned when the piece is arranged inside the housing, so that the other end of the strip passes through said holes for locking said seal, the position of said strip being locked by means of locking means of the strip that are present in the piece, characterized in that said means for fixing the piece inside the housing comprise at least one welding area between the inner surface of the housing and the outer surface of the piece.

[0011] Thanks to these characteristics, the intermediate piece is attached inside the housing in a secure way, as the attachment between the housing and said intermediate piece is permanent and inaccessible from outside the seal.

[0012] Preferably, the at least one welding area is an area conformed by melting from the outer surface of said housing in correspondence with the position of the piece arranged inside said housing.

[0013] The formation of the welding area by means of the melting of the material of the housing and of the piece from the outer surface of said housing allows to carry out the attachment in a simple and quick way. Advantageously, the piece comprises at least a rough area in its outer surface in correspondence with at least one welding area between the inner surface of the housing and the outer surface of the piece.

[0014] Also advantageously, said at least one rough area comprises some ribs perpendicular to the direction of insertion of the piece into the housing.

[0015] The rough area of the surface of the intermediate piece allows a better welding of the same to the housing of the seal, as it provides a greater contact surface and a better interaction between the melted material of both elements.

[0016] According to the present invention, the piece comprises a framework arranged inside.

[0017] Also, the framework comprises a third hole aligned with the first and second holes when the piece is arranged inside the housing.

[0018] Advantageously, the locking means of the strip comprise teeth that are present on the walls of the third hole of the framework in cooperation with the outer surface of said strip.

[0019] Said framework made of a metal material, prevents the expansion of the retention teeth of the strip by applying heat in the event that someone pretends to force open the seal without leaving evidence of it. The framework makes it necessary to destroy the plastic part of the seal, thus leaving evidence of a possible forced opening thereof. Preferably, the seal comprises means for attaching the framework inside the piece.

[0020] Also, the means for attaching the framework inside the piece comprise coupling means between said framework and said piece. According to the invention, the coupling means comprise at least one inner edge of the piece which can be coupled to at least one edge of the framework.

[0021] Said coupling means between the framework and the piece prevent said framework from separating from said piece during the manufacturing process of the seal before the piece is fixed inside the housing, thus avoiding the production of defective seals and improving the efficiency of the process.

[0022] According to an embodiment of the present invention, the seal comprises a weakness area between the flexible strip and the body. This weakness allows to easily open the seal with the hands, without the need to

use a cutting tool.

[0023] Advantageously, the seal comprises at least one tip on a surface in contact with an object to be sealed. Said preferably tip-shaped tips, allow the seal to remain attached to the object to be sealed in a secure way, thus preventing said object from sliding and separating from the seal. Also advantageously, the seal comprises a hole in the body, situated adjacent to the housing. Said hole allows to arrange the hanging exceeding section of the flexible strip through it when the seal is closed, so that said seal occupies less space and is easier to handle. According to the present invention, the framework is made of metal. According to an embodiment of the present invention, the strip comprises a substantially rectangular cross section.

[0024] According to another embodiment of the present invention, the strip has a substantially circular cross section.

[0025] Preferably, the housing and the piece are made of the same material.

[0026] Also preferably, the housing and the piece are made of plastic material.

[0027] This composition facilitates the welding between the housing and the piece.

[0028] The plastic material will be preferably polypropylene or polyamide. In another aspect of the present invention, a manufacturing process of a seal that comprises a flexible strip, a body arranged at one end of said flexible strip, a housing arranged in said body and a piece that is arranged inside said housing, is provided, said manufacturing process being characterized in that it comprises the steps of:

- inserting the piece in the housing;
- providing at least one welding area where the inner surface of said housing and the outer surface of said piece are welded to each other.

[0029] Said process allows to obtain a quick and secure fastening between the housing and the intermediate piece of the seal, that is inaccessible from outside and that makes the extraction of said piece practically impossible. Preferably, the at least one welding area is made by applying heat from the outer surface of said housing.

[0030] Also preferably, the application of heat is carried out by means of a sonotrode device.

[0031] The application of heat to provide the welding area can be carried out quickly from outside the seal, by means of a standard welding device and without the incorporation of any additional fixing piece or element in said seal. Advantageously, the piece comprises at least one rough area in its outer surface in correspondence with the at least one welding area between the inner surface of the housing and the outer surface of the piece. Also advantageously, said at least one rough area comprises some ribs perpendicular to the direction of insertion of the piece into the housing.

[0032] According to the present invention, the process comprises the step of inserting a framework into the piece prior to the insertion of said piece into the housing.

[0033] The framework is secured inside the piece by means of means for attaching said framework to said piece. The means for attaching the framework to the piece comprise coupling means between said framework and said piece.

[0034] Also according to the invention, the coupling means comprise at least one inner edge of the piece that can be coupled to at least one edge of the framework.

[0035] Preferably, the framework is made of metal.

[0036] Also preferably, the housing and the piece are made of the same material.

[0037] Advantageously, the housing and the piece are made of plastic material.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] In order to facilitate the description of what was explained above, some drawings are attached which, schematically and by way of a non-limiting example, represent a practical case of embodiment of the invention, wherein :

Figure 1 is a perspective view of the top of a seal according to the present invention;

Figure 2 is a perspective view of the underside of the seal shown in Figure 1;

Figures 3 to 6 are perspective views showing in a detailed way the intermediate piece of the seal according to the present invention and the framework that is arranged inside it; Figures 7 to 9 are views in longitudinal section of the intermediate piece and of the framework showing the insertion of the latter into the first one;

Figure 10 is a perspective view showing the insertion of the intermediate piece into the housing of the seal according to the present invention;

Figure 11 is a perspective view of the seal according to the present invention with the intermediate piece inserted in the housing;

Figure 12 is a perspective view of the seal according to the present invention showing a step of the process for attaching the intermediate piece to the housing;

Figures 13 to 15 are cross sectional partial views of the union area between the intermediate piece and the housing showing the attachment process between both elements;

Figure 16 is a perspective view of the seal according

to the present invention with the intermediate piece attached to the housing;

Figure 17 is a view of the seal of Figure 16 in a locked position;

Figure 18 is a perspective view of the top of an alternative embodiment of the seal according to the present invention;

Figure 19 is a perspective view of the underside of the seal shown in Figure 18;

Figure 20 is a perspective view of the top of another alternative embodiment of the seal according to the present invention;

Figure 21 is a perspective view of the underside of the seal shown in Figure 20.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0039] In figures 1 and 2 a seal 1 according to the present invention can be seen. The seal 1, preferably made of plastic, and more preferably of polypropylene or polyamide, comprises a flat flexible strip 2 that has a plurality or grooves perpendicular to the longitudinal axis of said strip 2 and made on both sides of the same, in most of its length. The strip 2 is joined to a body 3 by one of its ends. Said body 3 can be used as a support for an identification label or chip. The body 3 comprises in its nearest end to the strip 2 a housing 4 integrally formed with the same. Said housing 4 comprises a front opening 5 that extends in the longitudinal direction of the seal 1 and a passage 6 that passes perpendicularly through said opening 5 and its lower and upper walls.

[0040] The function of the housing 4 is to house an intermediate piece 7, shown more in detail in figures 3 to 6, and whose characteristics are described below.

[0041] In the embodiment shown, the intermediate piece 7 comprises an essentially parallelepiped body, with one of its ends slightly narrowed in order to facilitate the insertion of said piece 7 into the housing 4. The intermediate piece 7 is made of the same plastic material as the rest of the seal 1, and comprises a rough area 8 conformed in the outer surface of its upper side, that in the present embodiment consists of some parallel ribs and whose function will be explained hereinafter.

