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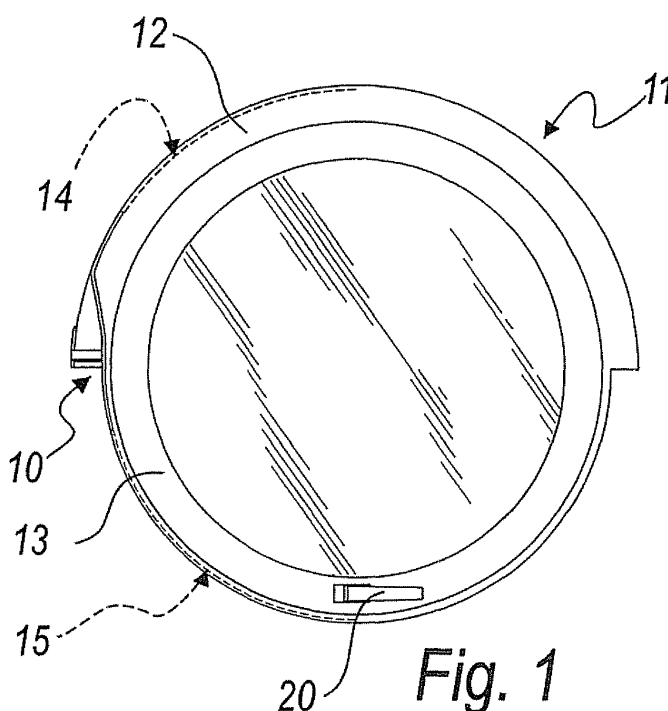
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(54) **Device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type**

(57) A device (10) for connecting two portions of a cremone-bolt mechanism (14, 15) related to parts (12, 13) having a different diameter of the leaf (11) of a tilting window of the porthole type, comprising: a flat guide (21) to be applied astride the two parts (12, 13) having a different diameter of the frame of the leaf (11), a longitudinal lamina (22), which can slide within the flat guide (21) and also runs substantially astride the two parts (12, 13) having a different diameter of the frame of the leaf (11),

means (26) for connecting the longitudinal lamina (22) to the two mechanism portions (14, 15) of the two parts (12, 13) of the leaf (11). The flat guide (21) is formed by at least three separate portions (23, 24, 25), respectively a first portion (23) to be fixed to a first one (12) of the two parts (12, 13) having a different diameter of the frame of the leaf (11), a second portion (24) to be fixed to the second (13) of the two parts (12, 13), and a third inclined portion (25) for connecting the first and second portions (23, 24).



Description

[0001] The present invention relates to a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type.

[0002] The present invention also relates to a cremone-bolt mechanism for tilting windows of the porthole type.

[0003] As is known, tilting windows are constituted by a casing and by a leaf, which is pivoted to the casing by means of a pair of hinges having a horizontal axis which are arranged at the horizontal centerline of the leaf.

[0004] The leaf is closed and opened by means of a handle which is connected to the closure elements by means of a so-called cremone-bolt mechanism.

[0005] In particular, the leaves of tilting windows of the porthole type have a frame which is constituted by an upper part, which is contoured like a circular arc which spans 180°, and a lower part, which is also shaped like a circular arc which spans 180° and is connected to the upper part.

[0006] The upper part has a larger diameter than the lower part and therefore, at the horizontal centerline of the leaf there is a step which constitutes the diameter variation.

[0007] Currently, cremone-bolt mechanisms used on the leaves of tilting windows of the porthole type are constituted by two separate circular arc-like portions, which are mutually connected and are arranged in circular arc-like slots formed on the side of the frame of the leaf.

[0008] Each portion of the mechanism is constituted by a base which is elongated and shaped substantially like a circular arc and is fixed with respect to the corresponding part of the leaf; such elongated base acts as a guide for a longitudinally elongated body which is arranged between the frame of the leaf and the base.

[0009] The corresponding ends of the longitudinally elongated bodies of the two portions of the mechanism are connected by a pawl, so that the movement of the lower longitudinal body (operated by means of the handle) is matched by a movement of the upper longitudinal body, with a movement of the opening and closure elements.

[0010] In particular, the slot in which the mechanism portion related to the lower part of the leaf is arranged lies beyond the region of diameter variation between the upper and lower part of the leaf and in practice enters the upper part of the leaf.

