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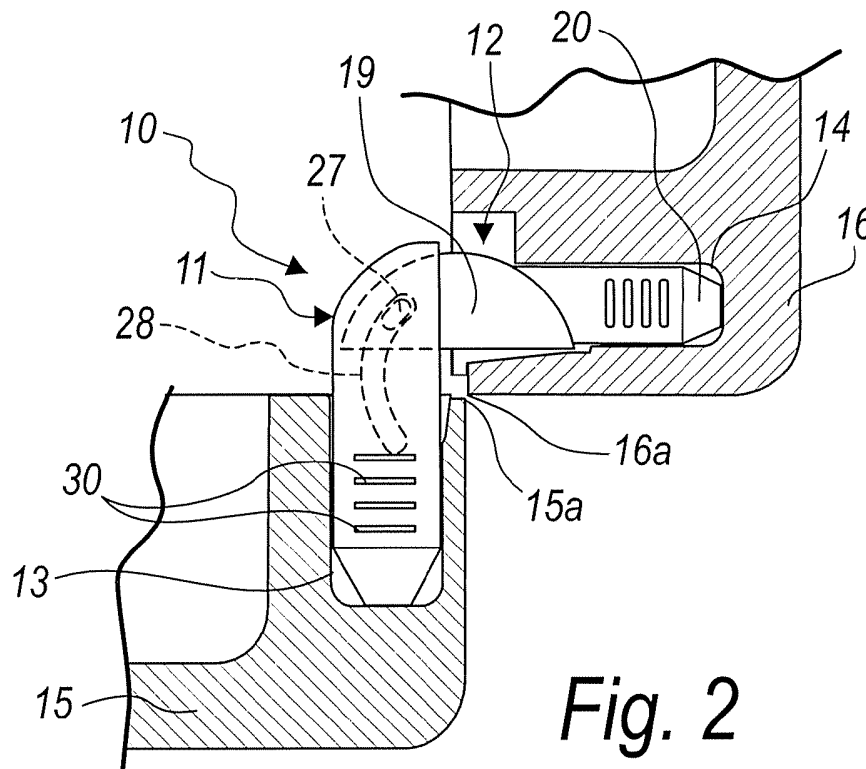
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(54) **Hinge for box-like bodies, doors of pieces of furniture and the like**

(57) A hinge (10) for box-like bodies, doors of pieces of furniture and the like, comprising two elements (11, 12) to be inserted so as to retract into corresponding seats (13, 14) respectively of a first part (15) and of a second part (16) of a box-like body (17) or of a door and of a side of a piece of furniture, a first element (11), to be inserted at least partly in a first seat (13), which is com-

posed of two half-shells (11a, 11b), which are closed by way of means for fixing to each other, so as to form a compartment (18) with a circular arc-like profile that is adapted to accommodate internally the rotation of a first complementarily shaped portion (19) of the second element (12), a second portion (20) extending from the first portion (19) and being designed to be inserted in its seat (14).



Description

[0001] The present invention relates to a hinge, particularly for box-like bodies, doors of pieces of furniture and the like.

[0002] Shops that sell valuable articles, such as for example jewels, watches, eyeglasses and the like, usually complement the valuable item with a case of at least equal value both aesthetically and in terms of strength.

[0003] Currently known cases are constituted generally by a first part, predominantly for containment, in which the valuable item is stored, and by at least one second part, predominantly for closure, i.e., a lid constituted either by a single element or by two elements, which are hinged on two opposite sides of the first part.

[0004] Such at least one second closure part is coupled to the first containment part by means of a hinge.

[0005] The most widely used and known hinges are predominantly of two types.

[0006] A first type is constituted by hinges made of plastics, which are formed by a plate from which one or more inserts extend which are adapted to be inserted in corresponding seats on the edges of the first or second parts to be mutually articulated.

[0007] The plate has a lightened central linear portion that is designed to be folded through at least 90° and forms at the same time the rotation axis for the second part for closure onto the first containment part.

[0008] Such first type of hinge, despite being cheap and therefore widely used, is subject to breakage, since the lightened portion, while on the one hand can be folded easily, on the other hand after a certain number of opening/closing cycles may have yielded to the point of breaking.

[0009] A second type of hinge is the one made of metallic material, constituted by two metal plates that are provided with hinges and are coupled by means of a pivot.

[0010] Although such hinges are higher in value than plastic hinges, they are therefore very expensive, since they are formed by at least three components (two plates and the pivot).

[0011] Most of all, such hinges are visible from the back of the box-like body with which they are associated at least by means of their pivoting elements, the hinge plates and the pivot, and this from the point of view of visual impact might not be appreciated by the buyer or user.