[0042] As can be seen, the intermediate piece 7 also comprises a hole or passage 9 that crosses it transversally. Also, the piece 7 comprises a hollow 10 of rectangular section that extends longitudinally in its interior, parallel with respect to the lower and upper surfaces of said piece 7 and perpendicularly with respect to the hole 9, and intended to house a metal framework or plate 11 inside.

[0043] The metal plate 11 has a shape essentially matching that of said hollow 10, and comprises another

transverse hole or passage 12 and some teeth 13 conformed on the walls of said hole or passage 12. Furthermore, the plate 11 comprises a flange 14 in its perimeter.

[0044] The metal plate 11 is inserted in the hollow 10 of the piece 7 (figures 3 and 5), being arranged with its hole 12 aligned with respect to the hole 9 of the intermediate piece 7 (figures 4 and 6).

[0045] In figures 7 and 9 the insertion of the metal plate 11 into the hollow 10 of the piece 7 can be seen in further detail. The intermediate piece 7 has an inner edge 15 on one of the walls of the hollow 10. Said edge 15 is associated with a ramp 16 that facilitates that the flange 14 of the metal plate 11 slides on the same when said metal plate 11 is inserted in the hollow 10 (figure 8), until engaging the edge 15 (figure 9).

[0046] This coupling between the edge 15 of the hollow 10 of the piece 7 and the flange 14 of the metal plate 11 prevents said metal plate 11 from coming out of the hollow 10 during the manufacturing process of the seal 1, improving in this way the effectiveness and the security of the entire process.

[0047] Furthermore, it can be seen that the inner edge 15 of the piece 7 is arranged only on one of the walls of the hollow 10, so that the flange 14 of the metal plate 11 remains engaged to the same, said metal plate 11 always has to be inserted into said hollow 10 with the side comprising the flange 14 orientated towards the edge 15. In other words, it is necessary to place the metal plate 11 always with the same orientation, as otherwise the fastening to the piece 7 will be impossible. This is important, as the fact of placing the metal plate 11 the wrong way round could cause an incorrect operation of the teeth 13 for locking the strip 2.

[0048] Once the metal plate 11 is secured inside the intermediate piece 7, said piece 7 is inserted in the housing 4 through the opening 5 (figures 10 and 11), in the longitudinal direction of the seal 1. The intermediate piece 7 is arranged inside the housing 4 with its hole 9 aligned with respect to the hole 6 of said housing 4. In this way, the holes 6, 9 and 12 of the housing 4, of the piece 7 and of the plate 11, respectively, are aligned thus forming a passage that transversally crosses said elements.

[0049] As can be seen, the ribs of the rough area 8 of the intermediate piece 7 extend perpendicularly with respect to the insertion direction of said piece 7 in the housing 11.

[0050] Once the intermediate piece 7 is arranged inside the housing 4, as shown in figure 11, it is necessary to fix said piece 7 so that the same cannot be removed from the housing 4. In figures 12 to 15 the process of fixing both elements is described.

[0051] In order to carry out the fastening of the piece 7 to the housing 4 a process of application of heat and welding is used. In the present embodiment, thanks to the fact that the whole seal 1, and hence the housing 4 as well, are made of a thermoplastic plastic, for example, polypropylene or polyamide, it is possible to provide a

melting area in said housing 4 that allows to permanently deform said area.

[0052] Said application of heat can be carried out by means of a standard sonotrode device 17, whose operation is well known in the art. The sonotrode device 17 can comprise a head 18 that allows to melt an area of the housing 4 located in correspondence with the rough area 8 of the intermediate piece 7 arranged inside. The sonotrode device 14 acts on the outer surface of the housing 4, by making a recess 19 on said outer surface that is a corresponding welding area 20 in the inner surface of said housing 4. Said welding area 20, that matches the rough area 8 of the intermediate piece 7, produces a fusion between the material of the housing 4 and the piece 7, so that both elements are permanently joined.

[0053] The presence of the ribs of the rough area 8 improves the welding strength between the inner surface of the housing 4 and the outer surface of the piece 7, as it provides a greater contact surface and a greater interaction between both elements.

[0054] As explained above, the material of the intermediate piece 7 will be the same as the one for the housing 4, in order to obtain an optimal welding between them.

[0055] Preferably, the depth of the recess 19 will be between 1 and 1,2 mm, in order to ensure a correct welding between the housing 4 and the piece 7. Likewise, the head 18 of the sonotrode welding device 17 can present an edge knurled or raised surface that allows to check its wearing.

[0056] After carrying out the welding, the intermediate piece 7 is secured in a permanent and secure way inside the housing 4. Said fastening is inaccessible from outside the seal 1, so that the extraction of the piece 7 from the housing 4 is practically impossible.

[0057] In Figure 16 the seal 1 according to the present invention is shown ready to be used, in other words, with the intermediate piece 7 arranged inside the housing 4 and secured to the same. Making reference to Figure 17, it is possible to see the seal 1 in a locked position. The loose end of the strip 2 was passed through the passage formed by the aligned holes 6, 9 and 12. The teeth 13 present on the walls of the hole 12 of the metal plate 11 (see figures 3 and 5) engage the grooves or the outer surface of the strip 2, so that they allow the passage of said strip 2 in the insertion direction of the same (see arrow) but prevent its extraction in the opposite direction.

[0058] In figures 18 and 19 an alternative embodiment of the seal 1 of the present invention can be seen. As can be seen, the seal 1 comprises a series of additional elements that will be explained below.

[0059] Firstly, the recess 21 made on the outer surface of the housing 4, and that creates the welding area 20, has in this case a circular shape. The operation of said recess 21 and the way to make it are essentially the same as in the rectangular recess 19 shown in the previous embodiment. The circular recess 21 allows to obtain a more effective welding area 20 between the housing 4 and the piece 7.

[0060] The seal 1 also comprises a weakness slot 22 located between the body 3 and the strip 2. Said slot 22 consists of a fringe or a notch of reduced thickness that allows to tear the seal 1 when the same is locked, facilitating its opening. The seal 1 comprises a side flange 23 adjacent to the slot 22 that can be held with the fingers and that facilitates the breaking of the seal 1 when pulling the same.

[0061] Also, the seal 1 comprises a plurality of tips 24 on one of the sides that will be arranged in contact with an object to be sealed, for example a bag. Said tips 24 are used so that the seal 1, once closed, is well attached to the object to be sealed. The tips 24 will increase the friction between the seal 1 and the object surrounded by the same, thus avoiding any accidental separation in case the seal 1 slides from the object.

[0062] Finally, the seal 1 comprises a hole 25 arranged near the housing 4 and that passes through the body 3. Said hole 25 allows to arrange through it the exceeding section of the strip 2 that is loose when the seal 1 is closed (see figure 17). In this way, the seal 1 is installed in a more compact way on the object to be sealed, thus facilitating its manipulation and reducing the inconveniences that the loose end of the strip 2 could cause.

[0063] As can be seen, the seal 1 of the present embodiment already has the intermediate piece 7 inserted in the housing 4. Obviously, the characteristics described above with reference to the embodiment of figures 1 to 17 are also applicable to the embodiment disclosed in figures 18 and 19.

[0064] In figures 20 and 21 another alternative embodiment of the seal 1 of the present invention is shown. Similar to figures 1 and 2, figures 20 and 21 show the seal 1 before carrying out the welding between the intermediate piece 7 and the housing 4.