[0011] This is needed to "skip" the region related to the diameter variation in which the hinge for connecting the leaf to the frame is provided.

[0012] The part of the slot related to the lower mechanism portion which enters the upper leaf portion follows the circular arc-like curvature of the slot formed in the lower part.

[0013] This type of connection between the lower portion and the upper portion of the mechanism is mechan-

ically simple but has problems in terms of construction.

[0014] It is in fact not easy to provide, with current methods for manufacturing leaf frames, the part of the slot for accommodating the lower portion of the mechanism which enters the first part of the frame of the leaf; in particular, it is complicated to provide the curvature of said slot portion, which as mentioned follows with the same radius of curvature the slot formed in the lower part of the leaf.

[0015] The aim of the present invention is to provide a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type, which solves the drawback noted in the production of known types of tilting window of the porthole type.

[0016] Within this aim, an object of the present invention is to provide a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type which allows to avoid complicated machining processes on the leaf for its application.

[0017] Another object of the present invention is to provide a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type which is constructively simple and can be adapted easily to leaves having different dimensions.

[0018] Another object of the present invention is to provide a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type which can be manufactured with known systems and technologies.

[0019] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window of the porthole type, characterized in that it comprises:

- a flat guide to be applied astride the two parts having a different diameter of the frame of the leaf,
- a longitudinal lamina, which can slide within said guide and also runs substantially astride the two parts having a different diameter of the frame of the leaf,
- two elements which are fixed to said lamina and are adapted to connect said lamina to the two mechanism portions of said two parts having a different diameter of the frame of the leaf,

said flat guide being formed by three separate portions, respectively a first portion to be fixed to a first one of said parts having a different diameter of the frame of the leaf, a second portion to be fixed to the second of said parts having a different diameter of the frame of the leaf, and a third inclined portion for connecting said first and second portions.

[0020] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic front view of the leaf of a tilting window of the porthole type, with a device according to the invention applied thereto;

Figure 2 is a sectional front view of the portion of the tilting window of the porthole type to which a device according to the invention is applied;

Figure 3 is a sectional side view of a portion of a cremone-bolt mechanism associated with a portion of the device according to the invention.

[0021] It is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0022] With reference to the figures, a device for connecting two portions of a cremone-bolt mechanism related to parts having a different diameter of the leaf of a tilting window of the porthole type according to the invention is generally designated by the reference numeral 10.

[0023] In the figures, a leaf of the window is generally designated by the reference numeral 11, while two parts having a different diameter, respectively a first upper part and a second lower part, are designated by the reference numerals 12 and 13.

[0024] A mechanism portion associated with the first part 12 of the leaf, termed first portion, is designated by the reference numeral 14, while a mechanism portion associated with the second part 13 of the leaf is designated by the reference numeral 15.

[0025] As clearly shown in Figure 2, the first mechanism portion 14 is constituted by a first elongated base 16, which is substantially shaped like a circular arc which spans 180° and is fixed with respect to the first part 12 of the leaf 11.

[0026] The first elongated base 16 acts as a guide for a first longitudinally elongated body 17, which is arranged between the frame of the leaf and the first base 16.

[0027] The first longitudinally elongated body 17, moved by the device 10, in turn moves the closure elements, (not shown in the figures) related to the first part 12 of the leaf (in this case, the closure elements related to the upper part of the tilting window).

[0028] Likewise, the second mechanism portion 15 is composed of a second elongated base 18, which is contoured substantially like a circular arc which spans 180° and is fixed with respect to the first part 12 of the leaf 11.

[0029] The second elongated base 18 acts as a guide for a second longitudinally elongated body 19, which is arranged between the frame of the leaf and the second base 18.

[0030] The second longitudinally elongated body 19 is moved by a handle 20 for opening/closing the leaf 11 and is connected to the device 10.

[0031] The device 10 for connecting the two cremone-bolt mechanism portions 14 and 15 comprises a flat guide 21, to be applied astride the two parts 12 and 13 having different diameters of the frame of the leaf 11, and a longitudinal lamina 22, which can slide within the flat guide 21 and also substantially straddles the two parts 12 and 13.

[0032] The flat guide 21 is formed by three separate portions, respectively a first portion 23 to be fixed to the first part 12 of the frame of the leaf 11, a second portion 24 to be fixed to the second part 13 of the frame of the leaf, and a third inclined portion 25 for connecting the first and second portions 23 and 24.