[0012] In particular, if applied to box-like bodies made of wooden material, such hinges require an appropriately provided beveling, which is already in itself unsightly, of the facing rear edges of the containment body and of the lid of the box-like body, to prevent such edges from touching, preventing correct opening, or from sliding on each other upon opening of the box-like body, with the risk of spoiling the appearance of the box-like body.

[0013] Further, such hinges generally also comprise an elastic element that is adapted to keep open the case with which they are associated.

[0014] EP1736418 in the name of this same Applicant discloses a hinge for box-like bodies that is adapted to solve the drawbacks exhibited by the two known types cited above.

[0015] Such hinge is **characterized in that** it is constituted by a pair of mutually opposite rigid or semirigid flaps that are adapted to enter, and be concealed within, corresponding seats respectively of a first containment part and of a second closure part of a box-like body, each of such flaps having at least one portion that is contoured in order to engage, so as to slide tangentially, on a flat longitudinal pivoting element, which has a circular arc-like cross-section and defines the rotation axis for the flaps and the respective associated parts of the box-like body.

[0016] In the preferred but not exclusive embodiment of such hinge, each flap is constituted by at least two plates, which are arranged side by side longitudinally in series and are mutually coupled by means of a projection that protrudes longitudinally from a first plate to be forced in a complementary shaped hole of the associated subsequent second plate.

[0017] Despite achieving the intended aim and objects, this hinge is not particularly strong and is scarcely suitable especially for box-like bodies made of wood of considerable thickness, with a relatively large weight that cannot be withstood by the structure of the hinge as described and claimed in EP1736418.

[0018] The limited strength of the hinge according to EP 173 6418 further does not allow to apply it in other fields of applicability, such as for example the articulation of doors of pieces of furniture.

[0019] Moreover, this plurality of components that form the preferred embodiment of such hinge causes a certain complexity which then affects the production and assembly costs, which are not negligible.

[0020] The aim of the present invention is to provide a hinge for box-like bodies, doors of pieces of furniture and the like which is capable of obviating the perfectible aspects exhibited by known hinges, increasing its advantages with respect to them.

[0021] Within this aim, an object of the present invention is to provide a hinge that is stronger and easier to install than known types of hinge.

[0022] Another object of the present invention is to provide a hinge that is concealed within the box-like body in which it is installed without having to provide bevels or perform other specific work on the box-like body.

[0023] Another object of the present invention is provide a hinge that allows to maintain the open configuration of the box-like body even in the absence of dedicated elastic elements.

[0024] Another object of the present invention is to provide a hinge that can be obtained cheaply by molding plastic materials.

[0025] A further object of the present invention is to provide a hinge that can be sized and applied also in different fields, such as for example furnishings, furniture

and the like.

[0026] A still further object of the present invention is to provide a hinge for box-like bodies, doors of pieces of furniture and the like that can be manufactured cheaply with known systems and technologies.

[0027] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a hinge for box-like bodies, doors of pieces of furniture and the like, **characterized in that** it comprises two elements to be inserted so as to retract into corresponding seats respectively of a first containment part and of a second closure part of a box-like body, in corresponding seats of a door and of a side of a piece of furniture, a first element, to be inserted at least partly in a first seat, being composed of two half-shells, which are closed by way of means for fixing to each other so as to form a compartment with a circular arc-like profile that is adapted to accommodate internally the rotation of a first complementarily shaped portion of said second element, a second portion extending from said first portion being designed to be inserted in its seat, between the lateral faces of said first portion of said second element and the facing internal surfaces of said compartment there being stroke limiting means adapted to limit the relative rotation of the first and second elements.

[0028] Further characteristics and advantages of the invention will become better apparent from the following detailed description of two preferred but not exclusive embodiments thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a view of a box-like body with two hinges according to the invention in a first embodiment thereof;

Figure 2 is a sectional side view of a detail of the box-like body of Figure 1 in the open configuration; Figure 3 is a perspective view of the first embodiment of the hinge according to the invention in the closed configuration;

Figure 4 is a perspective view of the hinge of Figure 3 according to the invention in the open configuration;

Figure 5 is an exploded perspective view of the hinge according to the invention in its first embodiment;

Figure 6 is a view of the box-like body with two hinges according to a second embodiment of the invention;

Figure 7 is a detail of a sectional side view of the box-like body of Figure 6 in the closed configuration;

Figure 8 is a view of the detail of Figure 7 in the partially open configuration;

Figure 9 is a view of the detail of Figure 7 in the fully open configuration;

Figure 10 is an exploded perspective view of the hinge according to the invention in its second embodiment;

Figure 11 is a perspective view of the second embodiment of the hinge according to the invention in a partially open configuration;

Figure 12 is a perspective view of the second embodiment of the hinge according to the invention in the closed configuration.

