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(54) EXPANDING CORNER JOINT USED FOR FASTENING TWO PROFILES

(57) A corner joint (1) for fastening two profiles comprises: two wings (3), each of them comprising an upper element (E1) and a lower element (E2), and adjustment means (5) to adjust the distance between the upper elements (E1) and the lower elements (E2) of the two wings (3); the adjustment means (5) comprise: a threaded hole (51) obtained on the upper element (E1) of at least one of the two wings (3); a housing (52) obtained on the lower element (E2) of at least one of the two wings (3) and aligned with the threaded hole (51); a nut (53) screwed into said threaded hole (51) and comprising a tip (54) disposed in the housing (52); the thread of the nut (53) is engaged, in correspondence of the tip (54), in a removable thread (55a) obtained on the lateral wall (55) of the housing (52).

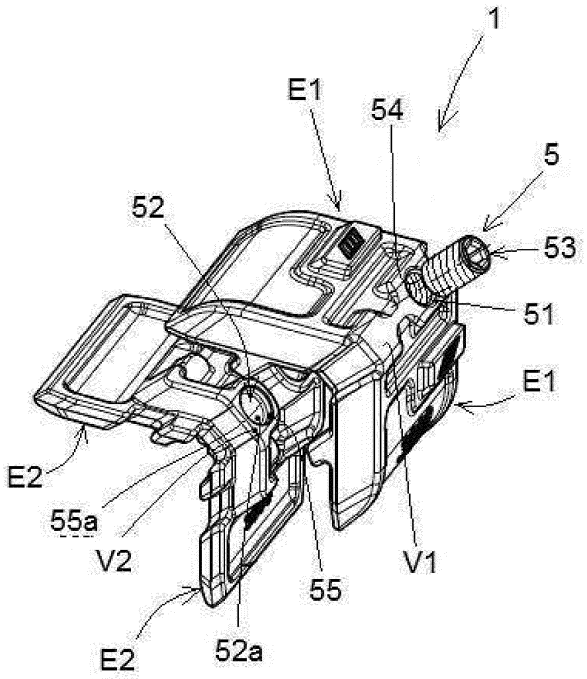

FIG. 5

EP 3 354 838 A1

Description

[0001] The present patent application for industrial invention relates to an expanding corner joint used for fastening two profiles. The reference sector is the one of windows and doors, in particular the sector of window frames obtained by joining profiles in frame-like configuration.

[0002] With reference to Figs. 1 and 2, a corner joint according to the prior art is described, which is generally indicated with reference numeral 100.

[0003] The corner joint (100) is suitable for being inserted inside two profiles in order to join the two profiles. Each profile comprises a longitudinal axis, an external wall, an internal wall, and a pair of lateral walls. Each profile comprises a longitudinal channel defined by said walls. The longitudinal channel of each profile is in communication with the longitudinal channel of the other profile.

[0004] It must be noted that the two profiles comprise a hole that can be accessed from the exterior and is obtained in the vertex of the two profiles, i.e. in the junction between the two profiles. Such a hole provides access to the longitudinal channel of the two profiles, after joining the two profiles.

[0005] The corner joint (100) comprises two wings and a central portion that joins the two wings. The central portion is suitable for being disposed in the vertex between the two profiles. In particular, the central portion of the corner joint (100) comprises a raised edge and/or a tooth that is suitable for abutting against an internal surface of the external surface of the profiles.

[0006] Each wing comprises an upper element (103) that is inserted in the longitudinal channel of one of the two profiles, and a lower element (104), that is connected to one of the upper elements (103).

[0007] The upper elements (103) of the two wings are made in one piece with elastic material. The upper elements (103 of the two wings (3) are disposed at right angle in such a way to form a vertex (V1). Moreover, the upper element (103) of each wing comprises a longitudinal axis and a free end (133) that is inclined relative to the longitudinal axis of the upper elements (103).

[0008] The lower elements (104) of the two wings are made in one piece and disposed at right angle, in such a way to form a vertex (V2). Moreover, the lower element (104) of each wing comprises an ending edge (144) and is shorter than the upper element (103), in such a way that the free end (133) of the upper element (103) is fastened with the ending edge (144) of the lower element (104), the vertex (V1) of the upper elements (103) of the two wings being disposed in the vertex (V2) of the lower elements (104). When the upper elements (103) of the two wings are fastened to the lower elements (104), the corner joint (100) is in a contracted position, as shown in Fig. 2. Because of such a fastening, the upper elements (103) of the two wings can be fixed to the lower elements (104), in such a way to transport and move the corner joint (100) without separating the upper elements (103) from the lower elements (104) of the two wings. Moreover, because of the fastening of the upper elements (103) to the lower elements (104) of the two wings, the wings can be disposed in the position in which they are to be mounted in the profiles. In this way, the corner joint (100) is ready to be mounted in the profiles.

[0009] With reference to Figs. 1 and 2, the corner joint (100) is provided with adjustment means (105) that comprise a threaded hole (151) obtained in the vertex (V1) of the upper elements (103) of the two wings.

[0010] The adjustment means (105) also comprise a housing (152) that is obtained in the vertex (V2) of the lower elements (104). The housing (152) is aligned with the threaded hole (151) when the corner joint (100) is in contracted position.

[0011] The adjustment means (105) comprise a nut (153) that is screwed in the threaded hole (151). The nut (153) comprises a tip (154) abutting against the bottom wall of the housing (152). The nut (153) slidingly moves the upper elements (103) relative to the lower elements (104) of the two wings along a parallel direction to the axis of the threaded hole (151).

[0012] During the mounting step, the corner joint (100) in contracted position is inserted inside the longitudinal channels of the two profiles in order to fasten the two profiles. When the corner joint is in contracted position, the two wings (103,104) of the corner joint (100) have lower dimensions than the width of the longitudinal channel of the profiles.

[0013] A tool is inserted in the hole of the two profiles in such a way to screw the nut (153) in the threaded hole (51). The nut (153) turns in idle in the housing (162), its tip (152) abutting against the bottom wall of the housing (152). Consequently, the screwing of the nut (153) in the threaded hole (151) makes the corner joint (100) go from the contracted position to an expanded position, meaning that the upper elements (103) of the two wings are moved away from the lower elements (104) until the upper elements (103) and the lower elements (104) of the two wings abut against the walls that define the longitudinal channels of the profiles.

[0014] Advantageously, each profile comprises a slot and the upper elements (103) comprise a tooth (137) that is slidingly mounted in the slot of the profile, in such a way to fasten the profiles when the corner joint (100) goes from its contracted position to its expanded position.

[0015] Although it is capable of fastening the two profiles, such a corner joint (100) is impaired by a drawback caused by the fact that the upper elements of the two wings are made of elastic material. In fact, the use of an elastic material determines the high purchasing cost and the high production cost of the upper elements of the two wings. As a matter of fact, the working and the modeling of such an elastic material requires a high accuracy, specific tools and specialized workers in order to work the material correctly and obtain the upper elements of the two wings of the corner joint.

[0016] In order to solve such an inconvenience, it was decided that also the upper elements (103) are made of a non-elastic material. In such a case, the corner joint (100) is impaired by the fact that the upper elements (103) cannot be fastened to the lower elements (104) because the ends (133) of the upper elements (103) are not elastic. Consequently, the upper elements (103) of the two wings are separated from the lower elements (104) during the transportation step and the upper elements (103) need to be realigned with the lower elements (104) during the assembly step, in order to correctly move the upper elements (103) away from the lower elements (104).

[0017] Moreover, in order to guarantee a stable firm connection between the profiles, when the corner joint (100) has fastened the profiles, adhesive must be introduced inside the longitudinal channels of the profiles, in such a way that the adhesive is disposed in the vertex between the two profiles to cause the adhesion of the two profiles. The adhesive is inserted in the longitudinal channels of the profiles through the hole of the profiles.

[0018] The corner joints of known type are impaired by the fact that they are not able to guide and convey the adhesive in such a way to distribute the adhesive along the vertex between the two profiles. In fact, the adhesive should be disposed around the central portion of the corner joint in the vertex between two consecutive adjacent profiles. On the contrary, the adhesive is stopped by the raised edge and/or the tooth of the central portion of the corner joint, moving from the central portion towards the free ends of the wings of the corner joint. In such a case, the adhesive is not disposed in the vertex of the profiles.

[0019] The purpose of the present invention is to remedy the drawbacks of the prior art, by devising a corner joint wherein the upper elements and the lower elements of the two wings are made of a non-elastic material and joined during the transportation step.

[0020] Another purpose is to devise an easy rapid mounting process of the corner joint that is suitable for being stored, transported and mounted inside the profiles.

[0021] Another purpose is to devise an assembly that comprises a pair of profiles and a corner joint that ensures the correct adhesion of the two profiles in the vertex between the two profiles.

