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(54) **Cross-member for in-wall frames of retractable sliding doors**

(57) A cross-member (1, 101) for in-wall frames of retractable sliding doors, which is substantially omega-shaped so as to define a flat base (2) and a pair of L-shaped lateral wings (3a, 3b), the cross-member having at the flat base (2), temporary axial coupling means that cooperate with one of several engagement means that are present on another, similar cross-member (101) that is selectively lockable in position by way of temporary locking means.

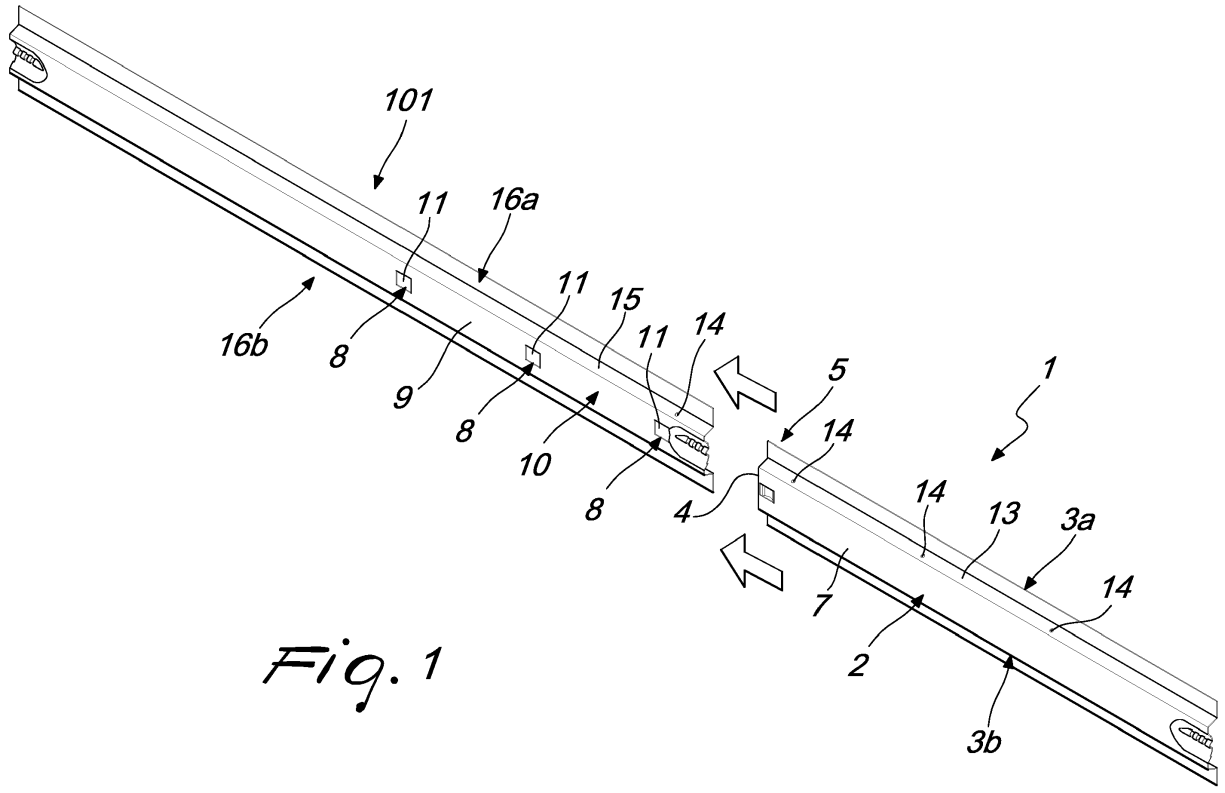

Fig. 1

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Description

[0001] The present invention relates to a cross-member for in-wall frames of retractable sliding doors.

[0002] Nowadays it is known to provide door frames which involve the use of a casing, positioned inside a wall, in which a door or a panel is slideably associated and which is also known as a "retractable door".

[0003] Such solution makes it possible to reduce the encumbrances of the door in a room thanks to the possibility of sliding it into the casing: thus one can use the space adjacent to the door, which would otherwise be occupied by doors of the type that are hinged laterally to a casement.

[0004] In the known art, the frame embedded in the wall is usually constituted by a framework which comprises a plurality of vertical profiled elements, a front post and a rear post, which are connected by horizontal cross-members which define a containment casing of the panel or of the door.