5 **[0029]** With reference to the figures, a hinge for box-like bodies, doors of pieces of furniture and the like according to the invention is generally designated by the reference numeral 10 in its first embodiment.

10 **[0030]** The hinge 10, shown in Figures 1 to 5, comprises two elements 11 and 12 to be inserted so as to be concealed in corresponding seats 13 and 14 respectively of a first containment part 15 and of a second closure part 16 of a box-like body 17.

15 **[0031]** The second element 12 can be extracted by rotation from the first element 11.

[0032] As an alternative, and with the same functionality, the first element 11 can be inserted so as to be concealed into a corresponding seat of a door, with the second element 12 inserted in a further seat on one side of a piece of furniture: an application which is not illustrated for the sake of simplicity but is to be understood as within the scope of the claims.

20 **[0033]** The first element 11, to be inserted at least partly in the first seat 13, is composed of two half-shells 11a, 11b, which are closed by way of means for fixing to each other, so as to form a compartment 18 that has a circular arc-like profile and is adapted to accommodate internally the rotation of a first complementarily shaped portion 19 of the second element 12.

25 **[0034]** A second portion 20, designed to be inserted in its seat 14, protrudes from the first portion 19 of the second element 12.

[0035] Stroke limiting means, described in greater detail hereinafter, are formed between lateral faces 21 and 22 of the first portion 19 of the second element 12 and facing internal surfaces 23, 24 of the compartment 18 and are adapted to limit the relative rotation of the first element 11 and the second element 12.

35 **[0036]** The means for mutual fixing of the two half-shells 11a, 11b are constituted, by way of non-limiting example of the invention, by substantially cylindrical projections 25 that protrude from the first half-shell 11a toward the other second half-shell 11b and are adapted to be forced in corresponding holes 26 formed in the second half-shell 11b.

40 **[0037]** The stroke limiting means are constituted by protrusions 27 that extend from each one of the lateral faces 21 and 22 of the first portion 19 of the second element 12.

45 **[0038]** Each one of the two protrusions 27 is arranged so as to slide in a recessed slot 28, which lies along a circular arc, on the inside of the corresponding half-shell 11a, 11b.

50 **[0039]** The center of the arc of the circular arc-like profile of the first portion 19 and of the corresponding complementarily shaped compartment 18 and the center of the circular arc of the profile of the slot 28, which coincide, determine the rotation axis of the hinge 10 according to

the invention.

[0040] The elements 11 and 12 of the hinge 10 are provided and arranged in the corresponding seats 13 and 14 so that the rotation axis is located at facing outer edges 15a and 16a of the first part 15 and of the second part 16 of the box-like body 17.

[0041] With the hinge 10 according to the invention, the first part 15 and the second part 16 of the box-like body 17 can rotate freely and fully with respect to each other even without beveling their edges 15a and 16a.

[0042] In particular, if applied to box-like bodies made of wooden material, such a hinge does not require an appropriately provided unsightly beveling of the facing rear edges of the containment body and of the lid of the box-like body, such bevels, as mentioned, being adapted to prevent the edges from touching each other, preventing correct opening, or from sliding on each other upon opening the box-like body, with the risk of spoiling the appearance of the box-like body.

[0043] These above cited particularities further allow the substantial concealment from sight of the hinges 10 when the box-like body 17 is closed.

[0044] This solution is particularly convenient and of pleasant visual impact especially for box-like bodies made of wooden material, whose working is always relatively delicate and onerous, and further compromises the lateral surface continuity of the closed box-like body.

[0045] Part of the outer surface of the first element 11 and part of the outer surface of the second portion 20 of the second element 12 have a plurality of grip protrusions, respectively 30 and 31, which are adapted to facilitate the grip of the first and second elements 11 and 12 within the respective seats 13 and 14, making their unwanted extraction difficult.

[0046] Figures 6 to 12 illustrate the hinge according to the invention in a second embodiment, designated by the reference numeral 110.

[0047] The hinge 110 comprises three elements, of which the two end ones 111 and 112 are to be inserted so as to be concealed in corresponding seats 113 and 114 respectively of a first containment part 115 and of a second closure part 116 of a box-like body 117.

[0048] The hinge 110 also comprises a third intermediate element 132, which allows the hinge to open at 180°.

[0049] The second element 112 can be extracted by rotation from the third element 132, which in turn can be extracted by rotation from the first element 111.