[0022] A corner joint according to the invention is suitable for being disposed inside the longitudinal channels of two profiles in order to fasten the two profiles. The corner joint comprises two wings, each of them suitable for being disposed inside the longitudinal channel of one of the two sections; each wing comprises an upper element and a lower element that is connected to the upper element.

[0023] The corner joint comprises adjustment means to move the upper element of each wing, in such a way to adjust the distance between the upper elements and the lower elements of the two wings. The adjustment means comprise a threaded hole that is obtained on the upper element of at least one of the two wings, and comprise a housing that is obtained on the lower element of at least one of the two wings and aligned with the threaded hole. The housing comprises a lateral wall.

[0024] The adjustment means comprise a nut that is screwed in the threaded hole and comprises a tip disposed in the housing.

[0025] The peculiarity of the corner joint according to the invention consists in the fact that the thread of the nut is engaged, in correspondence of the tip, in a removable thread that is obtained on the lateral wall of the housing.

[0026] The advantages of the corner joint according to the invention are evident because the provision of a removable thread in the housing permits to couple the upper elements and of the lower elements of the two wings even if the upper elements are not made of elastic material.

[0027] In view of the above, the corner joint can be moved without separating the upper elements of the two wings from the lower elements.

[0028] For the sake of clarity, the description of the expanding corner joint according to the invention continues with reference to the attached drawings, which have a merely illustrative, not limiting value, wherein:

- Fig. 1 is an exploded axonometric view of a corner joint according to the prior art;
- Fig. 2 is an axonometric view of the corner joint of Fig. 1, in assembled condition;
- Fig. 3 is a side view of an assembly according to the invention;
- Fig. 4 is a sectional view of the assembly according to the invention of Fig. 3, taken along the plane IV-IV;
- Fig. 4A is an enlarged view of the detail enclosed in the circle A of Fig. 4;
- Fig. 5 is an exploded axonometric view of the corner joint according to the invention;
- Fig. 6 is a side view of the corner joint of Fig. 5;
- Fig. 7 is a sectional view of the corner joint according to the invention, taken along the plane VII-VII of Fig. 6;
- Fig. 7A is an enlarged view of the detail enclosed in the circle A of Fig. 7;
- Fig. 8 is an axonometric view of the corner joint of Fig. 5, in assembled condition;
- Fig. 9 is a side view of the corner joint of Fig. 8;
- Fig. 10 is a sectional view of the corner joint of Fig. 9, taken along the plane X-X of Fig. 9;
- Fig. 11 is an axonometric bottom view of the corner joint of Fig. 8.
- Fig. 12 is an axonometric view of the assembly according to the invention;
- Fig. 13 is a sectional view of the assembly of Fig. 12, taken along a plane inclined at 45° and passing through the axis XIII-XIII of Fig. 12.

[0029] With reference to Figs. 3 and 4, an assembly according to the invention is disclosed, which is generally

indicated with reference numeral (G).

[0030] The assembly (G) comprises two quadrangular profiles (2) that are disposed at right angle in such a way to form a vertex (V3).

[0031] Each profile (2) comprises a longitudinal axis (X), an external wall (20), an internal wall (21), and a pair of lateral walls (23).

[0032] Moreover, each profile (2) comprises a longitudinal channel (22) that is defined by the walls (20, 21, 23) and is in communication with the longitudinal channel (22) of the other profile (2), as shown in Fig. 4.

[0033] The lateral walls (23) of each profile (2) are disposed in parallel position and coplanar to the lateral walls (23) of the other profile (2).

[0034] Furthermore, as shown in Fig. 4A, the external wall (20) of each section (2) comprises a slot (25) that ends in the longitudinal channel (22). Each slot (25) comprises a first end (25a) in proximal position relative to the vertex (V3) of the profiles (2), and a second end (25b) in distal position relative to the vertex (V3) of the sections (2).

[0035] It must be noted that each profile (2) comprises a semicircular recess obtained in the vertex (V3) between the two profiles (2). The two semicircular recesses of the two profiles (2) form a hole (24) that is used to introduce a tool for fixing the corner joint in operating position. Moreover, the hole (24) is used to introduce the adhesive in the longitudinal channel (22) of the profiles after joining the profiles (2).

[0036] With reference to Figs. 4 to 7, the assembly (G) comprises a corner joint (1) that is disposed inside longitudinal channels (22) of the profiles (2) and connects the two profiles (2).

[0037] The corner joint (1) comprises two wings (3), each of them comprising an upper element (E1) and a lower element (E2).

[0038] The upper element (E1) of each wing (3) is disposed inside the longitudinal channel (22) of one of the two profiles (2). The upper elements (E1) of the two wings (3) are disposed at right angle, in such a way to form a vertex (V1). Advantageously, the upper elements (E1) of the two wings (3) are made in one piece.

[0039] The lower element (E2) of each wing (3) is disposed inside the longitudinal channel (22) of one of the two profiles (2) and is connected to one of the upper elements (E1). The lower elements (E2) of the two wings (3) are disposed at right angle, in such a way to form a vertex (V2). Advantageously, the lower elements (E2) of the two wings (3) are made in one piece.

[0040] The upper elements (E1) and the lower elements (E2) of the two wings (3) are made of a non-elastic material.

[0041] As shown in Figs. 4 and 6, the lower elements (E2) of the two wings (3) comprise a guide surface (40) that is configured in such a way to guide the sliding of the upper elements (E1) relative to the lower elements (E2). The upper elements (E1) of the two wings (3) comprise a counter-surface (35) that is disposed in contact with the guide surface (40) in such a way to cooperate with the guide surface (40) during the sliding of the upper elements (E1) relative to the lower elements (E2).

[0042] Although it is not shown in the attached figures, according to an alternative embodiment, the lower element (E2) of only one of the two wings (3) comprises a guide surface (40) and the upper element (E1) of only one of the two wings (3) comprises a counter-surface (35) that cooperates with the guide surface (40) of the lower element (E2).

[0043] With reference to Fig. 4A, the upper element (E1) of each wing (3) comprises a tooth (37) that is slidingly mounted in the slot (25) of one of the two profiles (2), in such a way that the tooth (37) can slide from the second end (25b) of the slot (25) to the first end (25a) of the slot (25).

[0044] With reference to Figs. 5, 7 and 7A, the corner joint (1) comprises adjustment means (5) to move the upper elements (E1) of the two wings (3) in such a way to adjust the distance between the upper elements (E1) and the lower elements (E2) of the two wings (3).

[0045] As shown in Figs. 5 and 7A, the adjustment means (5) comprise a threaded hole (51) that is obtained in the vertex (V1) of the upper elements (E1) of the two wings (3) and is aligned with the hole (24) of the profiles (2).

[0046] The adjustment means (5) comprise a housing (52) that is obtained in the vertex (V2) of the lower elements (E2) of the two wings (3) and aligned with the threaded hole (51).

[0047] Although it is not shown in the enclosed figures, according to an alternative embodiment, the threaded hole (51) is obtained on the upper element (E1) of one of the two wings (3) and the housing (52) is obtained on the lower element (E2) of one of the two wings (3) and aligned with the threaded hole (51).

[0048] The housing (52) comprises a lateral wall (55) and a flat bottom wall (52a).

[0049] The adjustment means (5) comprise a threaded nut (53). The nut (53) is screwed in the threaded hole (51) and comprises a flat tip (54) that is disposed in the housing (52), in contact with the bottom wall (52a) of the housing (52).

[0050] The thread of the nut (53) is engaged, in correspondence of the tip (54), in a removable thread (55a) that is obtained on the lateral wall (55) of the housing (52).

[0051] As a matter of fact, the tip (54) of the nut (53) is configured in such a way to be screwed in the housing (52), which is tapped by the nut (53). By creating the removable thread (55a), the nut (52) connects the upper elements (E1) with the lower elements (E2) of the two wings. In view of the above, the corner joint (1) can be transported and moved, without causing the separation of the upper elements (E1) from the lower elements (E2).

[0052] Moreover, the tip (54) of the nut (53) is configured in such a way to be screwed in the housing (52) until its tip (54) is stopped against the bottom wall (52a) of the housing (52). By rotating the nut (53), the remov-

able thread (55a) of the lateral wall (55) is removed. In view of the above, the nut (53) turns in idle in the housing (52) and is screwed in the threaded hole (51) of the upper elements (E1) of the two wings, moving the upper elements (E1) away from the lower elements (E2).

[0053] In fact, it must be noted that the lower elements (E2) of the two wings (3) are made of a softer material compared to the material used for the nut (53). Consequently, the thread of the nut (53) breaks the removable thread (55a).

[0054] Alternatively, the removable thread (55a) is made during the production step of the corner joint (1). The lower elements (E2) and the nut (53) are made with materials having the same softness, but the thread of the nut (53) is more resistant than the removable thread (55a), in such a way to break the removable thread (55a).

[0055] With reference to Figs. 8, 9 and 13, each wing (3) of the corner joint (1) comprises an external surface (30), which is suitable for abutting against an internal surface of the external wall (20) that defines the longitudinal channel (22) of the profile (2). The external surface (30) of each wing (3) forms an obtuse angle of 270° with the external surface (30) of the other wing (3).