[0065] As can be seen, the seal 1 of the present embodiment comprises a strip 2 of circular cross section. The hole 6 of the housing 4 is also circular, allowing the passage of the strip 2 through it. The hole of the intermediate piece and the hole of the metal plate (not shown) will have a suitable shape adapted to the circular strip 2. Likewise, the teeth of the hole of the metal plate (not shown) will also be adapted to lock the circular strip 2. The operation of the seal 1 of the present embodiment is the same as the seal 1 with a rectangular strip 2 previously shown.

[0066] The configuration of the present embodiment allows to obtain a smaller and more flexible strip 2. As can be seen, the seal 1 of the present invention prevents its forced opening without leaving evidence of such an action. Thanks to the teeth 13 of the metal plate 11, it is not possible to expand the passage of insertion of the strip 2 and remove it without causing damage in the rest of the seal 1. Also, thanks to the disclosed fastening system between the intermediate piece 7 and the housing 4 of the seal 1, the extraction of said piece 7 without destroying the housing 4 or the same piece 7 is impossible, as said fastening is inaccessible from outside said

seal 1. The manufacturing process of the seal 1 is simple and quick, and makes unnecessary the addition or formation of additional fastener parts or elements for attaching the housing 4 and the intermediate piece 7.

Claims

1. Seal (1) comprising a flexible strip (2), a body (3) arranged at one end of said flexible strip (2), a housing (4) arranged in said body (3), an intermediate piece (7) that is arranged inside said housing (4), at least one welding area (20) that is formed between the inner surface of the housing (4) and the outer surface of the intermediate piece (7) for fixing the intermediate piece (7) inside the housing (4), and a first hole (6) through said housing (4) and a second hole (9) through said piece (7) that are aligned when the intermediate piece (7) is arranged inside the housing (4), so that the other end of the strip (2) passes through said holes (6, 9) for locking said seal (1), **characterized in that:**

- the intermediate piece (7) comprises a hollow (10), and
- the seal (1) comprises a framework (11) arranged inside the hollow (10) of the intermediate piece (7) and having a third hole (12) aligned with the first and second holes (6, 9) when the intermediate piece (7) is arranged inside the housing (4), and
- at least one inner edge (15) in the intermediate piece (7) in one of the walls of the hollow (10) conformed for coupling with at least one edge (14) of the perimeter of the framework (11).

2. Seal (1), according to claim 1, **characterized in that** the intermediate piece (7) comprise at least one rough area (8) on its outer surface in correspondence with the inner surface of the housing (4) at the at least one welding area (20).

3. Seal (1), according to claim 2, **characterized in that** said at least one rough area (8) comprise ribs perpendicular to the direction of insertion of the intermediate piece (7) into the housing (4).

4. Seal (1), according to claim 1, **characterized in that** the walls of the third hole (12) of the framework (11) comprise teeth (13) in cooperation with the outer surface of said strip (2) allowing the passage of said strip (2) in the insertion direction of the strip (2) in the third hole (12) and preventing its extraction in the opposite direction.

5. Seal (1), according to any of the previous claims, **characterized in that** it comprises area weakness slot (22) between the flexible strip (2) and the body

- (3).
6. Seal (1), according to any of the previous claims, **characterized in that** it comprises at least one tip (24) on a surface configured for being in contact with an object to be sealed. 5
7. Seal (1), according to any of the previous claims, **characterized in that** it comprises a hole (25) in the body (3), located adjacent to the housing (4). 10
8. Seal (1), according to any of the previous claims, **characterized in that** the framework (11) is of metal.
9. Seal, according to any of the previous claims, **characterized in that** the strip (2) comprises a substantially rectangular cross section. 15
10. Seal, according to any of claims 1 to 9, **characterized in that** the strip (2) comprises a substantially circular cross section. 20
11. Seal (1), according to any of the previous claims, **characterized in that** the housing (4) and the intermediate piece (7) are made of the same material. 25
12. Seal (1), according to any of the previous claims, **characterized in that** the housing (4) and the intermediate piece (7) are made of plastic material. 30
13. Process for manufacturing a seal (1) that comprises a flexible strip (2), a body (3) arranged at one end of said flexible strip (2), a housing (4) with a first hole (6) and which is arranged in said body (3), and an intermediate piece (7) having a hollow (10) and a second hole (9) through said piece (7) and that is arranged inside said housing (4) so the first hole (6) and the second hole (9) are aligned and the strip (2) passes through said holes (6, 9), **characterized in that** it comprises the steps of: 35
- inserting a framework (11) into the hollow (10) of the intermediate piece (7) and securing the framework (11) in the intermediate piece (7) coupling at least one inner edge (15) of one of the walls of the hollow (10) of the intermediate piece (7) with at least one edge (14) of the perimeter of the framework (11); 40
 - inserting the intermediate piece (7) into the housing (4); 50
 - forming at least one welding area (20) wherein the inner surface of said housing (4) and the outer surface of said intermediate piece (7) are welded to each other. 55
14. Process, according to claim 13, **characterized in that** the at least one welding area (20) is formed by applying heat from the outer surface of said housing

(4).

15. Process, according to claim 14, **characterized in that** the application of heat is carried out by means of a sonotrode device (14).
16. Process, according to any of claims 13 to 15, **characterized in that** the intermediate piece (7) comprises at least one rough area (8) on its outer surface in correspondence with the at least one welding area (20) between the inner surface of the housing (4) and the outer surface of the intermediate piece (7).
17. Process, according to claim 16, **characterized in that** said at least one rough area (8) comprises ribs perpendicular to the direction of insertion of the intermediate piece (7) into the housing (4).
18. Process, according to any of claims 13 to 17, **characterized in that** the framework (11) is of metal.
19. Process, according to any of claims 13 to 18, **characterized in that** the housing (4) and the intermediate piece (7) are made of the same material.
20. Process, according to claim 19, **characterized in that** the housing (4) and the intermediate piece (7) are made of plastic material.

Patentansprüche

1. Siegel (1), das einen flexiblen Streifen (2), einen an einem Ende des besagten flexiblen Streifens (2) angeordneten Körper (3), ein im besagten Körper (3) angeordnetes Gehäuse (4), ein im Innern des besagten Gehäuses (4) angeordnetes Zwischenstück (7), mindestens einen zwischen der Innenfläche des Gehäuses (4) und der Außenfläche des Zwischenstücks (7) gebildeten Schweißbereich (20) zur Fixierung des Zwischenstücks (7) im Innern des Gehäuses (4) und eine erste Bohrung (6) durch besagtes Gehäuse (4) und eine zweite Bohrung (7) durch besagtes Stück (7) umfasst, die bei Anordnung des Zwischenstücks (7) im Innern des Gehäuses (4) so ausgerichtet sind, dass das andere Ende des Streifens (2) die besagten Bohrungen (6, 9) zur Verriegelung des besagten Siegels (1) passiert, **dadurch gekennzeichnet, dass**
- das Zwischenstück (7) einen Hohlraum (10) umfasst und
 - das Siegel (1) einen Rahmen (11) umfasst, der im Innern des Hohlraums (10) des Zwischenstücks (7) angeordnet ist und eine dritte Bohrung (12) aufweist, die sich bei Anordnung des Zwischenstücks (7) im Innern des Gehäuses (4) mit der ersten und zweiten Bohrung (6, 9) deckt, und