[0050] The first element 111 is composed of two half-shells 111a, 111b, which are closed onto each other by way of fixing means so as to form a compartment with a circular arc-like profile that is adapted to accommodate inside it the rotation of a first complementarily shaped portion of the third element 132, such first portion of the third element 132 being in turn composed of two half-shells 132a and 132b, as shown in Figure 10.

[0051] The third element 132 is completed by a second portion 132c, which is adapted to cooperate with the two

half-shells 111a and 111b of the first element in forming the compartment with the circular arc-like profile for the rotation of the first portion of the third element 132.

[0052] The two half-shells 132a and 132b that define the first portion of the third element 132 are closed by way of fixing means onto each other, so as to form a compartment 133 with a circular arc-like profile that is adapted to accommodate inside it the rotation of a first complementarily shaped portion 119 of the second element 112.

[0053] A second portion 120 designed to be inserted in its seat 114 extends from the first portion 119 of the second element 112.

[0054] Stroke limiting means are formed between the lateral faces 134 and 135 of the first portion of the third element 132 and the facing internal surfaces 123, 124 of the compartment for the third element 132 respectively, and are adapted to limit the relative rotation of the first element 111 and of the second element 112.

[0055] Likewise, stroke limiting means are formed between the lateral faces 121 and 122 of the first portion 119 of the second element 112 and the facing internal surfaces 136, 137 of the rotation compartment 133 for the third element 132 and are adapted to limit the relative rotation of the second element 112 and of the third element 132.

[0056] The means for mutual fixing of the corresponding half-shells 11a and 11b, such as 132a and 132b, as well as the means for fixing the second portion 132c of the third element 132 between the two half-shells 111a and 111b of the first element 111 are provided, by way of non-limiting example of the invention, by substantially cylindrical projections 138 that protrude from the second portion 132c of the third element 132 toward the two half-shells 111a and 111b and are adapted to be forced in corresponding holes 126 formed in the half-shells 111a and 111b.

[0057] The stroke limiting means are constituted by protrusions 127 and 139 that extend respectively from the first portion 119 of the second element 112 and from the half-shells 132a and 132b of the third element 132.

[0058] Each one of the protrusions 127 and 139 is arranged so as to slide within a recessed slot 128 and 140, which is extended along a circular arc on the inside of the corresponding facing half-shell 132a and 132b, as well as 111a, 111b.

[0059] The elements 111, 112 and 132 of the hinge 110, in its second embodiment, are provided and arranged in the corresponding seats 113 and 114 so that the rotation axis is located at the facing outer edges 115a and 116a of the first part 115 and of the second part 116 of the box-like body 117.

[0060] In practice it has been found that the invention thus described achieves the intended aim and objects.

[0061] In particular, the present invention provides a hinge that is stronger and simpler to install than known types of hinge.

[0062] Moreover, the present invention provides a

hinge that is concealed within the box-like body in which it is installed when the box-like body is in the closed configuration without having to provide bevels or other specifically provided work on the box-like body.

[0063] Further, the present invention provides a hinge that allows to maintain the open configuration of the box-like body even in the absence of dedicated elastic elements.

[0064] Moreover, the present invention provides a hinge that can be obtained cheaply by molding plastic materials.

[0065] Moreover, the present invention provides a hinge that can be sized and applied even in different fields, such as for example furnishings, furniture, and the like.

[0066] Moreover, the present invention provides a hinge for box-like bodies, doors of pieces of furniture and the like, which can be manufactured cheaply with known systems and technologies.

[0067] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0068] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0069] The disclosures in Italian Patent Application No. PD2008A000224 from which this application claims priority are incorporated herein by reference.

[0070] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A hinge (10) for box-like bodies, doors of pieces of furniture and the like, **characterized in that** it comprises at least two elements (11, 12), of which the two end ones (11, 12) are designed to be inserted so as to retract into corresponding seats (13, 14) respectively of a first part (15) and of a second part (16) of a box-like body (17) or of a door and of a side of a piece of furniture, said first element (11), to be inserted at least partly in a first seat (13), being composed of two half-shells (11a, 11b), which are closed by way of means for fixing to each other, so as to form a compartment (18) with a circular arc-like profile that is adapted to accommodate internally the rotation of a first complementarily shaped portion (19) of said second element (12), a second portion (20) extending from said first portion (19) and being designed to be inserted in its seat (14), between the lateral faces (21, 22) of said first portion (19) of said

second element (12) and the facing internal surfaces (23, 24) of said compartment (18) there being stroke limiting means adapted to limit the relative rotation of the first element (11) and of the second element (12).