[0056] With reference to Figs. 9, 11 and 13, each wing (3) of the corner joint (1) also comprises an internal surface (31), which is suitable for abutting against an internal surface of the internal wall (21) that defines the longitudinal channel (22) of the profile (2). The internal surface (31) of each wing (3) forms a right angle with the internal surface (31) of the other wing (3).

[0057] With reference to Figs. 8 and 11, each wing (3) of the corner joint (1) comprises two lateral surfaces (32) that are disposed in parallel position and are suitable for abutting against an internal surface of the lateral walls (23) that define the longitudinal channel (22) of the profile (2). The two lateral surfaces (32) of each wing (3) are disposed in coplanar position relative to the lateral surfaces (32) of the other wing (3).

[0058] With reference to Figs. 8, 9, 11 and 13, the corner joint (1) comprises a central portion (6) that connects the two wings (3) and is disposed in the vertex (V3) of the profiles (2). Advantageously, the central portion (6) comprises an upper element, which is made in one piece with the upper elements (E1) of the two wings (3), and a lower element, which is made in one piece with the lower elements (E1) of the two wings (3).

[0059] With reference to Figs. 8, 10 and 13, the central portion (6) comprises a flat external surface (60) that joins the external surfaces (30) of the two wings (3).

[0060] The external surface (60) of the central portion (6) is disposed in correspondence of the hole (24) of the profiles (2) and has a distance higher than zero relative to the internal surfaces of the external walls (20) of the profiles (2), in such a way to introduce the adhesive in the longitudinal channels (22) of the profiles (2).

[0061] The central portion (6) comprises two lateral surfaces (62). Each lateral surface (62) joins the lateral surfaces (32) of the two wings (3) and comprises a groove (63), which is provided with a bottom wall (64) joined to the external surface (60) of the central portion (6).

[0062] In particular, the external surface (60) of the central portion (6) and the grooves (63) generate a "U"-shaped primary cavity (10) with the internal surface of the external wall (20) and of the lateral walls (23) of the profiles (2), which is suitable for housing an adhesive that is introduced through the hole (24) of the profiles (2). Said "U-shaped" primary cavity (10) comprises a central portion, which is disposed in correspondence of the external surface (60) of the central portion (6), and a pair of lateral sections, each of them being disposed in correspondence of the lateral surfaces (62) of the central portion (6).

[0063] Therefore, a fixed route is created for the adhesive because the external surface (60) of the central portion (6) is devoid of teeth and/or raised edges, and because the grooves (63) are joined to the external surface (60) of the central portion (6). In view of the above, the adhesive can be introduced in the grooves (63) from the external surface of the central portion, without sliding along the wings (3) of the corner joint (1). In this way, the adhesive is disposed in the vertex (V3) between the profiles (2).

[0064] The central portion (6) also comprises an internal surface (61) that joins the internal surfaces (31) of the two wings (3). The internal surface (61) comprises a centering notch (65) that houses the ending edges of the profiles (2) in abutting position.

[0065] In particular, as shown in Fig. 11, the centering notch (65) comprises two narrow portions (65a) that end on the bottom walls (64) of the grooves (63), and one enlarged portion (65b) that is disposed between the two narrow portions (65a). The width of the enlarged portion (65b) is higher than the width of the narrow portions (65a). The narrow portions (65a) act as guide for disposing the ending edges of the profiles (2) in abutting position. The enlarged portion (65b) houses the adhesive, in such a way to make the corner joint (1) adhere to the profiles (2).

[0066] With reference to Fig. 4, the internal surface (61) of the central portion (6) also comprises a pair of inlets (66) among which the centering notch (65) is disposed. Each inlet (66) comprises a bottom wall (67) that is joined with the bottom wall (64) of the grooves (63). The purpose of the inlets (66) is to let the adhesive go towards the sides of the centering notch (65). In fact, the centering notch (65) houses the ending edges of the profiles (2), and therefore is not a sufficient passage for the adhesive.

[0067] The bottom wall (67) of the inlets (66) generates a secondary cavity (11) with the internal surface of the internal wall (21) of the profiles (2), which is suitable for housing the adhesive, as shown in Fig. 14. The secondary cavity (11) joins the grooves (63) of the "U-shaped" primary cavity (10), in such a way that the adhesive is disposed around the central portion (6) along an annular trajectory.

[0068] The description continues with reference to the process for transporting and mounting the corner joint (1) inside the profiles (2) and for making the two profiles

(2) adhere.

[0069] The upper elements (E1) and the lower elements (E2) of the two wings (3) are coupled, aligning the threaded hole (51) of the upper elements (E1) with the housing (52) of the lower elements (E2).

[0070] The nut (53) is screwed inside the threaded hole (51) and inside the housing (52), in such a way to create the removable thread (55a) on the lateral wall (55) of the housing (52). In view of the above, the corner joint (1) can be moved, without causing the separation of the upper elements (E1) from the lower elements (E2) of the two wings.

[0071] The corner joint (1) is inserted inside the longitudinal channels (22) of the profiles (2) in order to fasten the two profiles. A tool is inserted in the hole (24) of the profiles (2) in order to additionally screw the nut (53) in the threaded hole (51) and in the housing (52).

[0072] The tip (54) of the nut (53) breaks the removable thread (55a) of the housing (55) and turns in idle in the housing (52). The thread of the nut (53) cooperates with the thread of the threaded hole (51), in such a way to move the upper elements (E1) away from the lower elements (E2) of the two wings, until the upper elements (E1) and the lower elements (E2) of the two wings abut against the walls that define the longitudinal channels (22) of the profiles (2). Simultaneously, the tooth (37) of the upper element (E1) of each wing (3) abuts against the first end (25a) of the slot (25) of one of the two profiles (2), in such a way that the teeth (37) push the profiles (2) one against the other, fastening the two profiles (2).

[0073] Then, an adhesive is introduced in the longitudinal channel (22) of the profiles (2) through the hole (24) of the profiles (2). The adhesive is disposed between the upper surface (60) of the central portion (6) and the internal surface of the external walls (20) of the profiles (2).

[0074] The adhesive travels along the "U-shaped" primary cavity (10), sliding into the grooves (63), and enters the secondary cavity (11) through the inlets (66) that are in communication with the grooves (63). In this way, the adhesive, is disposed along an annular trajectory, around the central portion (6), in the vertex (V3) between the profiles (2) in order to make the profiles (2) adhere.

Claims

1. Corner joint (1) suitable for being disposed inside longitudinal channels (22) of two profiles (2) for fastening said two profiles (2); said corner joint (1) comprising:

   - two wings (3), each of them suitable for being disposed inside the longitudinal channel (22) of one of the two profiles (2); each wing (3) comprises an upper element (E1) and a lower element (E2) joined to the upper element (E1);
   - adjustment means (5) to move said upper element (E1) of each wing (3) in such a way to adjust the distance between the upper elements (E1) and the lower elements (E2) of the two wings (3); said adjustment means (5) comprising:
   - a threaded hole (51) obtained on the upper element (E1) of at least one of the two wings (3);
   - a housing (52) obtained on the lower element (E2) of at least one of the two wings (3) and aligned with the threaded hole (51); said housing (52) comprising a lateral wall (55);
   - a nut (53) screwed into said threaded hole (51) and comprising a tip (54) disposed in the housing (52);

   said corner joint being (1) being **characterized by** the fact that the thread of the nut (53) is engaged, in correspondence of the tip (54), in a removable thread (55a) that is obtained on the lateral wall (55) of the housing (52).

2. The corner joint (1) of claim 1, wherein the upper elements (E1) and the lower elements (E2) of the two wings (3) are made of a non-elastic material and said lower elements (E2) are made of a softer material than the one used for the nut (53).

3. The corner joint (1) of claim 1 or 2, wherein the tip (54) of said nut (53) is flat and said housing (52) has a flat bottom wall (52a).

4. The corner joint (1) of any one of the preceding claims, wherein the lower element (E2) of at least one of the two wings (3) comprises a guide surface (40) that is configured in such a way to guide the sliding of the upper elements (E1) relative to the lower elements (E2) of the two wings (3); the upper element (E1) of at least one of the two wings (3) comprising a counter-surface (35) that is disposed in contact with said guide surface (40) in such a way to cooperate with said guide surface (40) during the sliding of the upper elements (E1) of the two wings relative to the lower elements (E2).

5. The corner joint (1) of any one of the preceding claims, wherein the upper elements (E1) of the two wings (3) are disposed at right angle, in such a way to form a vertex (V1); said lower elements (E2) of the two wings (3) are disposed at right angle, in a way to form a vertex (V2); said threaded hole (51) is obtained in correspondence of the vertex (V1) of the upper elements (E1); said housing (52) is obtained in the vertex (V2) of the lower elements (E2).