[0005] Protruding above the case, along an axis that is longitudinal with respect to the case proper and that extends from the side opposite to that of the containment case, is a rail which is hidden by a jamb.

[0006] Trolleys coupled to the upper edge of the door are slideably integrated in the rail in order to enable the sliding of the door into and out of the in-wall casing.

[0007] Usually associated with the end of the rail which is not associated with the vertical post locators is an additional post that acts as a terminal for the abutment of the front edge of the door.

[0008] Such conventional door frames thus use metallic profiles that can be mounted together and are sold for example in kit form for assembly.

[0009] To this end, this applicant is holder of Italian application no. TV2010A000011 in which an in-wall casing is disclosed for retractable sliding doors, which is characterized in that at least the crossbeam, the rail, the cross-members, and the spacer can be cut to measure because reference pre-cuts are provided, and also in which the jambs comprise at least the crossbeam jamb which can be cut to measure so that the in-wall casing can be modified at installation time, in order to obtain various different possibilities for the passage opening, further provided with an adjustable infill jamb with integrated architraves and a door track that can be adjusted for multiple door panel thicknesses.

[0010] Although such solution is valid, it suffers a drawback in that the user has to physically shorten the components in order to adapt them to the dimensions of the spaces.

[0011] This requires time and the use of special tools that require, furthermore, a certain level of skill in the use thereof.

[0012] The aim of the present invention is therefore to resolve the above mentioned technical problems, by eliminating the drawbacks in the cited known art and hence providing an invention that enables the user to mount components of an in-wall casing of retractable sliding doors rapidly and with great ease, without using special cutting tools.

[0013] Within this aim, an important object of the invention is to provide a component of an in-wall casing of retractable sliding doors, whose dimensions adapt to the spaces in which it is to be placed.

[0014] Another object is to obtain a component of an in-wall casing of retractable sliding doors which can be considered universal and thus adaptable on-site on the basis of specific requirements.

[0015] Another object is to provide an invention that is structurally simple, can be provided with conventional systems and machines, and is low cost.

[0016] This aim and these and other objects which will become better apparent hereinafter, are achieved by a cross-member for in-wall frames of retractable sliding doors, which is substantially Ω-shaped so as to define a flat base and a pair of L-shaped lateral wings, characterized in that it has, at said flat base, temporary axial coupling means that cooperate with one of several engagement means that are present on another, similar cross-member that is selectively lockable in position by way of temporary locking means.

[0017] Further characteristics and advantages of the invention will become better apparent from the detailed description of a particular, but not exclusive, embodiment, illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a perspective view of two cross-members that are not coupled together;
Figure 2 is a perspective view of two cross-members that are coupled together;
Figure 3 is a plan view of the region of interconnection between two cross-members;
Figure 4 is a sectional view taken along the line IV-IV in Figure 3;
Figure 5 is a perspective view of the stable locking between two cross-members that are coupled together;
Figure 6 shows a detail of Figure 5.

[0018] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

[0019] Moreover, it should be 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.

[0020] With reference to the figures, the reference numeral 1 generally designates a cross-member for in-wall frames of retractable sliding doors, which, in a transversal sectional view, is substantially Ω-shaped so as to define a base 2 and a pair of L-shaped lateral wings 3a, 3b.

[0021] The cross-member has, at the flat base 2 and proximate to the perimetric edge 4 of one end 5, tempo-

rary axial coupling means that are constituted by a flap 6 protruding below the plane of arrangement of the upper surface 7 of the flat base 2.

[0022] The flap 6 is advantageously provided at the median axis of the flat base 2.

[0023] The flap 6 is obtained preferably by drawing and advantageously has a shape structure, in a longitudinal sectional view, that is substantially curved with concavity directed toward the inside of the flat base 2.

[0024] The flap 6 is substantially rectangular in plan view and has the free end directed toward the perimetric edge 4.

[0025] The flap 6 cooperates with one of several engagement means 8 that are present on an upper surface 9 of a flat base 10 of another, similar cross-member 101, the means being constituted by a seat 11 that is adapted to accommodate the flap 6.

[0026] The number of seats 11 can be any, as a function of specific requirements, such as the length of the cross-members 1 and/or 101.

[0027] The seats 11 are further defined at the median axis of the flat base 10 of the cross-member 101 and are arranged at intervals of a chosen distance, which may be constant or variable as a function of the length of the cross-member 101.