[0033] The second portion 24 of the guide 21 runs substantially from the region of diameter variation of the leaf, designated by the reference letter D, toward the second part 13 of the leaf 11.

[0034] From the region D, the part of the leaf that accommodates the device 10 continues in a straight line until it blends, at a certain height, with the circular arc of the first part 12 on which the first mechanism portion 14 lies.

[0035] In the region comprised between the region of diameter variation D and the beginning of the circular arc on which the first mechanism portion 14 lies, termed region E, there is the third inclined portion 25 of the guide 21.

[0036] As can be seen from Figure 2, the third portion 25 does not touch the leaf in the region E; it is therefore evident that the extension of the region E can be substantially the most convenient in terms of production (in this embodiment, said region is provided by a milling constituted by a straight portion and a curve for blending with the first part 12 of the leaf on which the first portion 23 of the longitudinal guide 21 is arranged).

[0037] The device 10 comprises connection means 26 for connecting the longitudinal lamina 22 to the two mechanism portions 14 and 15, which are constituted by two elements 26a which are fixed at the lamina 22 and connect it respectively to the first mechanism portion 14 and the second mechanism portion 15.

[0038] In particular, each element 26a has two mutually opposite toothed sides 27, between which the respective longitudinal body 17 or 19 is arranged; the edges of said body are shaped complementarily with respect to teeth of the mutually opposite sides 27 of the element 26a (see Figure 3, which shows a portion of the side of the leaf, with the first or second portion 23 or 24 of the guide 21 applied thereto and with the respective longitudinal body 17 or 19 associated therewith).

[0039] The longitudinal guide 21 is fixed to the frame for example by way of screws 28 which pass through respective bushes 29 provided on the first and second portions 23 and 24 of the longitudinal guide 21.

[0040] A block 30 for locking the ends of the elongated bases 16 and 18, which end at the diameter variation region D of the leaf, is fixed on the second portion 24.

[0041] Both the first base 16 and the second base 18

in fact tend to flex toward the outside of the leaf; the block 30 therefore has a first containment abutment 31 for the end of the first base 16 and a second containment abutment 32 for the end of the second base 18.

[0042] In particular, the first containment abutment 31 is arranged at the outer end of the block 30, while the second containment abutment 32 is arranged at the inner end of the block 30.

[0043] In particular, both the first containment abutment 31 and the second containment abutment 32 have an L-shaped profile and are rigidly coupled to a side of the block 30 which is substantially perpendicular to the second portion 24 of the longitudinal guide 21.

[0044] One side of the L-shaped contour of the containment abutments is shaped complementarily with respect to a dovetail guide 33 (the dovetail shape is not shown in the figures), which is formed on the side of the block 30; in practice, the containment abutments are fitted on the dovetail guide 33.

[0045] Constructively, the second containment abutment 32 is fitted first on the dovetail guide 33 and then, in series thereto, the first containment abutment 31 is inserted and rests on the second containment abutment 32.

[0046] Therefore, the first containment abutment 31 is locked on the block 30 by means of a screw 34, thus also preventing the second containment abutment 31 from moving, since it is locked between the stroke limit of the dovetail guide 33 and the first containment abutment 31.

[0047] The longitudinal guide 21 is made of a flexible metallic material, so as to adapt easily to the bends of the frame of the leaf.

[0048] The lamina 22 also is made of a highly flexible material, so that it can deform elastically while sliding within the longitudinal guide 21 (which, as mentioned, has three separate portions which are not aligned and therefore two blended angular discontinuities).

[0049] The lamina 22 is continuous and the screws 28 related to the locking of the longitudinal guide part 21 are arranged so as to pass also through slots (not shown in the figures) formed on the lamina 22, so as to not hinder its movement.

[0050] The operation of the invention is as follows.

[0051] The opening or closing movement of the handle 20 moves the second mechanism portion 15 and therefore moves the lamina 22, which is connected by means of the element 26a to the second longitudinally elongated body 19 of the first mechanism portion 15.

[0052] Consequently, the first longitudinally elongated body 17 of the first mechanism portion 14 also is moved, thanks to the connection by means of the other element 26a, opening the opening or closure elements of the leaf.