6. The corner joint (1) of any one of the preceding claims, wherein said wing (3) comprises:

   - an external surface (30), forming an obtuse angle with the external surface (30) of the other

wing (3);
- an internal surface (31), forming a right angle with the internal surface (31) of the other wing (3);
- two parallel lateral surfaces (32) in coplanar position relative to the lateral surfaces (32) of the other wing (3);

said corner joint (1) comprising a central portion (6) that joins said two wings (3); said central portion (4) being suitable for being disposed in a vertex (V3) between the two profiles (2); said central portion (6) comprising:

- a flat external surface (60) that joins the external surfaces (30) of the two wings (3);
- two lateral surfaces (62), each of them joining the lateral surfaces (32) of the two wings (3);

each lateral surface (62) of the central portion (6) comprising a groove (63) provided with a bottom wall (64) that is joined to the external surface (60) of the central portion (6);
said central portion (6) comprising an internal surface (61) that joins the internal surfaces (31) of the two wings (3); said internal surface (61) comprising a centering notch (65) that is suitable for housing the ending edges of the profiles (2) in abutting position and comprising:

- two narrow portions (65a), which end on the bottom walls (64) of the grooves (63);
- one enlarged portion (65b), which is disposed between the two narrow portions (65a); the width of said enlarged portion (65b) being higher that the width of the narrow portions (65a).

7. The corner joint (1) of claim 6, wherein the internal surface (61) of the central portion (6) comprises a pair of inlets (66) among which the centering notch (61 a) is disposed; each inlet (66) comprising a bottom wall (67) that is joined with the bottom wall (64) of the grooves (63).

8. Assembly (G) comprising:

- two quadrangular profiles (2) disposed at right angle in such a way to form a vertex (V3); each profile (2) comprising a longitudinal axis (X), an external wall (20), an internal wall (21), and a pair of lateral walls (23); each profile (2) comprising a longitudinal channel (22) defined by said walls (20, 21, 23); the longitudinal channel (22) of a profile (2) being in communication with the longitudinal channel (22) of the other profile (2); the external wall (20) of at least one of the two profiles (2) comprising a hole (24) that ends in the longitudinal channel (22) of the profile (2);
- a corner joint (1) used for fastening the two profiles (2), according to claim 1.

9. The assembly (G) of claim 8, wherein the hole (24) is obtained in the vertex (V3) of the profiles (2).

10. The assembly (G) of claim 8 or 9, wherein the external wall (20) of each profile (2) comprises a slot (25) that ends in said longitudinal channel (22); said upper element (E1) of each wing (3) of the corner joint (1) comprising a tooth (37) that is slidingly mounted in one of the two slots (25).

11. The assembly (100) of any one of claims 8 to 10, wherein each wing (3) of the corner joint comprises:

- an external surface (30), abutting against an internal surface of the external wall (20) that defines the longitudinal channel (22) of the profile (2);
- an internal surface (31), abutting against an internal surface of the internal wall (21) that defines the longitudinal channel (22) of the profile (2);
- two parallel lateral surfaces (32), abutting against an internal surface of the lateral walls (23) that define the longitudinal channel (22) of the profile (2);

said corner joint (1) comprising a central portion (6) that joins said two wings (3) and is disposed in the vertex (V3) between the two profiles (2); said central portion (6) comprising:

- a flat external surface (60) that joins the external surfaces (30) of the two wings (3);
- two lateral surfaces (62), each of them joining the lateral surfaces (32) of the two wings (2);

wherein each lateral surface (62) of the central portion (6) of the corner joint (1) comprises a groove (63) provided with a bottom wall (64) that is joined with the external surface (60) of the central portion (6); said external surface (60) of the central portion (6) and said grooves (63) generating a "U-shaped" primary cavity (10) with the internal surface of the external wall (20) and of the lateral walls (23) of the profiles (2), said "U-shaped" primary cavity (10) housing an adhesive that is introduced through the hole (24) of the profiles (2);
said central portion (6) comprising an internal surface (61) that joins the internal surfaces (31) of the two wings (3); said internal surface (61) comprising a centering notch (65) that houses the ending edges of the profiles (2) in abutting position, and comprising:

- two narrow portions (65a) that end on the bot-

tom walls (64) of the grooves (63);
- one enlarged portion (65b) that is disposed between the two narrow portions (65a); the width of said enlarged portion (65b) being higher than said narrow portions (65a).

12. The assembly (G) of claim 11, wherein the internal surface (61) of the central portion (6) comprises a pair of inlets (66) among which the centering notch (65) is disposed; each inlet (66) comprising a bottom wall (67) that is joined with the bottom wall (64) of the grooves (63); said bottom wall (67) of the inlets (66) generating a secondary cavity (11) with the internal surface of the internal wall (21) of the profiles (2), said secondary cavity (11) being suitable for housing an adhesive; said secondary cavity (11) joining the grooves (63) of the "U-shaped" primary cavity (10) in a way that the adhesive is disposed according to an annular trajectory.

13. Process for transporting a corner joint (1) and mounting said corner joint (1) inside two profiles (2); said process comprising the following steps:

- aligning a threaded hole (51) obtained on the upper elements (E1) of two wings (3) of the corner joint (1) with a housing (52) obtained on the lower elements (E2) of the two wings (3) of the corner joint (1);
- screwing a nut (53) of adjustment means (5) of the corner joint (1) inside the threaded hole (51) and inside the housing (52) in such a way to create a removable thread (55a) on a lateral wall (55) of the housing (52);
- inserting the corner joint (1) inside the longitudinal channels (22) of the profiles (2);
- screwing the nut (53) of the adjustment means (5) of the corner joint (1) in the threaded hole (51) and in the housing (52), in such a way to break the removable thread (55a) and successively turn in idle in said housing (52), in order to cooperate with the thread of the threaded hole (51), in such a way to move the upper elements (E1) of the two wings away from the lower elements (E2), until the upper elements (E1) and the lower elements (E2) of the two wings abut against walls defining the longitudinal channels (22) of the profiles (2).