- mindestens ein innerer Rand (15) im Zwischenstück (7) in einer der Wände des Hohlraums (10) zur Verbindung mit mindestens einem Rand (14) des Umfangs des Rahmens (11) ausgebildet ist.
2. Siegel (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Zwischenstück (7) auf dessen Außenfläche mindestens einen rauen Bereich (8) umfasst, der der Innenfläche des Gehäuses (4) im mindestens einen Schweißbereich (20) entspricht. 10
 3. Siegel (1) nach Anspruch 2, **dadurch gekennzeichnet, dass** der besagte, mindestens eine raue Bereich (8) Rippen umfasst, die senkrecht zur Einführrichtung des Zwischenstücks (7) in das Gehäuse (4) ausgerichtet sind. 15
 4. Siegel (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Wände der dritten Bohrung (12) des Rahmens (11) Zähne (13) umfassen, die mit der Außenfläche des besagten Streifens (2) zusammenwirken, wodurch der Durchgang des besagten Streifens (2) in Einführrichtung des Streifens (2) in die dritte Bohrung (12) ermöglicht und dessen Entnahme in entgegengesetzter Richtung verhindert wird. 20 25
 5. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es eine Schwächungskerbe (22) zwischen dem flexiblen Streifen (2) und dem Körper (3) umfasst. 30
 6. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es auf einer Oberfläche mindestens eine Spitze (24) umfasst, die ausgebildet ist, um in Kontakt mit einem zu versiegelnden Gegenstand zu stehen. 35
 7. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es im Körper (3) eine an das Gehäuse (4) angrenzende Bohrung (25) umfasst. 40
 8. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Rahmen (11) aus Metall besteht. 45
 9. Siegel nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Streifen (2) einen im Wesentlichen rechteckigen Querschnitt aufweist. 50
 10. Siegel nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet, dass** der Streifen (2) einen im Wesentlichen kreisförmigen Querschnitt aufweist. 55
 11. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gehäuse (4) und das Zwischenstück (7) aus dem gleichen Material bestehen.
 12. Siegel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gehäuse (4) und das Zwischenstück (7) aus Kunststoffmaterial bestehen.
 13. Verfahren zur Herstellung eines Siegels (1), das einen flexiblen Streifen (2), einen an einem Ende des besagten flexiblen Streifens (2) angeordneten Körper (3), ein im besagten Körper (3) angeordnetes Gehäuse (4) mit einer ersten Bohrung (6) und ein im Innern des besagten Gehäuses (4) angeordnetes Zwischenstück (7) mit einem Hohlraum (10) und einer zweiten Bohrung (9) durch das besagte Stück (7) umfasst, sodass sich die erste Bohrung (6) und die zweite Bohrung (9) decken und der Streifen (2) besagte Bohrungen (6, 9) passiert, **dadurch gekennzeichnet, dass** es folgende Schritte umfasst:
 - Einführen eines Rahmens (11) in den Hohlraum (10) des Zwischenstücks (7) und Befestigen des Rahmens (11) am Zwischenstück (7) durch Verbinden von mindestens einem inneren Rand (15) einer der Wände des Hohlraums (10) des Zwischenstücks (7) mit mindestens einem Rand (14) des Umfangs des Rahmens (11);
 - Einführen des Zwischenstücks (7) in das Gehäuse (4);
 - Bildung mindestens eines Schweißbereichs (20), wobei die Innenfläche des besagten Gehäuses (4) und die Außenfläche des besagten Zwischenstücks (7) miteinander verschweißt sind.
 14. Verfahren nach Anspruch 13, **dadurch gekennzeichnet, dass** der mindestens eine Schweißbereich (20) durch Anwendung von Hitze aus der Außenfläche des besagten Gehäuses (4) gebildet wird.
 15. Verfahren nach Anspruch 14, **dadurch gekennzeichnet, dass** die Anwendung von Hitze mittels einer Sonotrodevorrichtung (14) erfolgt.
 16. Verfahren nach einem der Ansprüche 13 bis 15, **dadurch gekennzeichnet, dass** das Zwischenstück (7) auf dessen Außenfläche mindestens einen rauen Bereich (8) umfasst, der dem mindestens einen Schweißbereich (20) zwischen der Innenfläche des Gehäuses (4) und der Außenfläche des Zwischenstücks (7) entspricht.
 17. Verfahren nach Anspruch 16, **dadurch gekennzeichnet, dass** der besagte, mindestens eine raue Bereich (8) Rippen umfasst, die senkrecht zur Einführrichtung des Zwischenstücks (7) in das Gehäuse (4) ausgerichtet sind.

18. Verfahren nach einem der Ansprüche 13 bis 17, **dadurch gekennzeichnet, dass** der Rahmen (11) aus Metall besteht.
19. Verfahren nach einem der Ansprüche 13 bis 18, **dadurch gekennzeichnet, dass** das Gehäuse (4) und das Zwischenstück (7) aus dem gleichen Material bestehen.
20. Verfahren nach Anspruch 19, **dadurch gekennzeichnet, dass** das Gehäuse (4) und das Zwischenstück (7) aus Kunststoffmaterial bestehen.

Revendications

1. Joint (1) comprenant une bande flexible (2), un corps (3) disposé à une extrémité de ladite bande flexible (2), un logement (4) disposé dans ledit corps (3), une pièce intermédiaire (7) qui est disposée à l'intérieur dudit logement (4), au moins une zone de soudage (20) qui est formée entre la surface interne du logement (4) et la surface externe de la pièce intermédiaire (7) pour fixer la pièce intermédiaire (7) à l'intérieur du logement (4), et un premier trou (6) à travers ledit logement (4) et un deuxième trou (9) à travers ladite pièce (7) qui sont alignés lorsque la pièce intermédiaire (7) est disposée à l'intérieur du logement (4), de façon que l'autre extrémité de la bande (2) traverse lesdits trous (6, 9) pour bloquer ledit joint (1), **caractérisé en ce que** :
- la pièce intermédiaire (7) comprend une cavité (10), et
 - le joint (1) comprend une armature (11) disposée à l'intérieur de la cavité (10) de la pièce intermédiaire (7) et possédant un troisième trou (12) aligné avec les premier et deuxième trous (6, 9) lorsque la pièce intermédiaire (7) est disposée à l'intérieur du logement (4), et
 - au moins un bord interne (15) dans la pièce intermédiaire (7) dans l'une des parois de la cavité (10) adapté pour un accouplement avec au moins un bord (14) du périmètre de l'armature (11).
2. Joint (1), selon la revendication 1, **caractérisé en ce que** la pièce intermédiaire (7) comprend au moins une zone brute (8) sur sa surface externe en correspondance avec la surface interne du logement (4) au niveau de la au moins une zone de soudage (20).
3. Joint (1), selon la revendication 2, **caractérisé en ce que** ladite au moins une zone brute (8) comprend des nervures perpendiculaires au sens d'insertion de la pièce intermédiaire (7) dans le logement (4).
4. Joint (1), selon la revendication 1, **caractérisé en**

ce que les parois du troisième trou (12) de l'armature (11) comprennent des dents (13) coopérant avec la surface externe de ladite bande (2) permettant le passage de ladite bande (2) dans le sens d'insertion de la bande (2) dans le troisième trou (12) et empêchant son extraction dans le sens opposé.

5. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce qu'il** comprend une fente d'affaiblissement de zone (22) entre la bande flexible (2) et le corps (3).
6. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce qu'il** comprend au moins un bout (24) sur une surface configurée pour être en contact avec un objet à sceller.
7. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce qu'il** comprend un trou (25) dans le corps (3), situé de façon à être adjacent au logement (4).
8. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** l'armature (11) est en métal.
9. Joint, selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** la bande (2) comprend une section transversale substantiellement rectangulaire.
10. Joint, selon n'importe laquelle des revendications 1 à 9, **caractérisé en ce que** la bande (2) comprend une section transversale substantiellement circulaire.
11. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** le logement (4) et la pièce intermédiaire (7) sont fabriqués dans le même matériau.
12. Joint (1), selon n'importe laquelle des revendications précédentes, **caractérisé en ce que** le logement (4) et la pièce intermédiaire (7) sont fabriqués en matière plastique.
13. Procédé pour la fabrication d'un joint (1) qui comprend une bande flexible (2), un corps (3) disposé à une extrémité de ladite bande flexible (2), un logement (4) avec un premier trou (6) et qui est disposé dans ledit corps (3), et une pièce intermédiaire (7) possédant une cavité (10) et un deuxième trou (9) à travers ladite pièce (7) et qui est disposée à l'intérieur dudit logement (4) pour que le premier trou (6) et le deuxième trou (9) soient alignés et que la bande (2) traverse lesdits trous (6, 9), **caractérisé en ce qu'il** comprend les étapes consistant à :

- insérer une armature (11) dans la cavité (10) de la pièce intermédiaire (7) et fixer l'armature (11) dans la pièce intermédiaire (7) en accouplant au moins un bord interne (15) de l'une des parois de la cavité (10) de la pièce intermédiaire (7) avec au moins un bord (14) du périmètre de l'armature (11) ; 5
 - insérer la pièce intermédiaire (7) dans le logement (4) ;
 - former au moins une zone de soudage (20) dans laquelle la surface interne dudit logement (4) et la surface externe de ladite pièce intermédiaire (7) sont soudées l'une à l'autre. 10
14. Procédé, selon la revendication 13, **caractérisé en ce que** la au moins une zone de soudage (20) est formée par application de chaleur à partir de la surface externe dudit logement (4). 15
15. Procédé, selon la revendication 14, **caractérisé en ce que** l'application de chaleur est réalisée au moyen d'un dispositif à sonotrode (14). 20
16. Procédé selon n'importe laquelle des revendications 13 à 15, **caractérisé en ce que** la pièce intermédiaire (7) comprend au moins une zone brute (8) sur sa surface externe en correspondance avec la au moins une zone de soudage (20) entre la surface interne du logement (4) et la surface externe de la pièce intermédiaire (7). 25 30
17. Procédé, selon la revendication 16, **caractérisé en ce que** ladite au moins une zone brute (8) comprend des nervures perpendiculaires au sens d'insertion de la pièce intermédiaire (7) dans le logement (4). 35
18. Procédé selon n'importe laquelle des revendications 13 à 17, **caractérisé en ce que** l'armature (11) est en métal. 40
19. Procédé selon n'importe laquelle des revendications 13 à 18, **caractérisé en ce que** le logement (4) et la pièce intermédiaire (7) sont fabriqués dans le même matériau. 45
20. Procédé, selon la revendication 19, **caractérisé en ce que** le logement (4) et la pièce intermédiaire (7) sont fabriqués en matière plastique. 50

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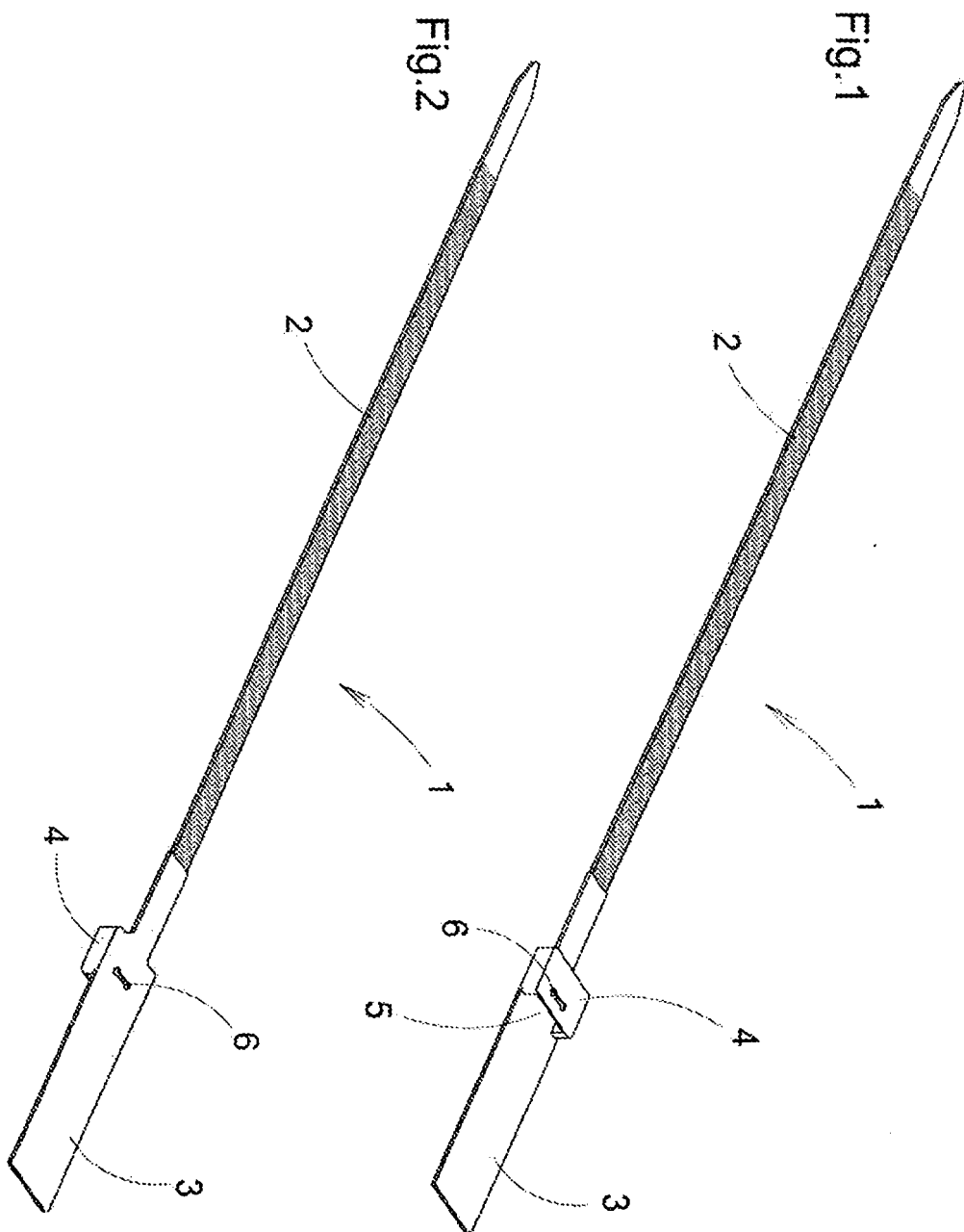


Fig.3

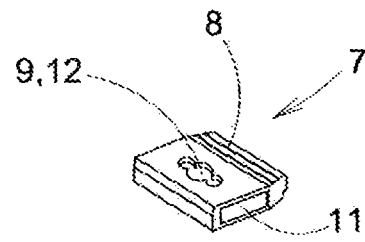
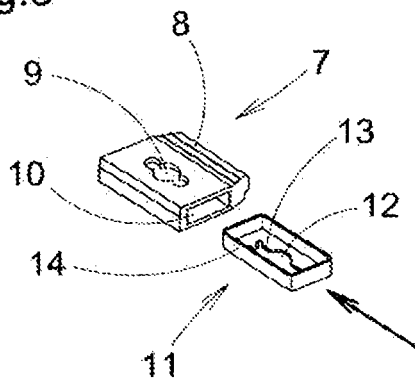