[0053] In practice it has been found that the invention thus described solves the problems noted in known types of tilting window of the porthole type; in particular, the present invention provides a device for connecting two portions of a cremone-bolt mechanism related to parts having different diameters of the leaf of a tilting window

of the porthole type which allows to provide the part of the slot for accommodating the lower portion of the mechanism which enters the first part of the frame of the leaf without said slot part following the curvature of the slot formed in the lower part of the leaf.

[0054] The present invention in fact allows to connect the two mechanism portions astride the diameter variation region D and therefore to "skip" the hinge of the window without having to provide a particular machining on the frame, since the device has two portions which are connected to the circular arc-like curved portions upstream and downstream of the diameter variation region D and an intermediate portion which connects them and can be shaped substantially according to requirements, without necessarily having an angular continuity with the two portions and therefore without the need for a particular shape of the seat of said intermediate portion; said intermediate portion can thus be provided for example by means of a simple straight milling.

[0055] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0056] 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.

[0057] The disclosures in Italian Patent Application No. PD2006A000083 from which this application claims priority are incorporated herein by reference.

[0058] 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 device (10) for connecting two portions of a cremone-bolt mechanism (14, 15) related to parts (12, 13) having a different diameter of the leaf (11) of a tilting window of the porthole type, **characterized in that** it comprises:

- a flat guide (21) to be applied astride the two parts (12, 13) having a different diameter of the frame of the leaf (11),
- a longitudinal lamina (22), which can slide within said flat guide (21) and also runs substantially astride the two parts (12, 13) having a different diameter of the frame of the leaf (11),
- means (26) for connecting said longitudinal lamina (22) to the two mechanism portions (14, 15) of said two parts (12, 13) having a different

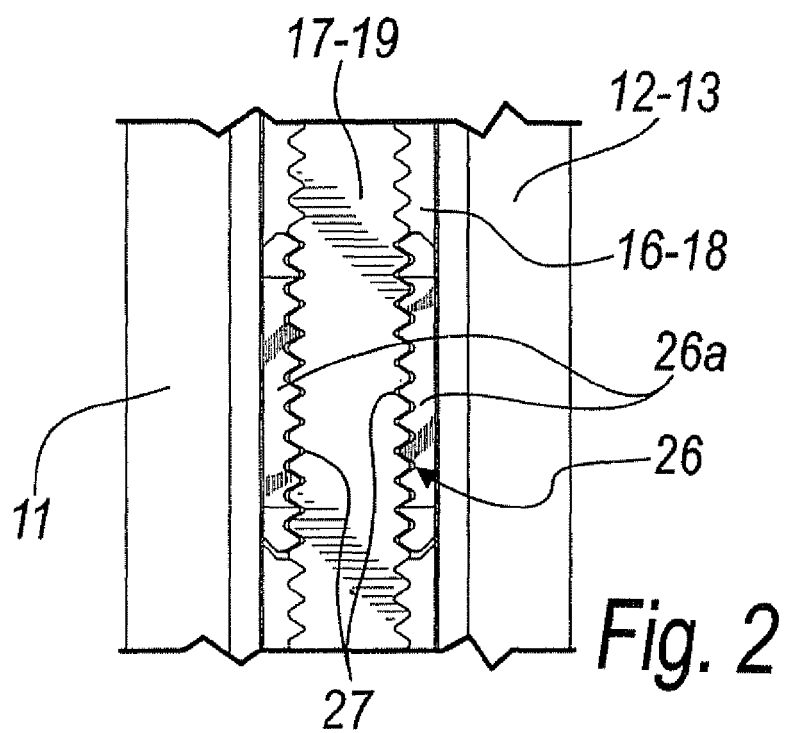
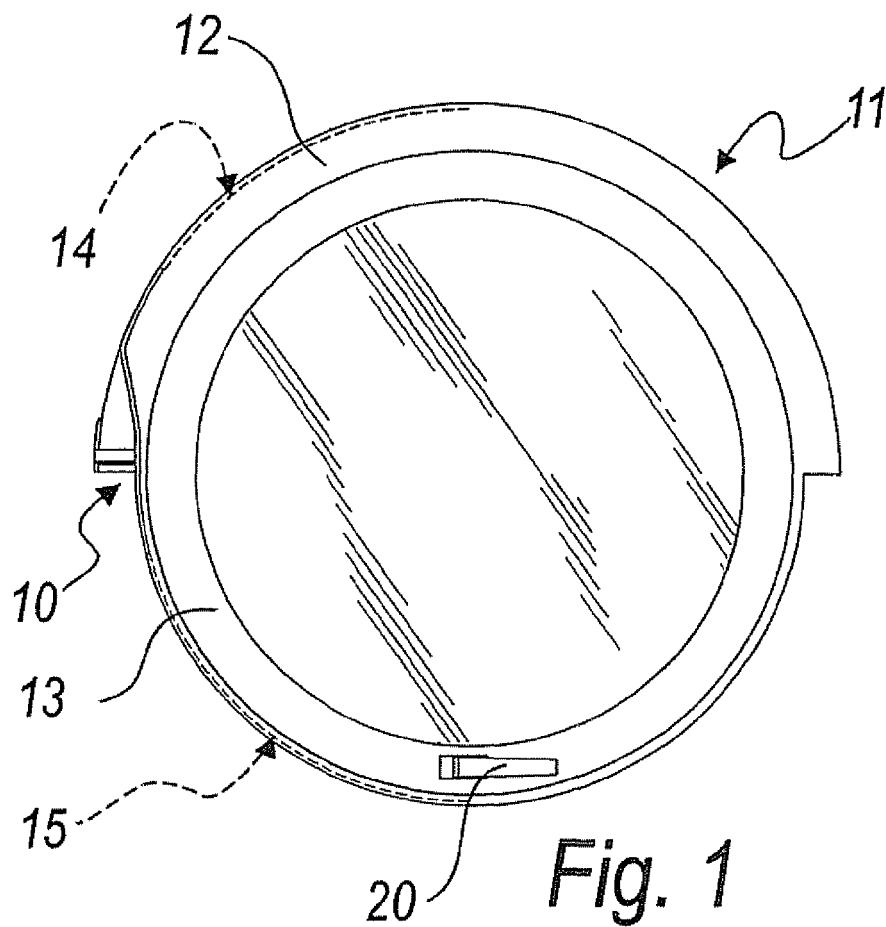
diameter of the frame of the leaf (11),