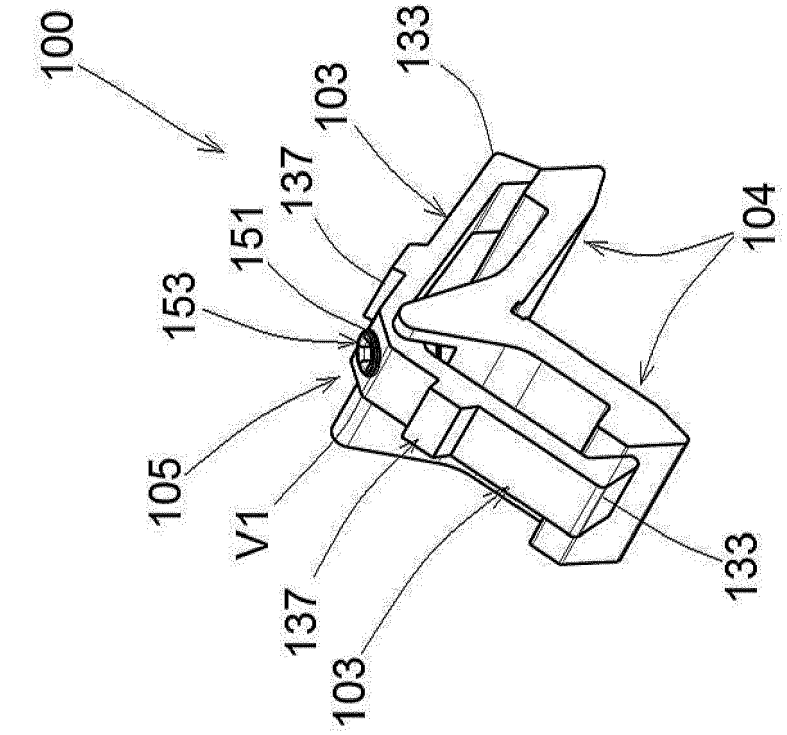

FIG. 2
PRIOR ART

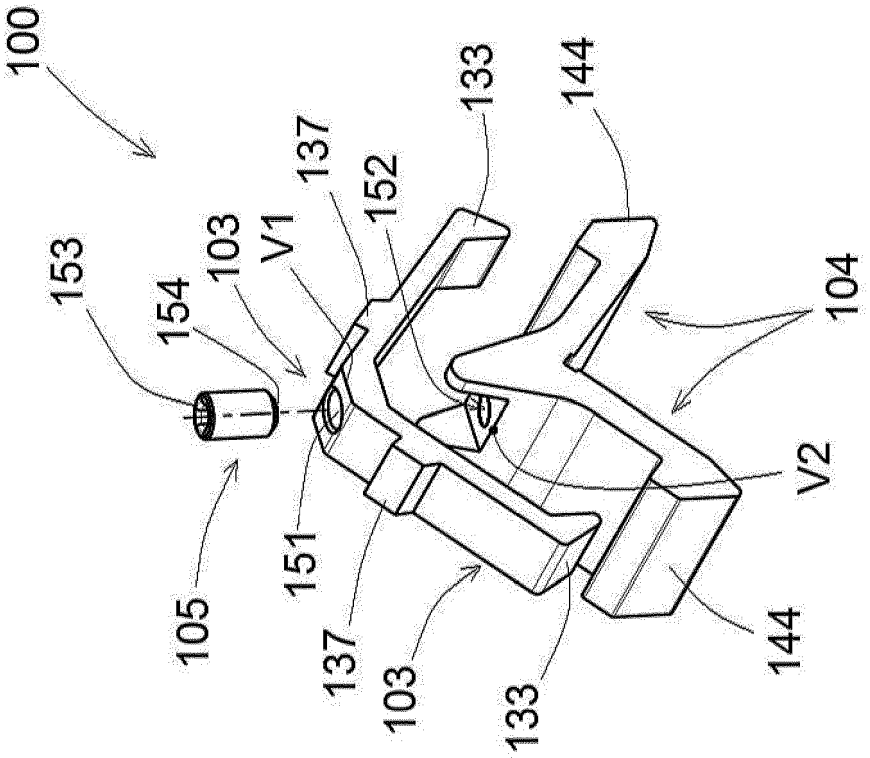

FIG. 1
PRIOR ART

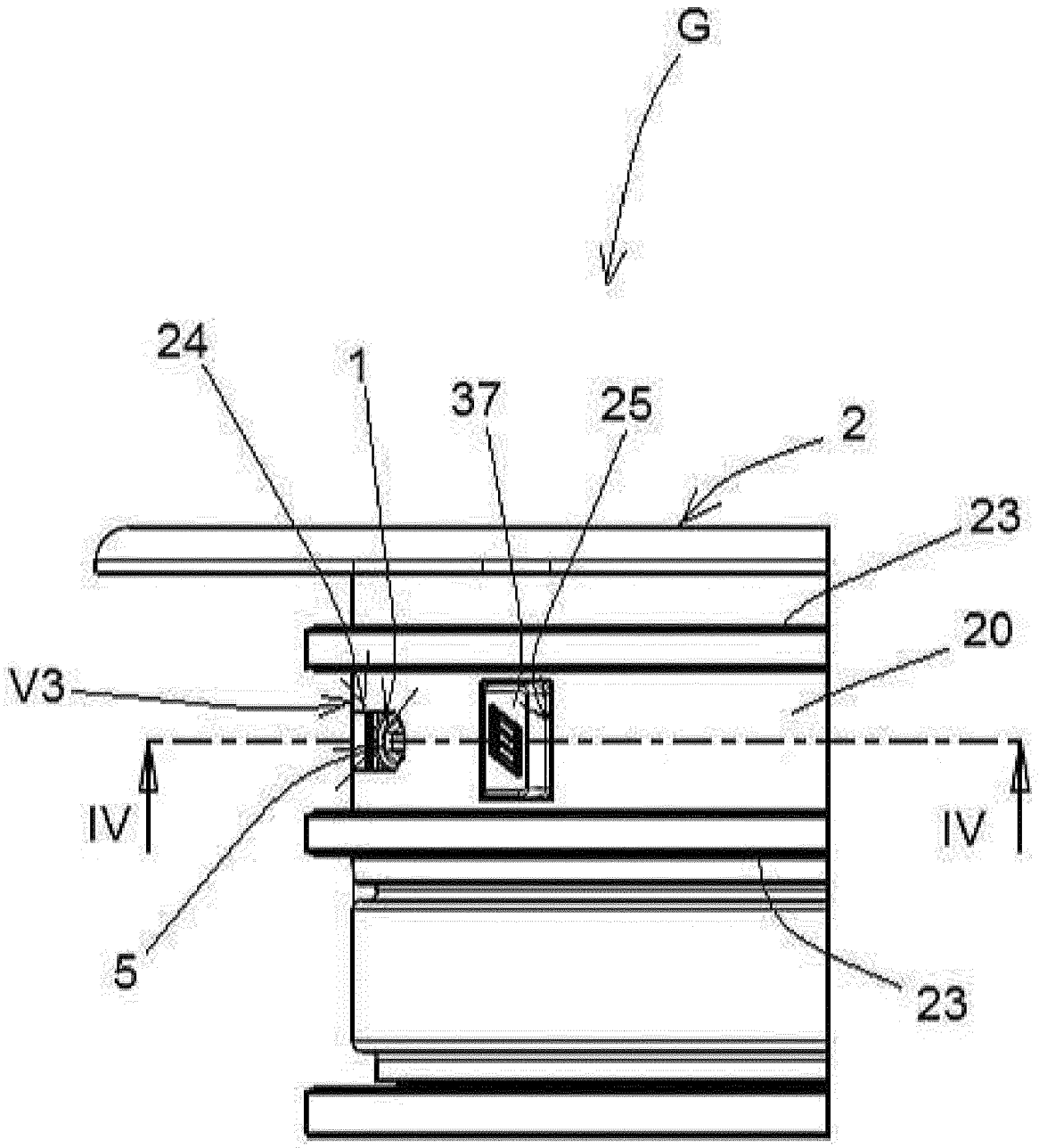

FIG. 3

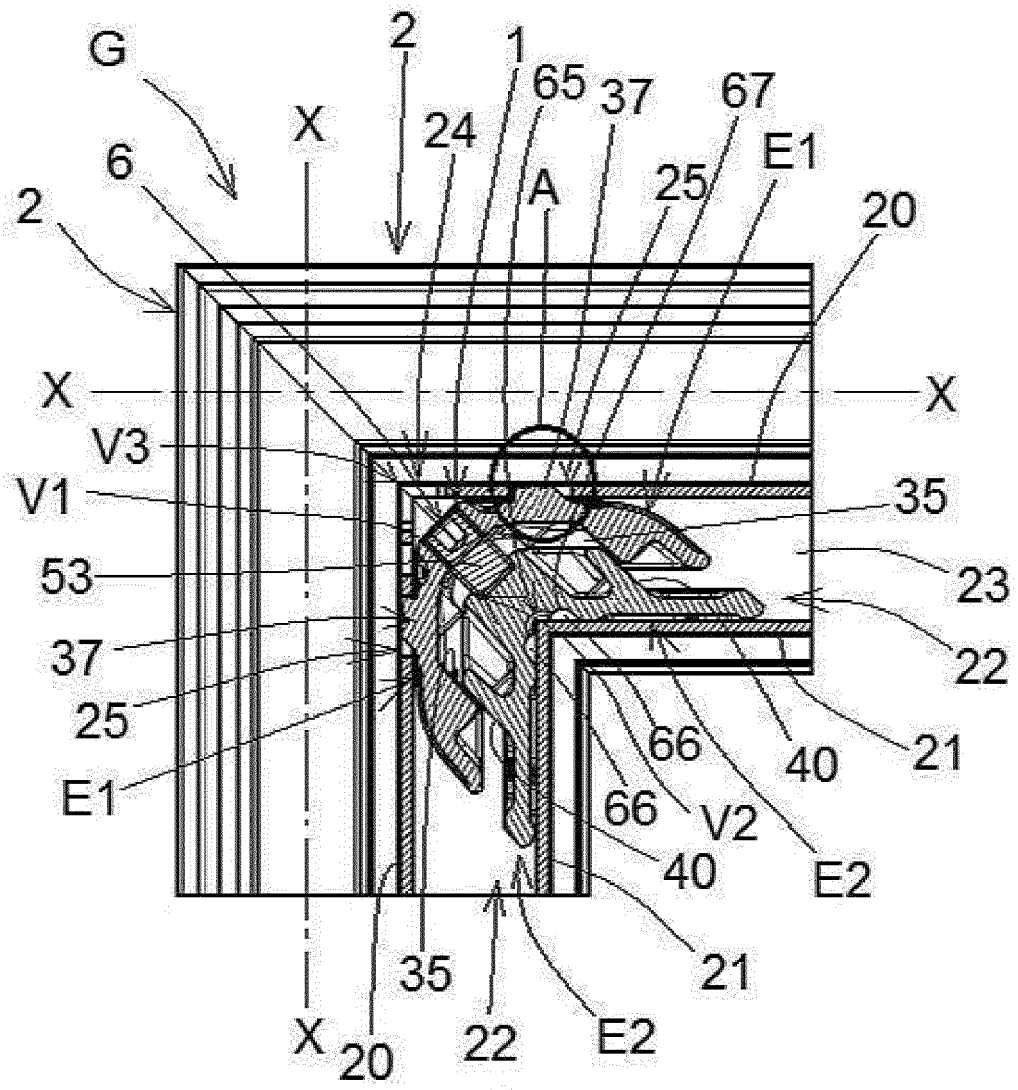
G
2
1
65
37
67
X
24
E1
6
A
25
20
2
X
X
V3
V1
35
53
23
37
22
25
66
40
21
E1
66
V2
40
E2
21
35
X
20
22
E2