2. The hinge according to claim 1, **characterized in that** it comprises two of said at least two elements (11, 12), a second element (12) being extractable by rotation from the first element (11).

3. The hinge according to claim 1, **characterized in that** said means for mutual fixing of the two half-shells (11a, 11b) are constituted by substantially cylindrical protrusions (25) that protrude from one half-shell (11a) towards the other half-shell (11b) and are adapted to be forced into corresponding holes (26) formed in said other half-shell (11b).

4. The hinge according to the preceding claims, **characterized in that** said stroke limiting means are constituted by at least one protrusion (27) that extends from at least one of said lateral faces of said first portion of said second element (12), said protrusion (27) being arranged so as to slide in an elongated slot (28) that is extended along a circular arc on the inside of a corresponding half-shell (11a, 11b).

5. The hinge according to the preceding claims, **characterized in that** at least part of the outer surface of said first element (11) and at least part of the outer surface of said second portion (20) of said second element (12) have a plurality of grip protrusions (30, 31), which are adapted to facilitate the grip of said first and second elements within the respective seats.

6. The hinge according to the preceding claims, **characterized in that** the center of the arc of the circular arc-like profile of the first portion (19) and of the corresponding complementarily shaped compartment (18) and the center of the circular arc of the profile of the slot (28) coincide, determining the rotation axis of the hinge (10), said elements (11, 12) being provided and positioned in the corresponding seats (13, 14) so that said axis of rotation is located at the facing outer edges (15a, 16a) of the first part (15) and of the second part (16) of the box-like body (17).

7. The hinge according to one or more of the preceding claims, **characterized in that** it comprises three of said at least two elements (111, 112, 132), comprising a third intermediate element (132), which allows the 180° opening of the hinge (110), said second element (112) being extractable by rotation from said third element (132), which in turn can be extracted by rotation from the first element (111).

8. The hinge according to the preceding claim, **characterized in that** said first element (111) is composed of two half-shells (111a, 111b), which are closed by way of means for fixing to each other so as to form a compartment with a circular arc-like profile that is adapted to accommodate internally the rotation of a first complementarily shaped portion of the third element (132), said first portion of the third element (132) being in turn composed of two half-shells (132a, 132b), said third element (132) comprising a second portion (132c) that is adapted to cooperate with the two half-shells (111a, 111b) of the first element (111) in forming the compartment with the circular arc-like profile for the rotation of the first portion of the third element (132).
9. The hinge according to the preceding claim, **characterized in that** the two half-shells (132a, 132b) that define the first portion of the third element (132) are closed by way of means for fixing to each other, so as to form a compartment (133) with a circular arc-like profile that is adapted to accommodate inside it the rotation of a first complementarily shaped portion (119) of the second element (112).