said flat guide (21) being formed by at least three separate portions (23, 24, 25), respectively a first portion (23) to be fixed to the first one (12) of said parts (12, 13) having a different diameter of the frame of the leaf (11), a second portion (24) to be fixed to the second (13) of said parts (12, 13) having a different diameter of the frame of the leaf (11), and a third inclined portion (25) for connecting said first and second portions (23, 24).

2. The device according to claim 1, **characterized in that** said means (26) for connecting said longitudinal lamina (22) to the two mechanism portions (14, 15) comprise two elements (26a) which are fixed at said longitudinal lamina (22) and connect it (22) respectively to the two mechanism portions (14, 15).
3. The device according to claim 2, **characterized in that** each of said elements (26a) has two mutually opposite toothed sides (27), between which there is a respective longitudinal body (17, 19) of a corresponding mechanism portion (14, 15), said body (17, 19) having its edges shaped complementarily with respect to the teeth of said mutually opposite sides (27) of said element (26a).
4. The device according to one or more of the preceding claims, **characterized in that** it comprises a block (30) for locking the ends of the elongated bases (16, 18), which are the fixed components of the two mechanism portions (14, 15), which end at the diameter variation region (D) of the leaf.
5. The device according to claim 4, **characterized in that** said block (30) is fixed on said second portion (24) and has a first containment abutment (31) for the end of the first elongated base (16) and a second containment abutment (32) for the end of the second elongated base (18).
6. The device according to claim 5, **characterized in that** both the first containment abutment (31) and the second containment abutment (32) have an L-shaped profile and are rigidly coupled to a side of said block (30) which is substantially perpendicular to said second portion (24) of the longitudinal guide (21), said first containment abutment (31) being arranged at the outer end of said block (30), while said second containment abutment (32) is arranged at the inner end of said block (30).
7. The device according to claim 6, **characterized in that** the side of the L-shaped contour of said containment abutments (31, 32) is shaped complementarily with respect to a dovetail guide (33) which is formed on said side of said block (30), said contain-

ment abutments being fitted on said dovetail guide (33), said first containment abutment (31) being locked on said block (30) by means of a screw (34), said second containment abutment (31) being locked between the stroke limit of said dovetail guide (33) and said first containment abutment (31).