Fig. 4

Fig.5

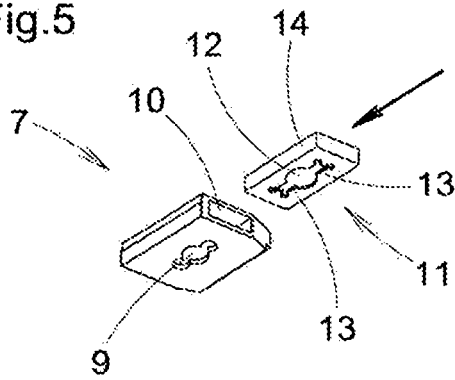


Fig.6

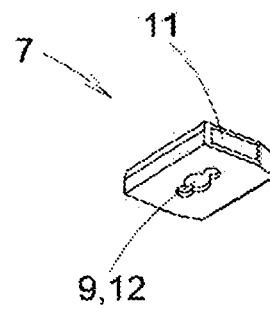


Fig.7

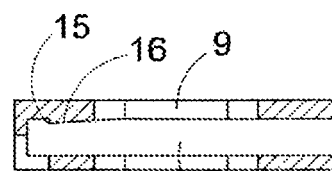


Fig.8

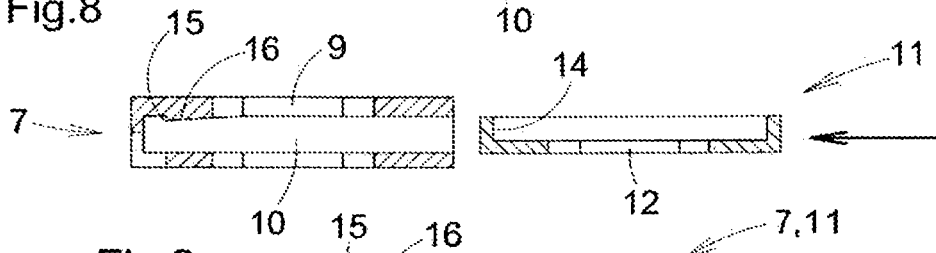