[0028] The flap 6 can be removed from the seat 11 by pushing it from below so that it exits from the seat 11 so as to make it possible to decouple the cross-members 1 and 101 from each other.

[0029] The flap 6 can be arranged in the chosen one of the seats 11 that are provided on the upper surface 9 of the flat base 10 of the cross-member 101.

[0030] The cross-members 1 and 101, thus connected, can be selectively locked in position by way of temporary locking means that are constituted by screws 12; in particular, the screws 12 can be two in number and be arranged at the vertical rib 13 of the lateral wings 3a, 3b, which conveniently have previously been perforated so as to obtain a chosen number of holes 14 arranged at intervals of a chosen distance.

[0031] The holes 14 can also be defined on the vertical rib 15 of the lateral wings 16a, 16b of the cross-member 101.

[0032] Advantageously the screwing of the screws 12 can occur according to a plane that is inclined with respect to the plane of arrangement of the vertical ribs 13.

[0033] Thus it has been found that the invention fully achieves the intended aim and objects, a cross-member being devised that can be put together to measure, as a function of the specific dimensions found on-site, so as to obtain, rapidly and with great ease, an in-wall casing of the desired measurements.

[0034] Furthermore, thanks to the ability to interconnect the components by way of a bayonet-like coupling, a product can be obtained that is stable in its structure and without using special cutting tools and without therefore the need to shorten them.

[0035] Thus an in-wall casing of retractable sliding doors can be provided whose width and height dimensions are adapted directly on-site to the spaces in which it is to be placed.

[0036] Finally, the assembly operations are considerably facilitated for the technician, the invention being thereby structurally simple, it being possible to provide it with the usual plants and machines and being low cost.

[0037] The invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0038] The materials used as well as the dimensions of the individual components of the invention may be more pertinent according to specific requirements.

[0039] The various means for achieving certain different functions certainly need not coexist only in the embodiment shown, but may be present in many embodiments, even if they are not shown. The characteristics indicated above as advantageous, convenient or the like, may also be missing or be substituted by equivalent characteristics.

[0040] The disclosures in Italian Utility Model Application No. TV2013U000055 from which this application claims priority are incorporated herein by reference.

[0041] 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 cross-member (1, 101) for in-wall frames of retractable sliding doors, which is substantially Ω-shaped so as to define a flat base (2) and a pair of L-shaped lateral wings (3a, 3b), **characterized in that** it has, at said flat base (2), temporary axial coupling means that cooperate with one of several engagement means that are present on another, similar cross-member (101) that is selectively lockable in position by way of temporary locking means.

2. The cross-member according to claim 1, **characterized in that** it has, at said flat base (2) and proximate to a perimetric edge (4) of one end (5), temporary axial coupling means that are constituted by a flap (6) protruding below the plane of arrangement of the upper surface (7) of the flat base (2).

3. The cross-member according to claims 1 and 2, **characterized in that** said flap (6) is provided at the median axis of said flat base (2).

4. The cross-member according to claim 2, **characterized in that** said flap (6) is obtained by drawing and has a shape structure, in a longitudinal sectional

view, that is substantially curved with concavity directed toward the inside of said flat base (2).

5. The cross-member according to claim 2, **characterized in that** said flap (6) cooperates with one of several engagement means (8) that are present on the upper surface (9) of the flat base (10) of another, similar cross-member (101), said means being constituted by at least one seat (11) that is adapted to accommodate said flap (6).

6. The cross-member according to claim 2, **characterized in that** said flap (6) is substantially rectangular in plan view and has the free end directed toward said perimetric edge (4).

7. The cross-member according to claim 5, **characterized in that** the number of said seats (11) varies as a function of specific requirements, such as the length of said cross-members (1) and/or (101).

8. The cross-member according to claim 5, **characterized in that** said seats (11) are defined at the median axis of said flat base (10) of said cross-member (101) and are arranged at intervals of a chosen distance, constant or variable as a function of the length of said cross-member (101).

9. The cross-member according to one or more of the preceding claims, **characterized in that** said flap (6) is removable from said seat (11) by pushing it from below so that it exits from said seat (11) so as to make it possible to decouple said cross-members (1) and (101) from each other.

10. The cross-member according to one or more of the preceding claims, **characterized in that** said flap (6) is arranged in the chosen one of said seats (11) which are provided on the upper surface (9) of said flat base (10) of said cross-member (101).