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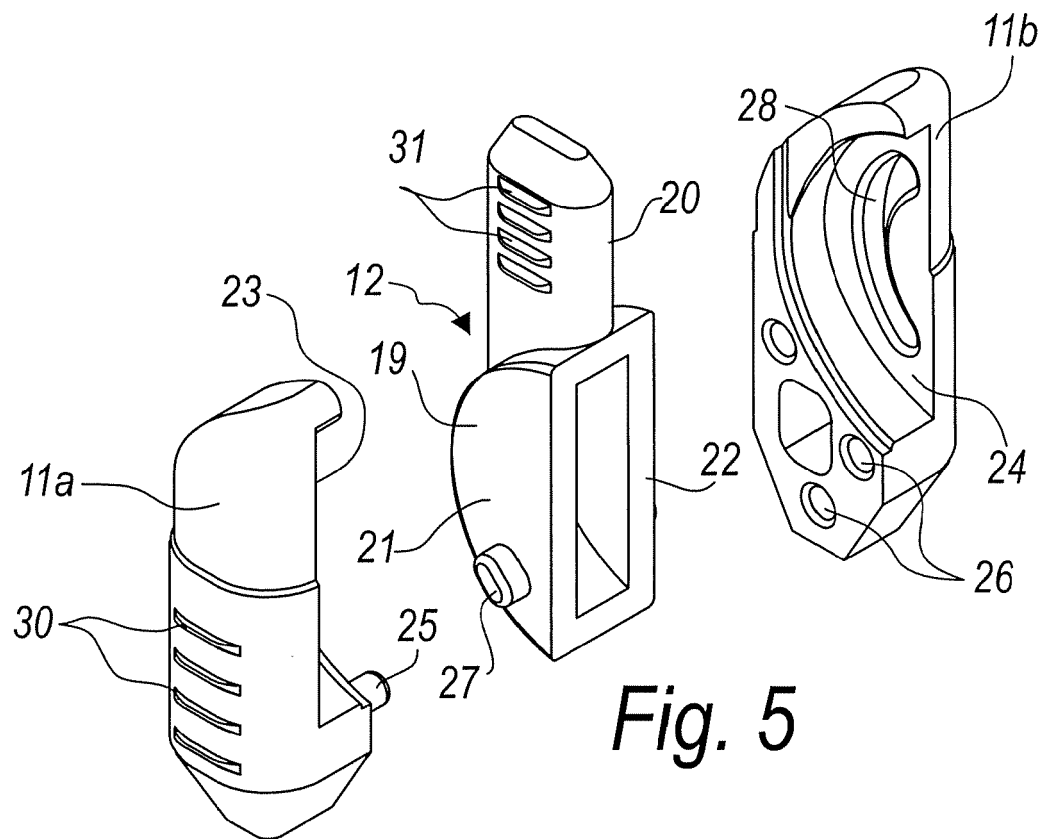
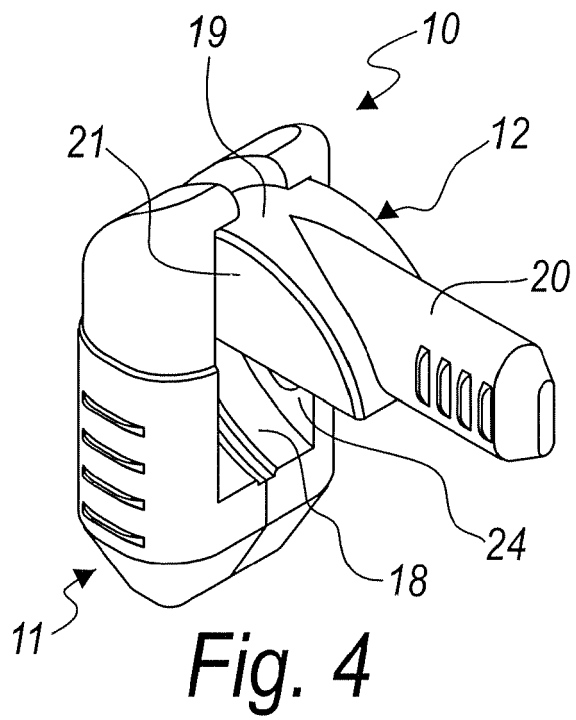
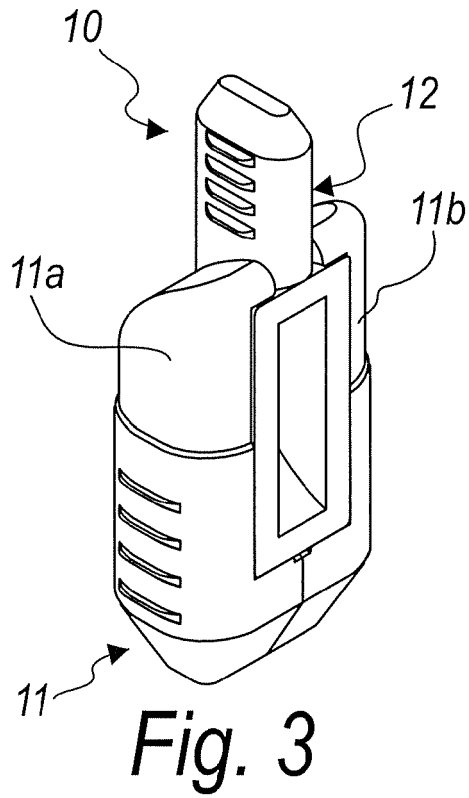
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