FIG. 4

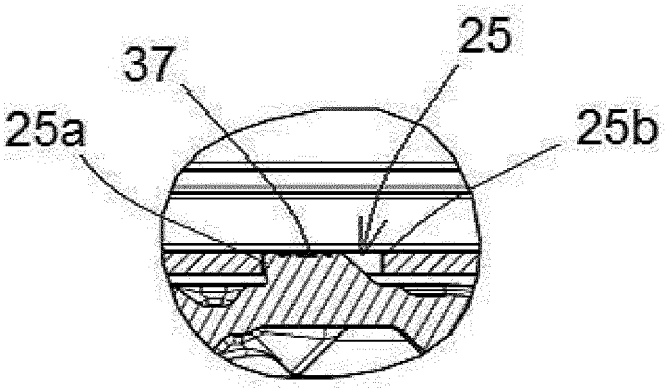
25
37
25a
25b

FIG. 4A

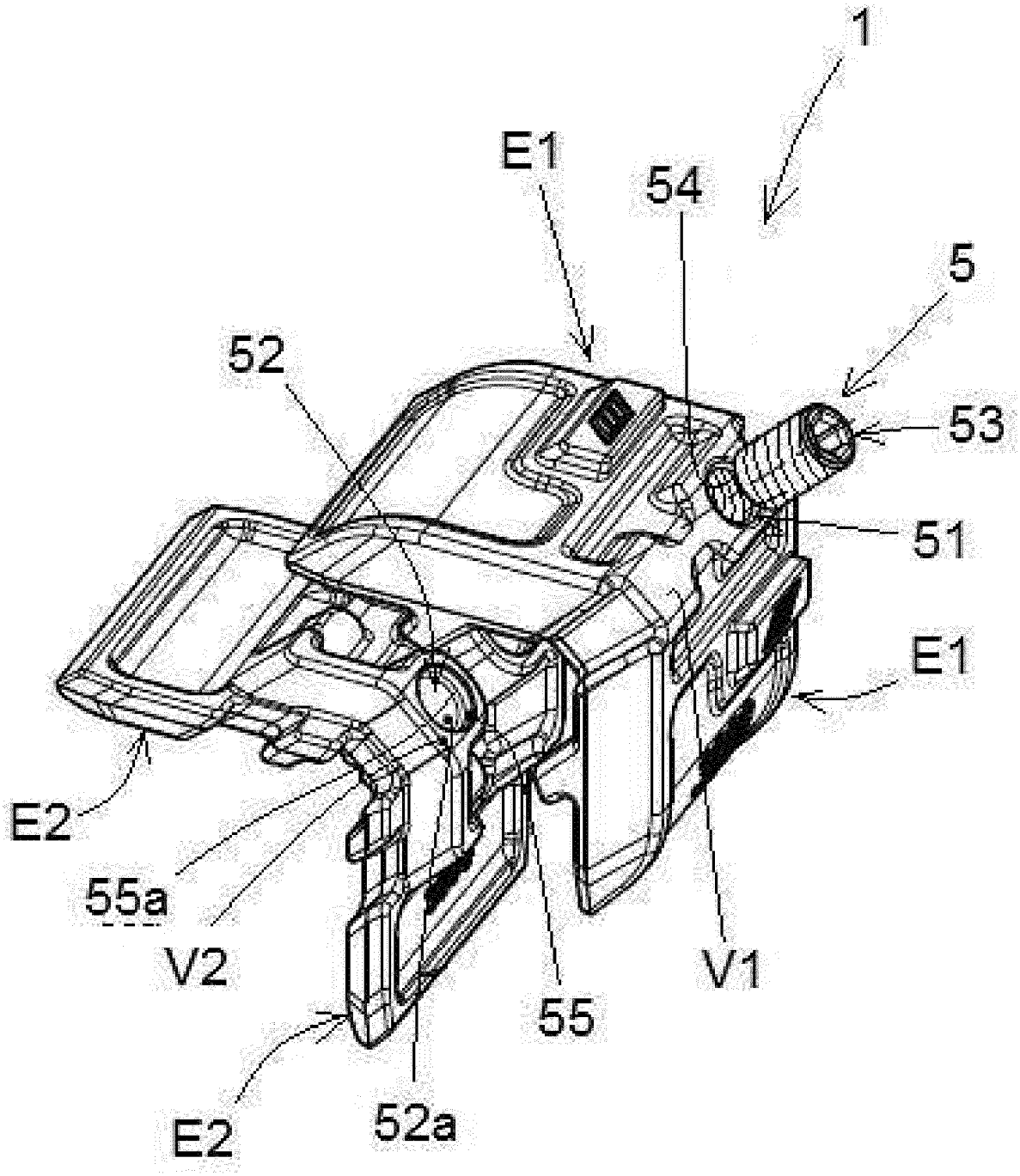

FIG. 5

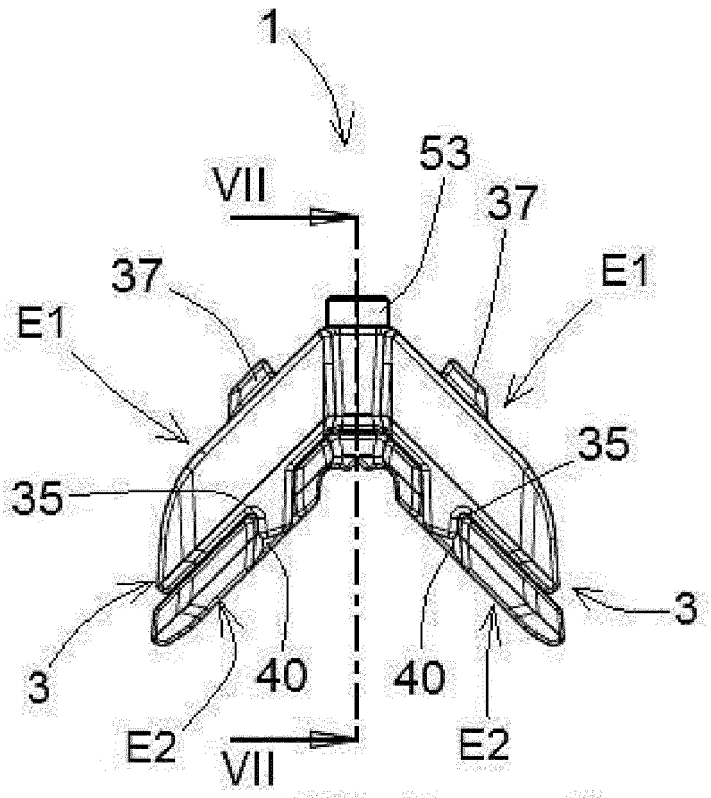

FIG. 6

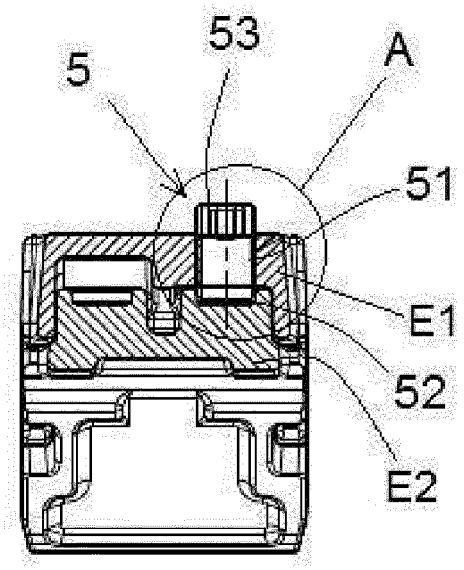

FIG. 7

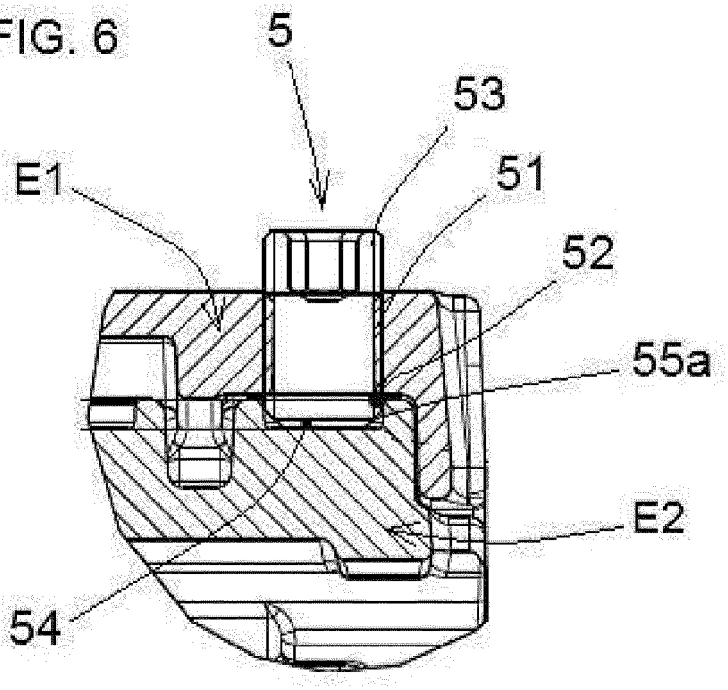

FIG. 7A

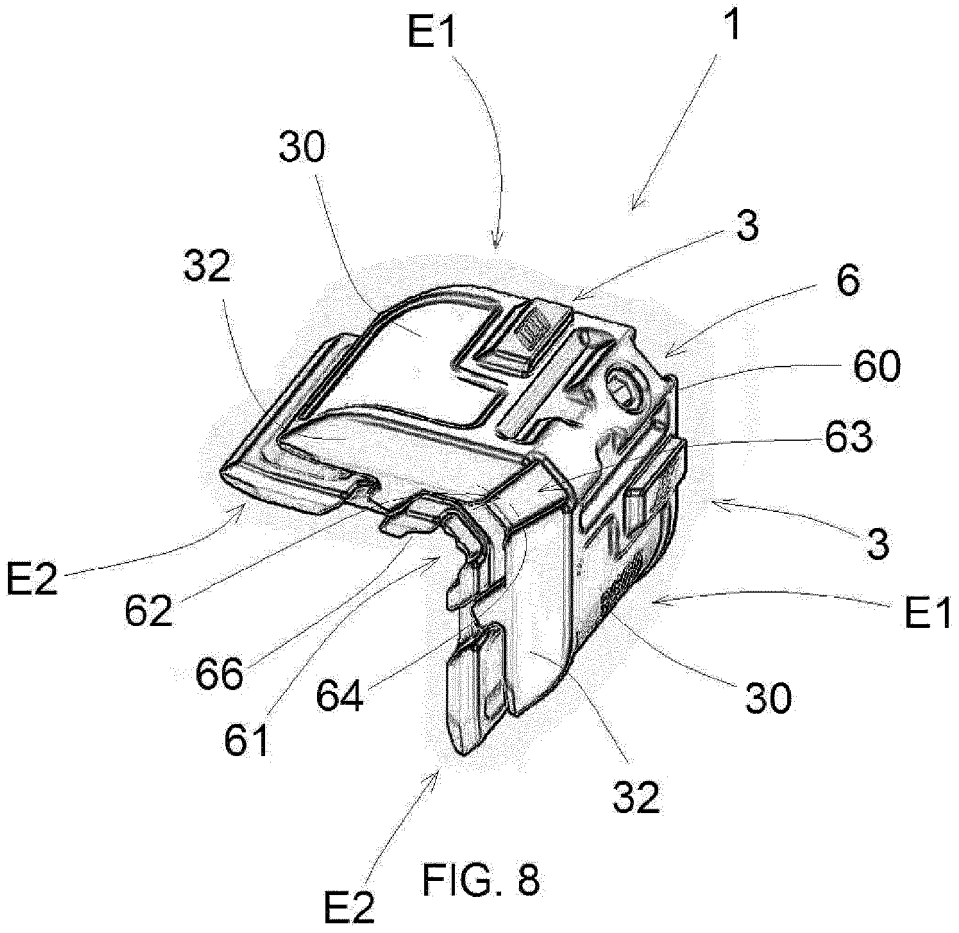
E1
1
30
3
32
6
60
63
3
E2
62
E1
66
64
30
61
32
E2