8. The device according to one or more of the preceding claims, **characterized in that** said longitudinal guide (21) is fixed to the frame of the leaf (11) by way of screws (28) which are arranged so as to pass through respective bushes (29) which are provided in said first and second portions (23, 24) of said longitudinal guide (21).
9. A cremone-bolt mechanism for tilting windows of the porthole type, of the type comprising two cremone-bolt mechanism portions (14, 15) related to parts (12, 13) having a different diameter of the leaf (11) of the window, **characterized in that** it comprises a device (10) according to one or more of the preceding claims.



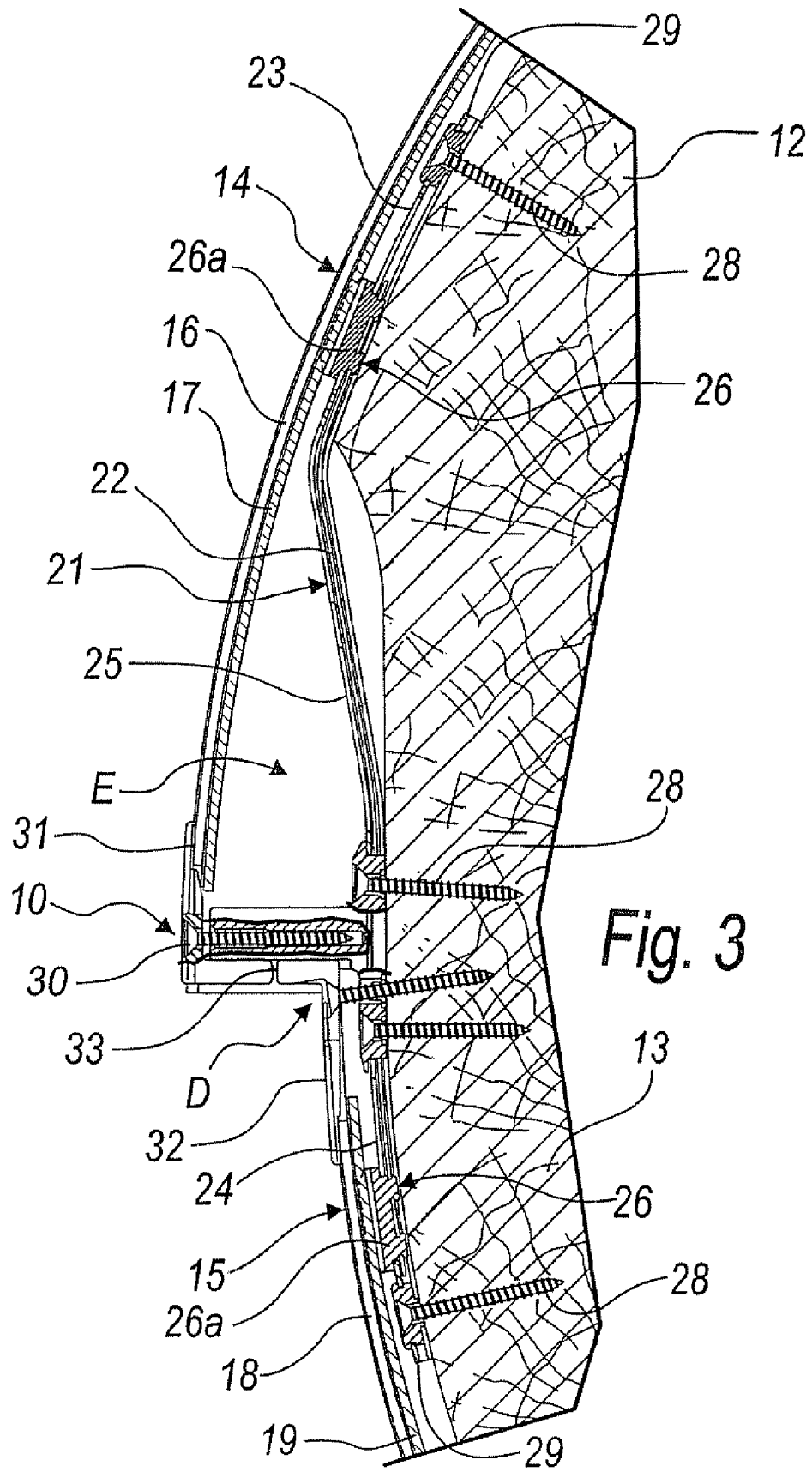


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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