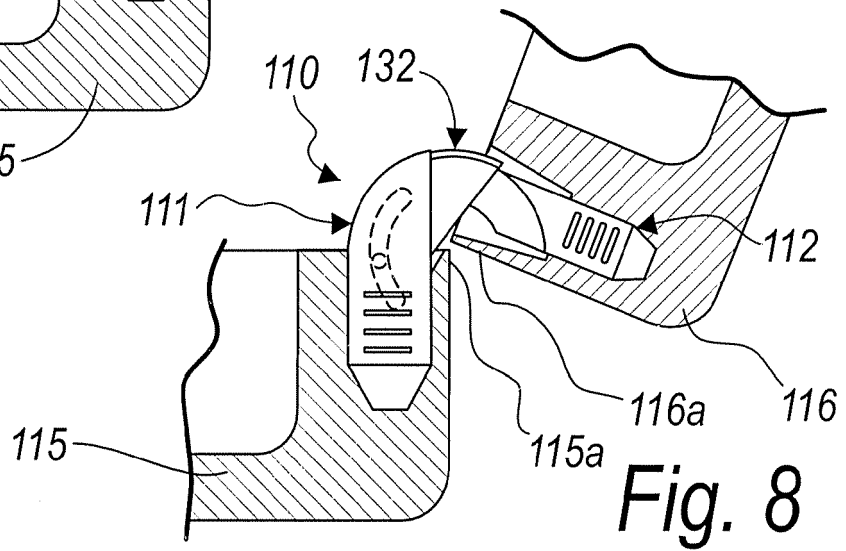
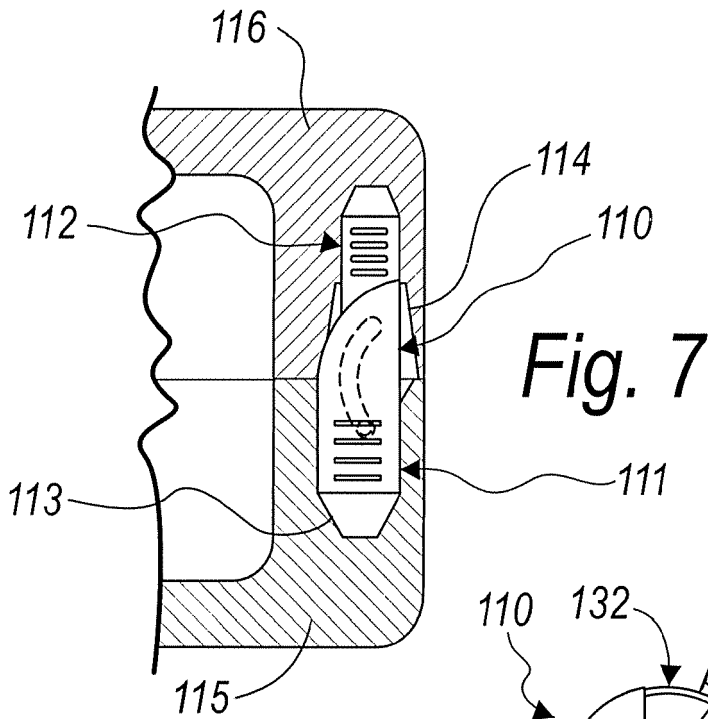
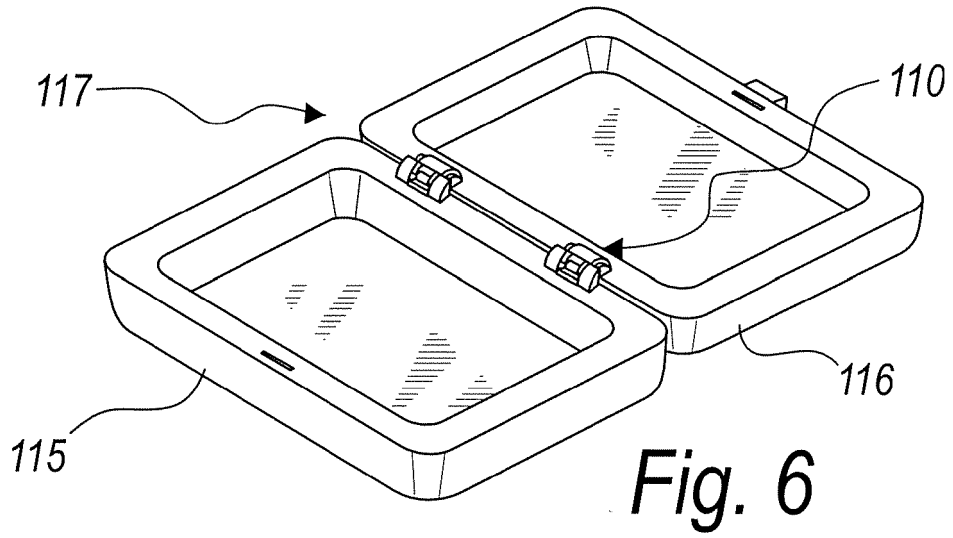
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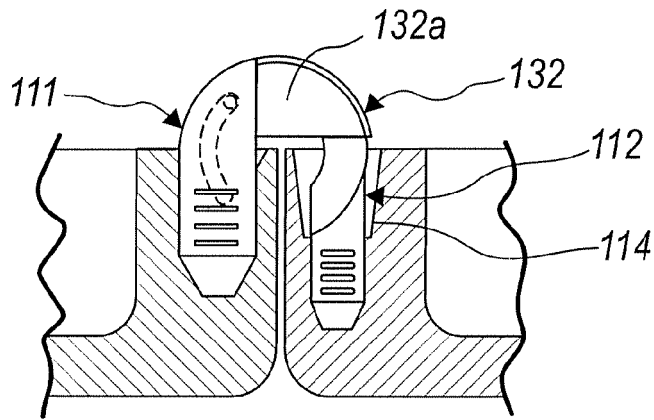