FIG. 8

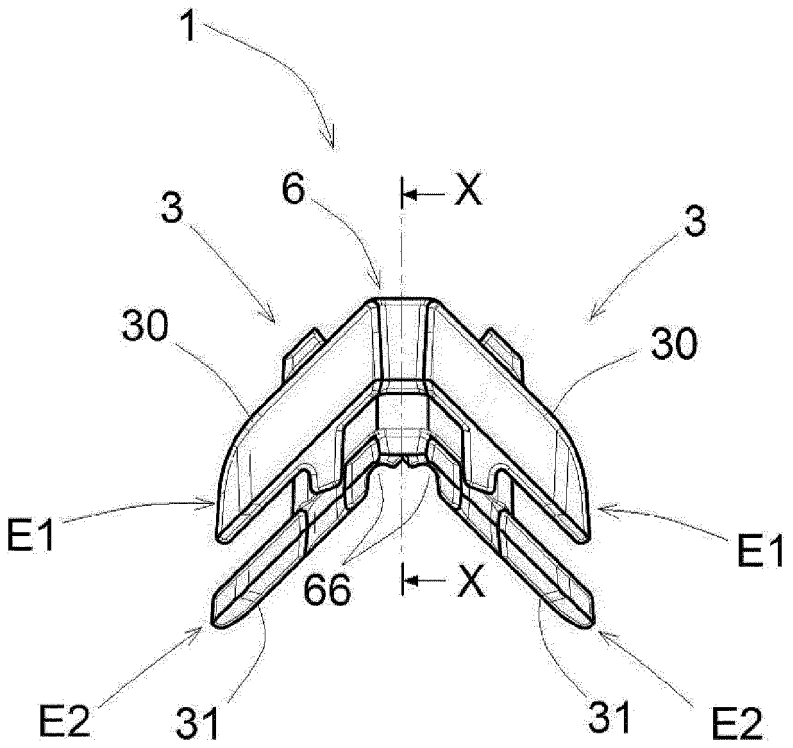
1
6
X
3
3
30
30
E1
E1
66
X
E2
31
31
E2

FIG. 9

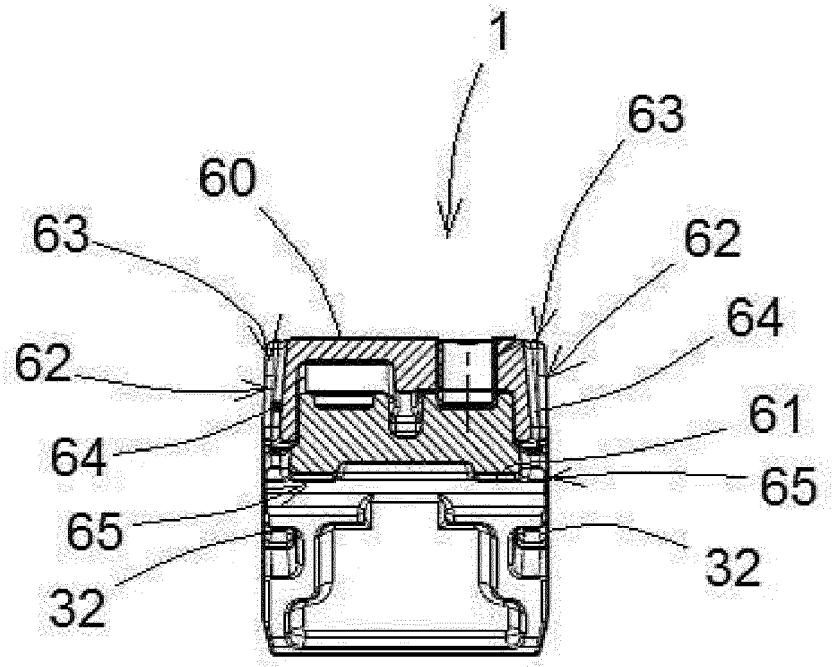

FIG. 10

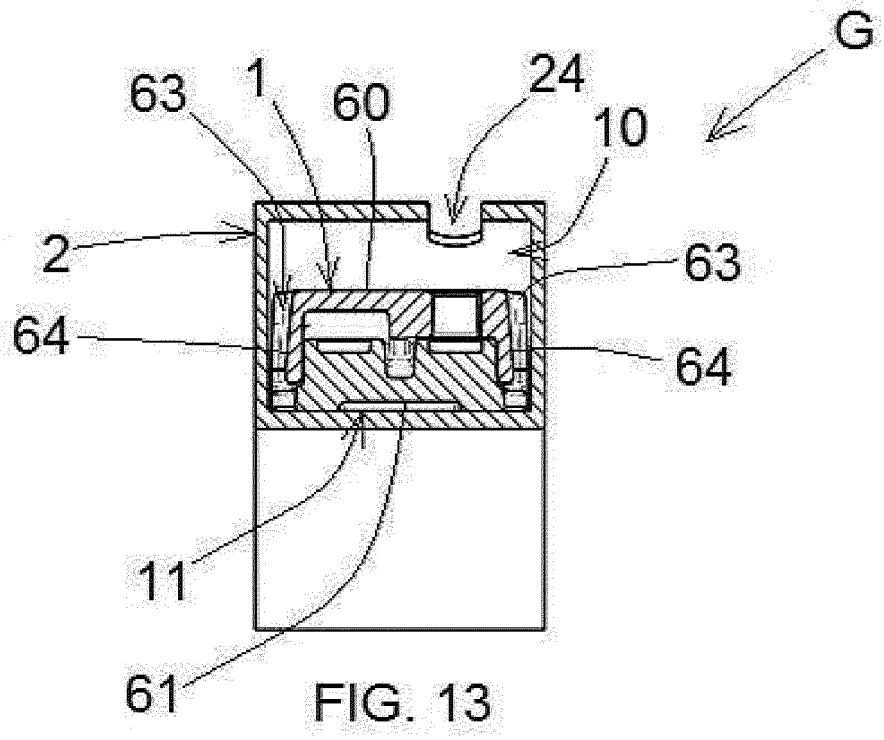

FIG. 13

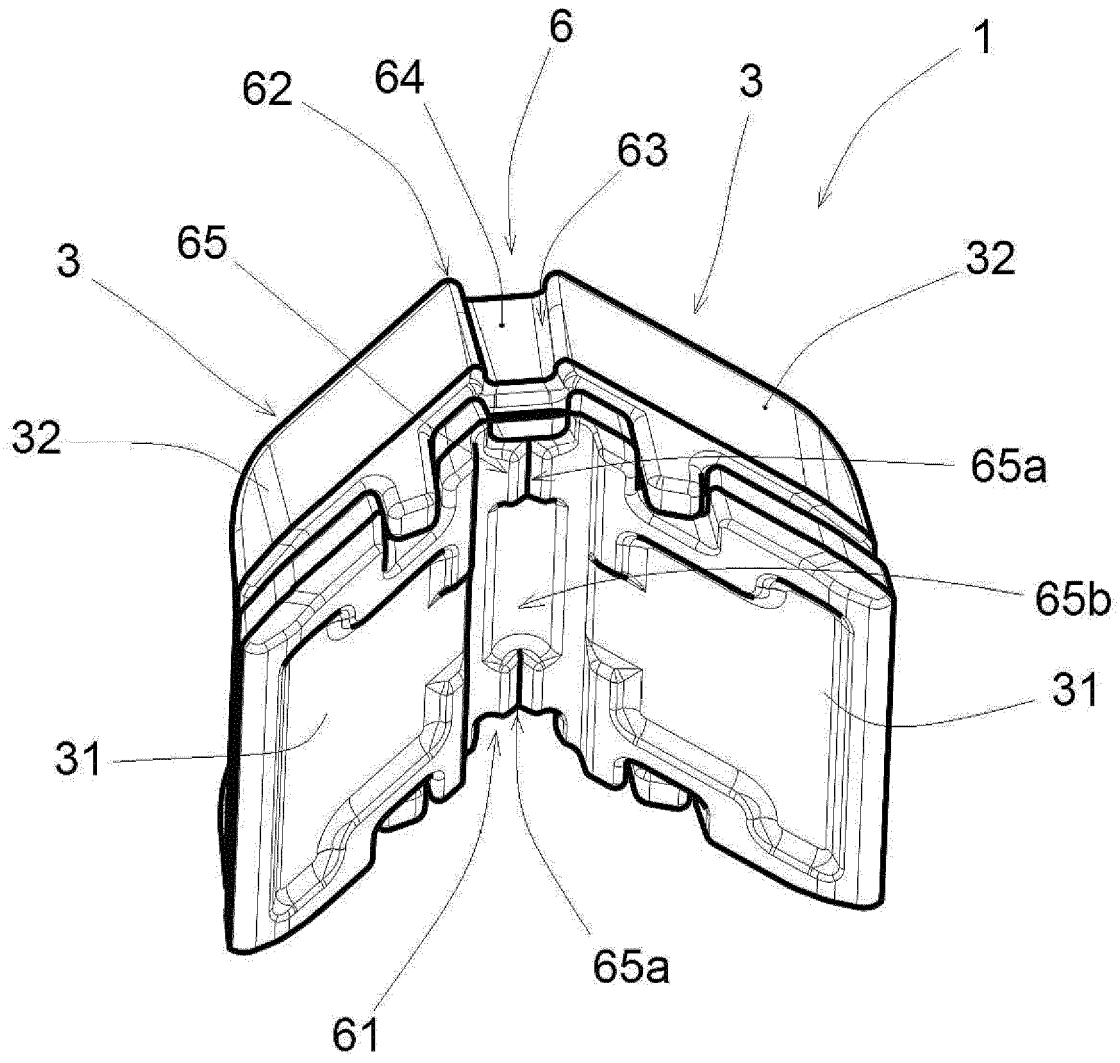

FIG. 11

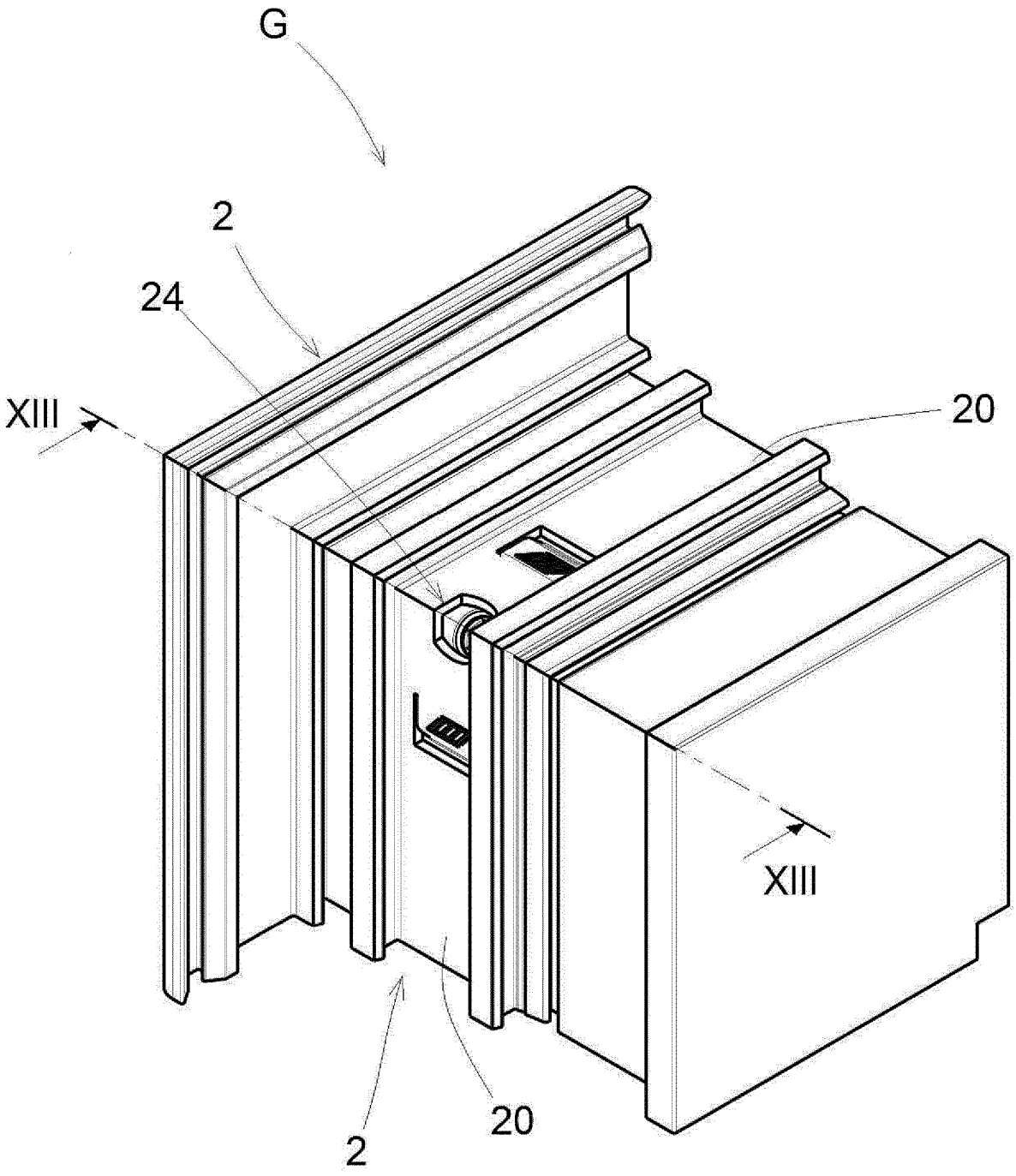

FIG. 12

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European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 18 15 4280

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2006/059843 A1 (LEONTARIDIS ATHANASIOS [GR]) 23 March 2006 (2006-03-23) * figures 1-9c * -----	1-13	INV. E06B3/968 F16B7/04 F16B11/00
A	US 3 388 936 A (GEBHARD PAUL C) 18 June 1968 (1968-06-18) * figures 1-19 * -----	1-13	ADD. E06B3/972

TECHNICAL FIELDS SEARCHED (IPC)

E06B
F16B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 April 2018	Cobusneanu, D

CATEGORY OF CITED DOCUMENTS

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L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 15 4280

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20-04-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006059843 A1	23-03-2006	NONE	
US 3388936 A	18-06-1968	NONE	

EPO FORM P0459

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