Fig.9

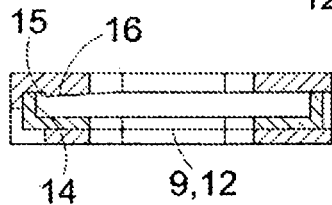


Fig. 10

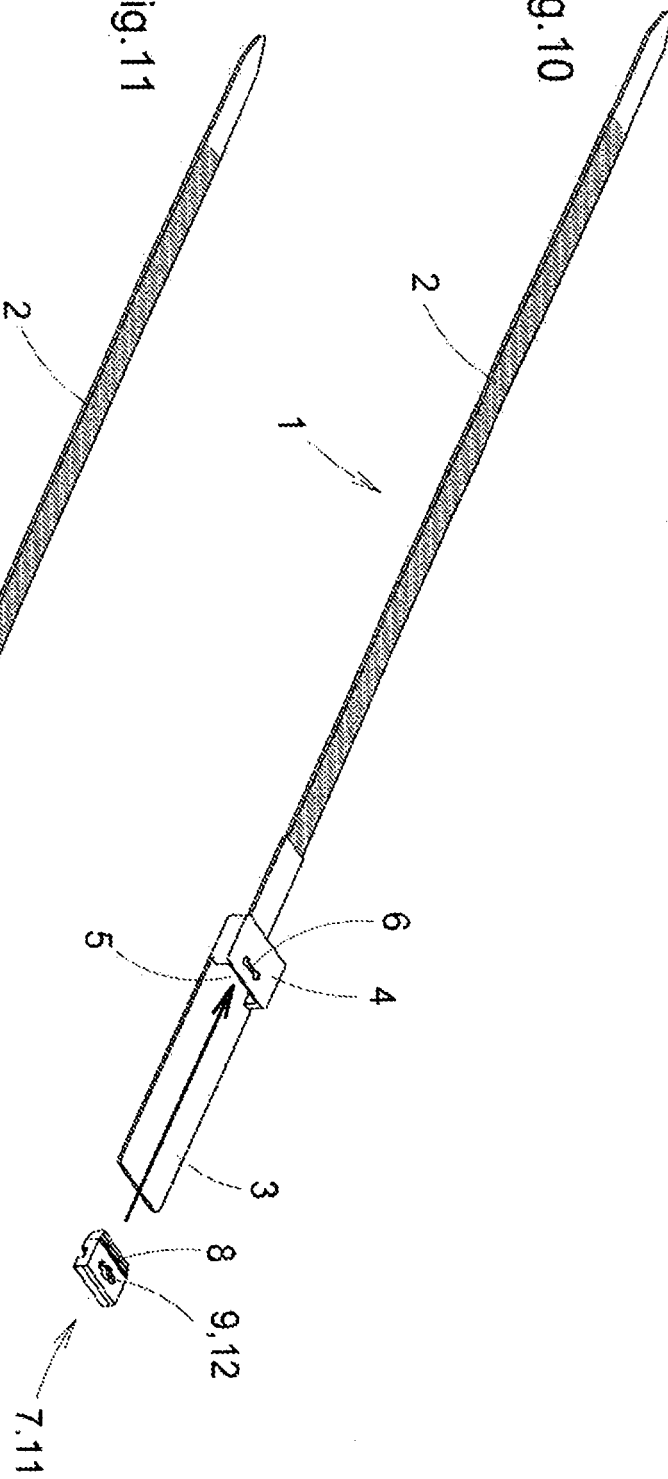
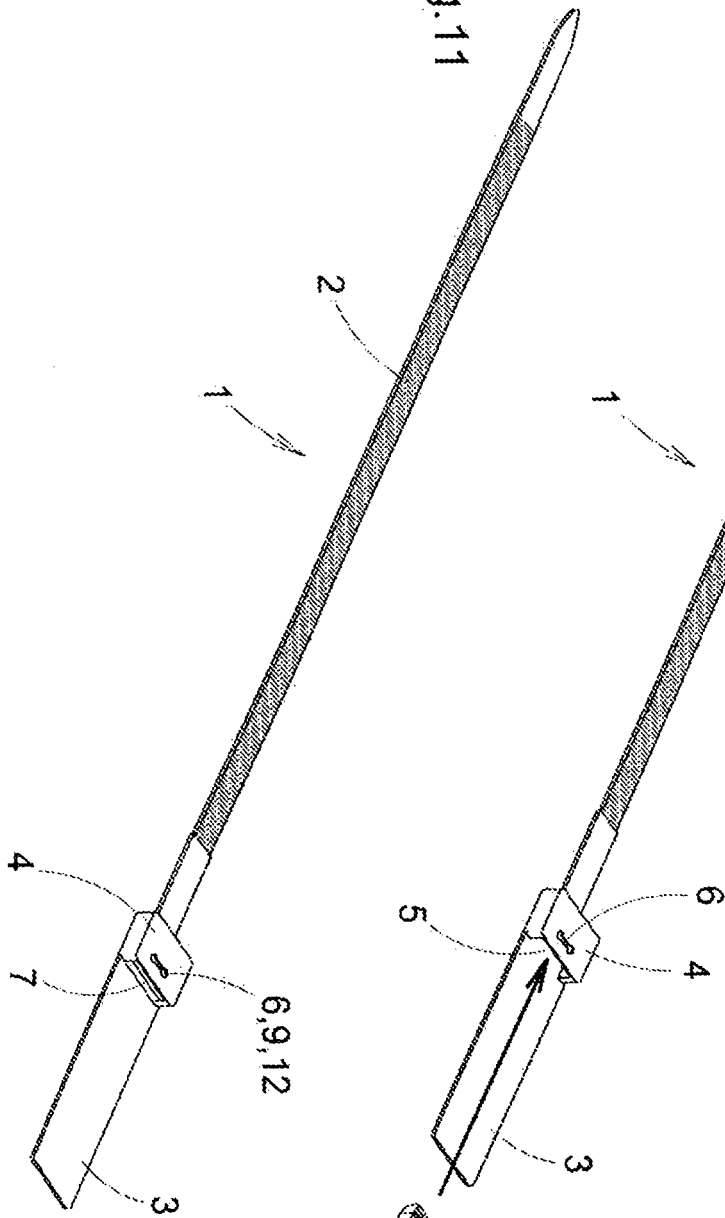
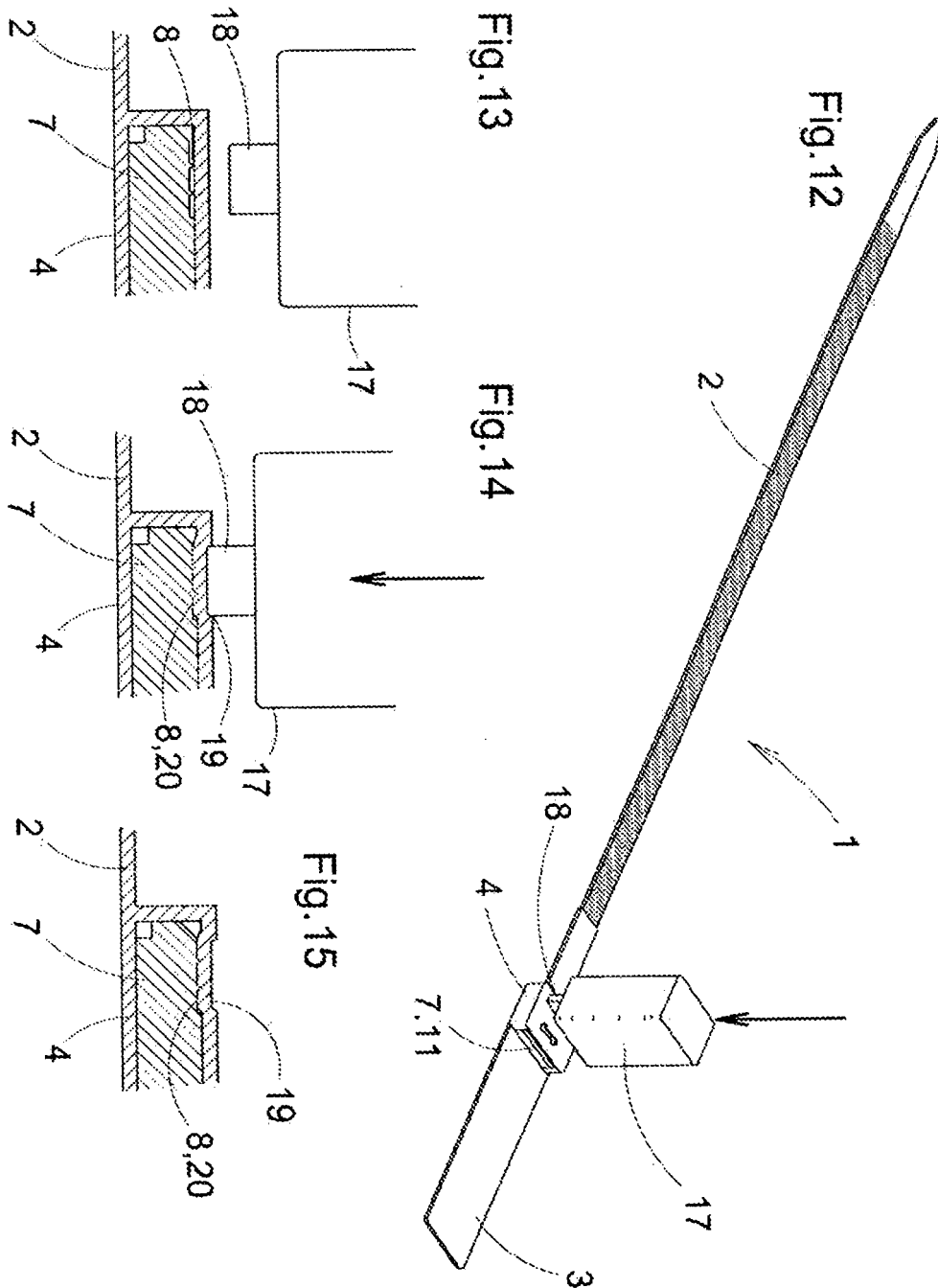