Fig. 9

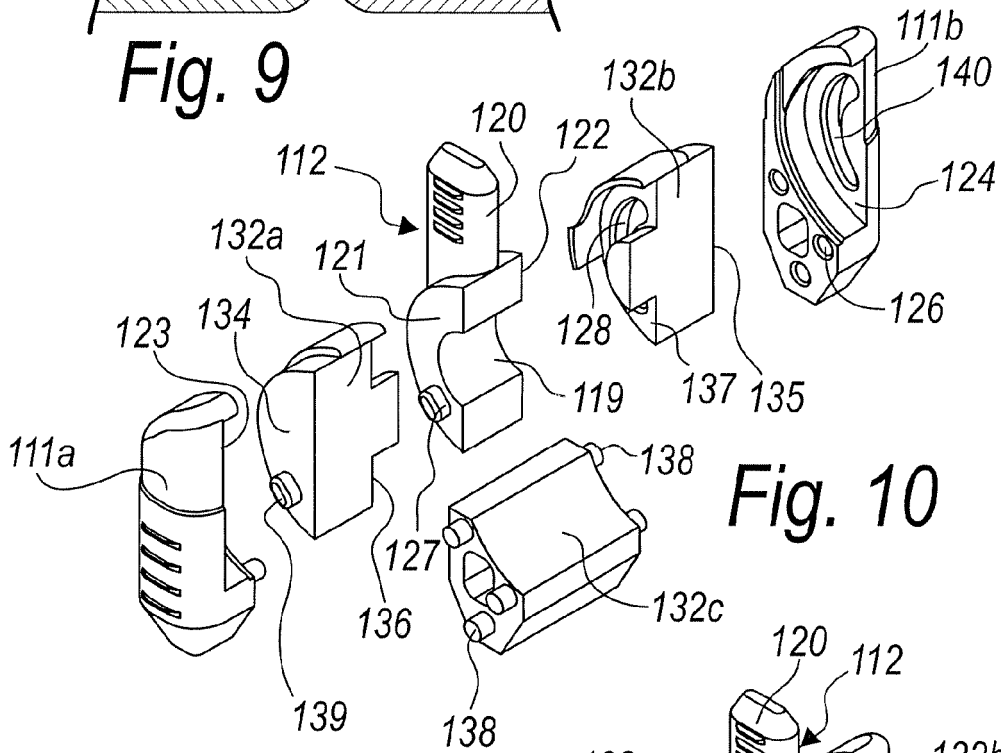


Fig. 10

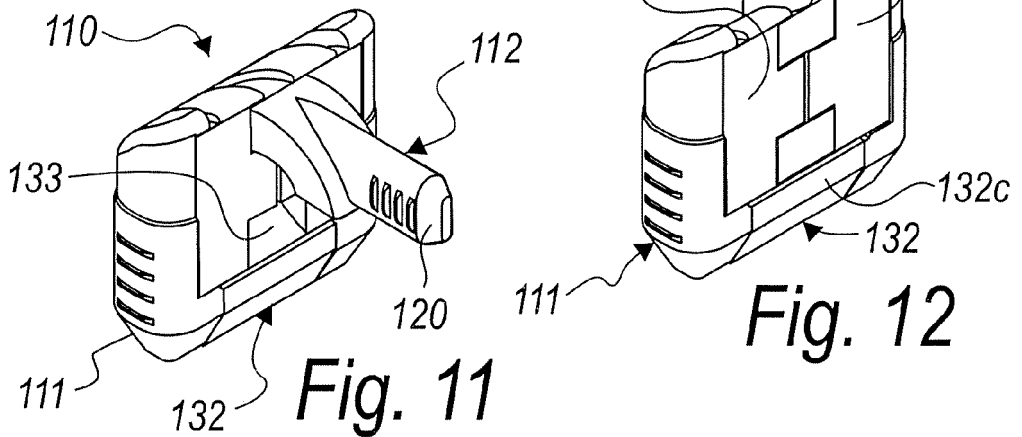


Fig. 11

Fig. 12



EUROPEAN SEARCH REPORT

Application Number
EP 09 16 6482

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
The Hague		24 August 2009	Van Kessel, Jeroen
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 09 16 6482

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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