11. The cross-member according to one or more of the preceding claims, **characterized in that** said cross-members (1) and (101) thus connected can be selectively locked in position by way of temporary locking means that are constituted by one or more screws (12) arranged at one or both of the vertical ribs (13) of said lateral wings (3a, 3b), which have previously been perforated so as to obtain a chosen number of holes (14) arranged at intervals of a chosen distance.

12. The cross-member according to claim 11, **characterized in that** said holes (14) are defined also on one or both of the vertical ribs (13) of the lateral wings (16a, 16b) of said cross-member (101).

13. The cross-member according to claim 11, **characterized in that** the screwing of said screws (12) occurs according to a plane that is inclined with respect to the plane of arrangement of said vertical ribs (13).

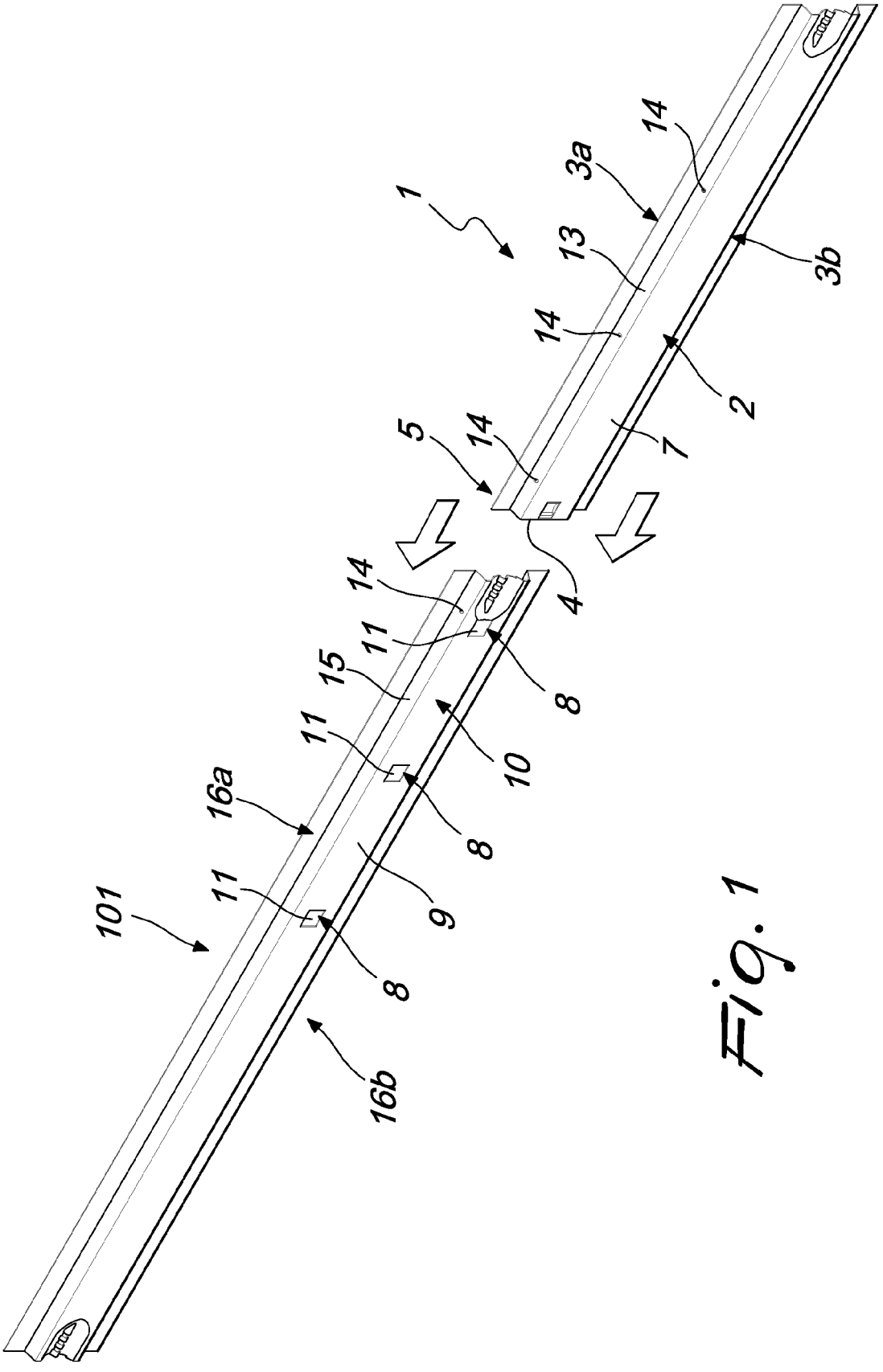

Fig. 1

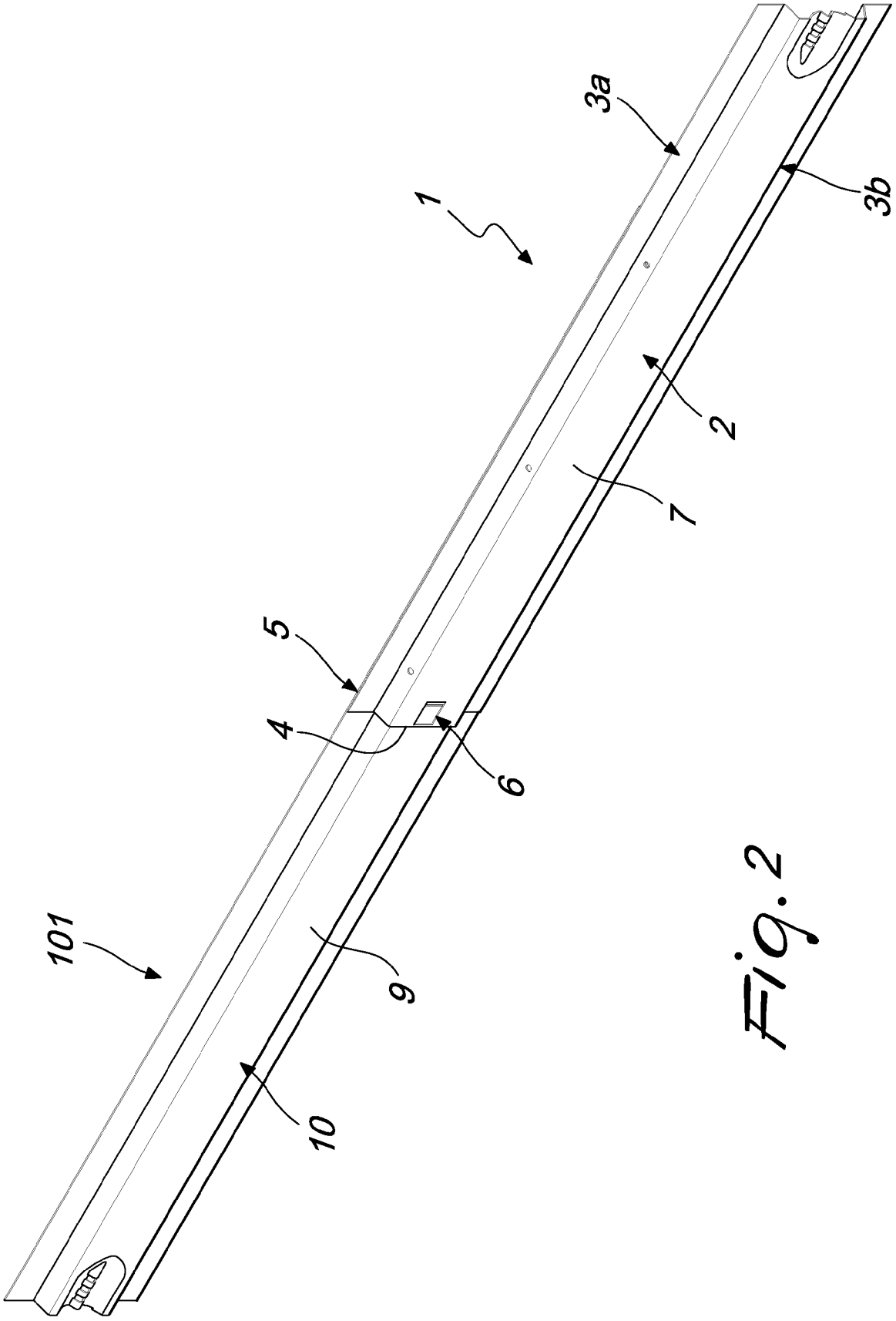

Fig. 2

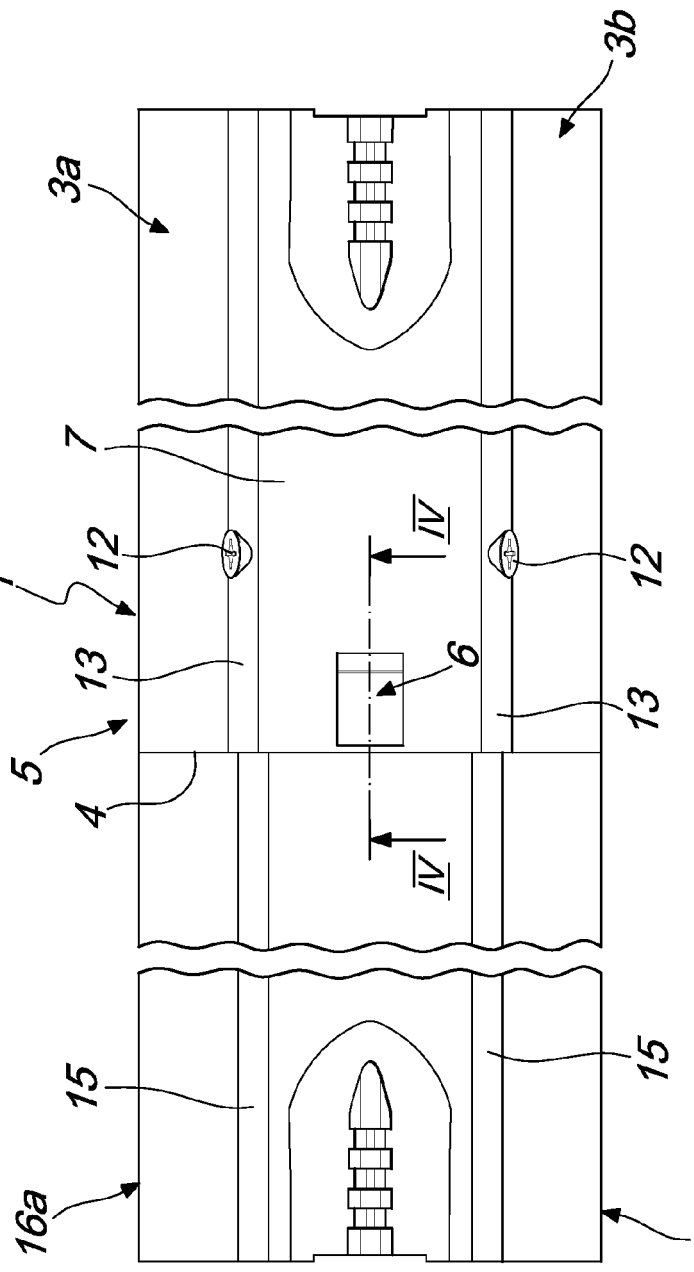

Fig. 3

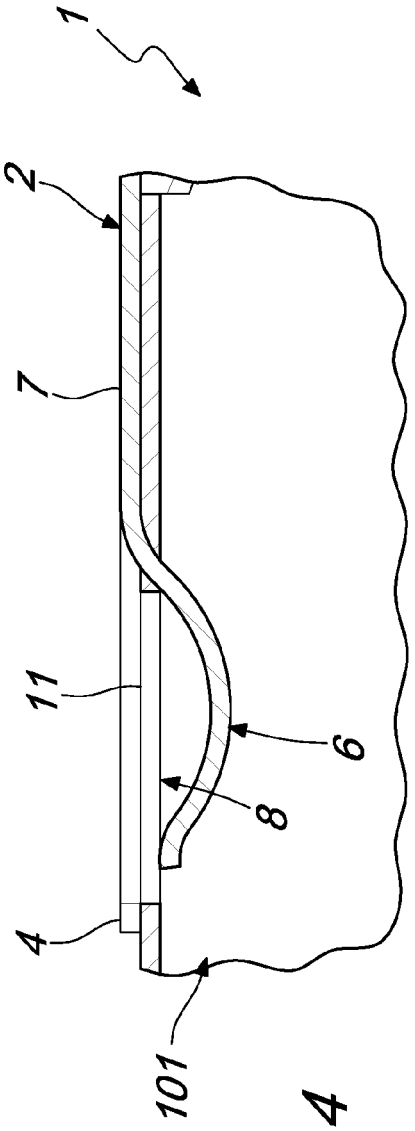

Fig. 4

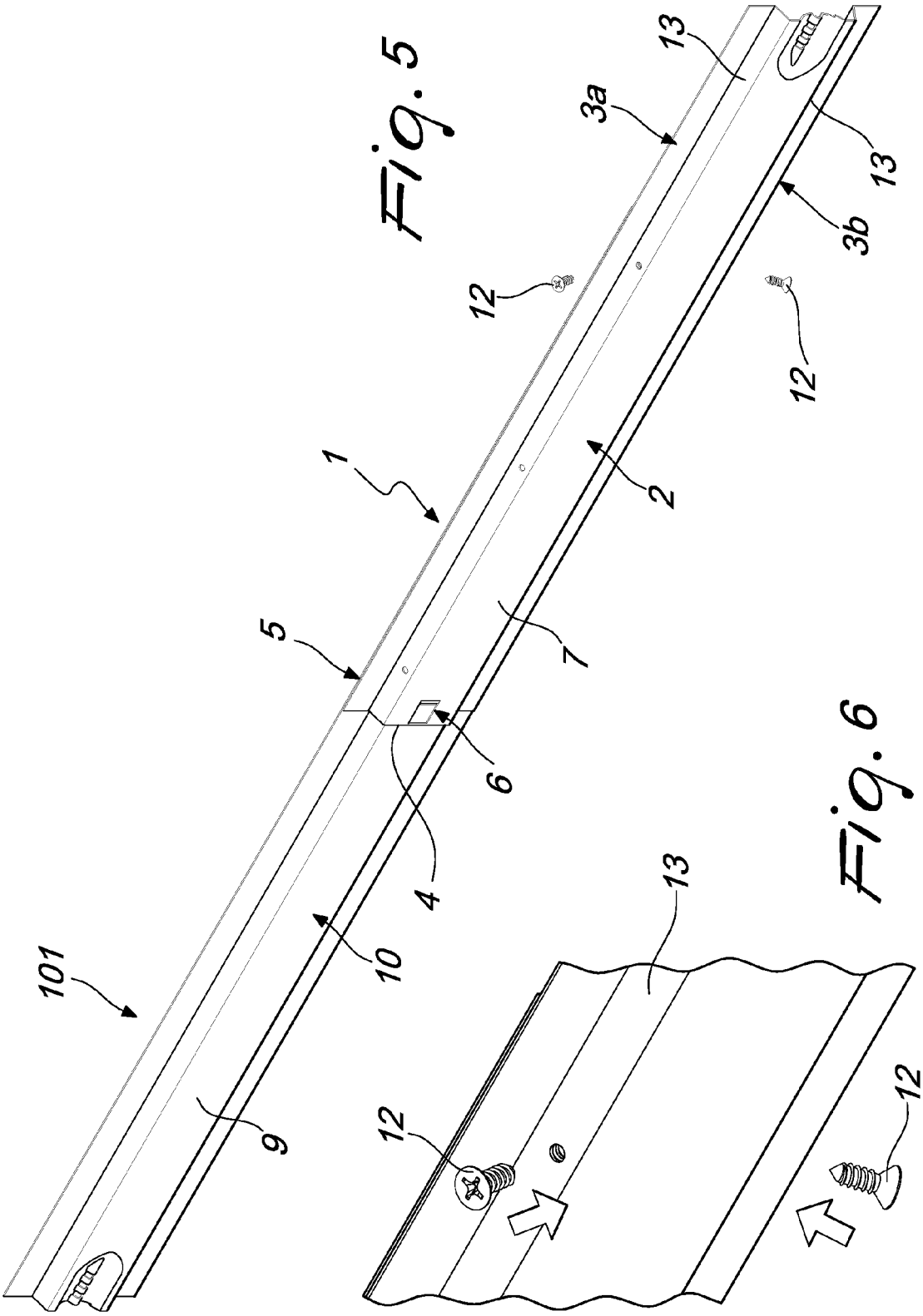

Fig. 5

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 14 19 5767

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2007/076569 A1 (PILZ GAIL MAREE [AU]; PILZ ANTON [AU]) 12 July 2007 (2007-07-12) * figures 1-3, 5 * * page 5, line 19 - line 30 * * page 6, line 14 - line 21 * * page 6, line 25 - line 27 * -----	1-13	INV. E06B3/46

TECHNICAL FIELDS SEARCHED (IPC)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 May 2015	Cobusneanu, D

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007076569 A1	12-07-2007	AU 2006200002 B1	21-09-2006
		WO 2007076569 A1	12-07-2007

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

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