Fig. 11





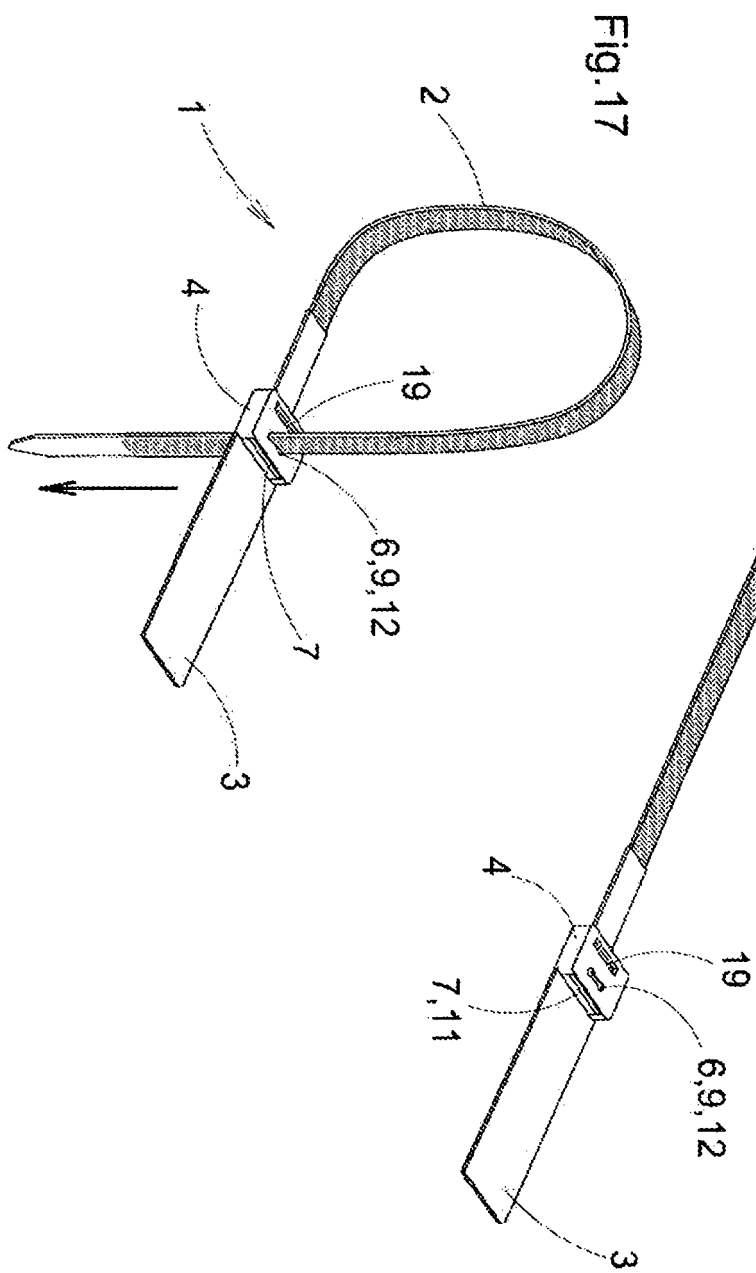


Fig.18

Fig.19

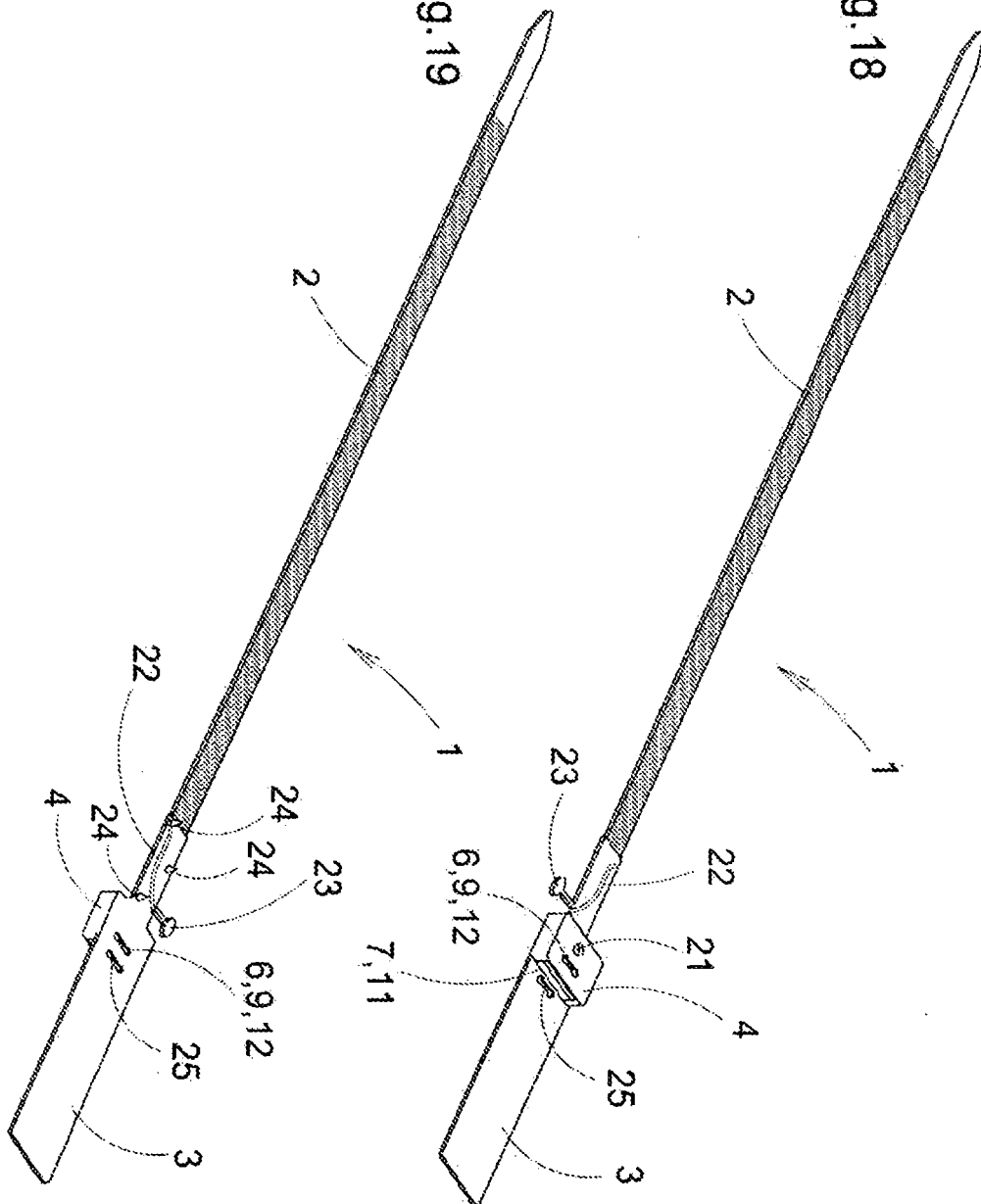


Fig.20

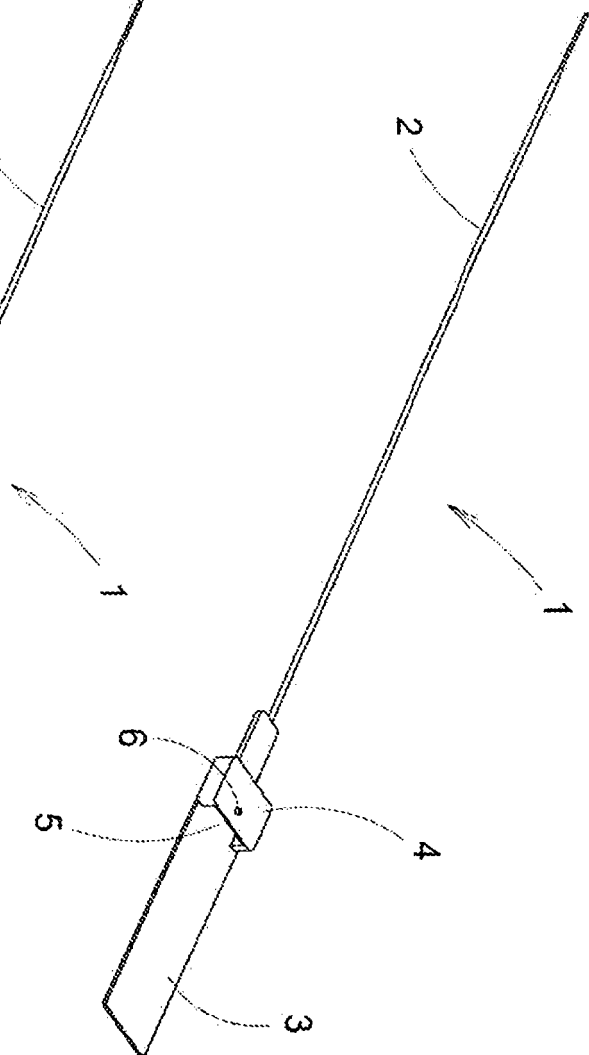
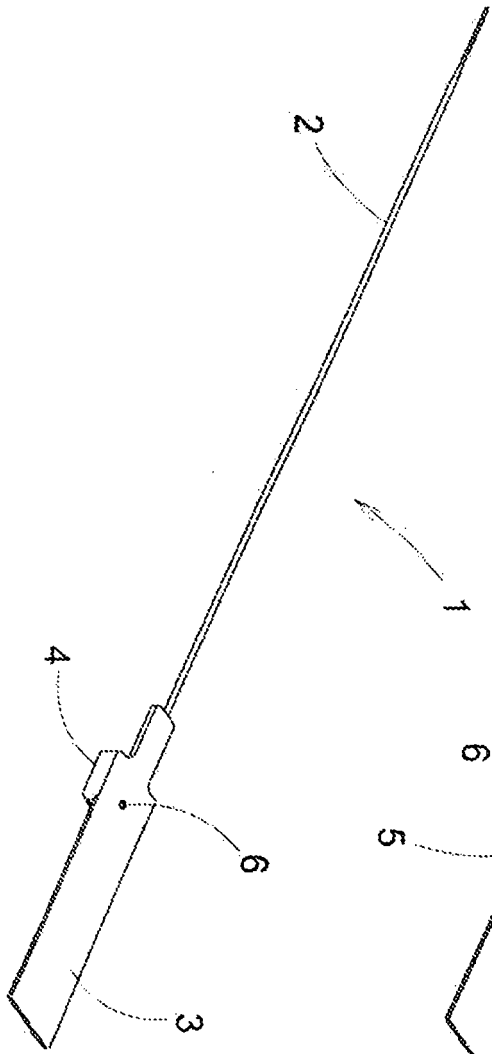


Fig.21



REFERENCES CITED IN THE DESCRIPTION

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