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(54) **FRAME FOR SLIDING DOORS**

(57) A frame (10) for sliding doors, which comprises, with respect to its installation configuration:

- a profiled front post (11), against which a door leaf (12) is adapted to abut for closure,
- a profiled upper lintel (13), to be joined at one end thereof to the upper end of the front post (11),
- two mutually opposite profiled intermediate posts (14), in an intermediate position of the upper lintel (13) and defining between them an inlet for the door leaf (12),
- at least one profiled element (17) for extending the transverse cross-section of at least one, or of at least one portion, of the front post (11), the upper lintel (13), and the intermediate posts (14), with which it can be coupled by snap action.

The profiled element (17) is adapted to be installed with an extension portion (18) which is substantially coplanar with a surface of the entryway (19) of the sliding door and substantially up to the wall surface that is directed toward the side of a room.

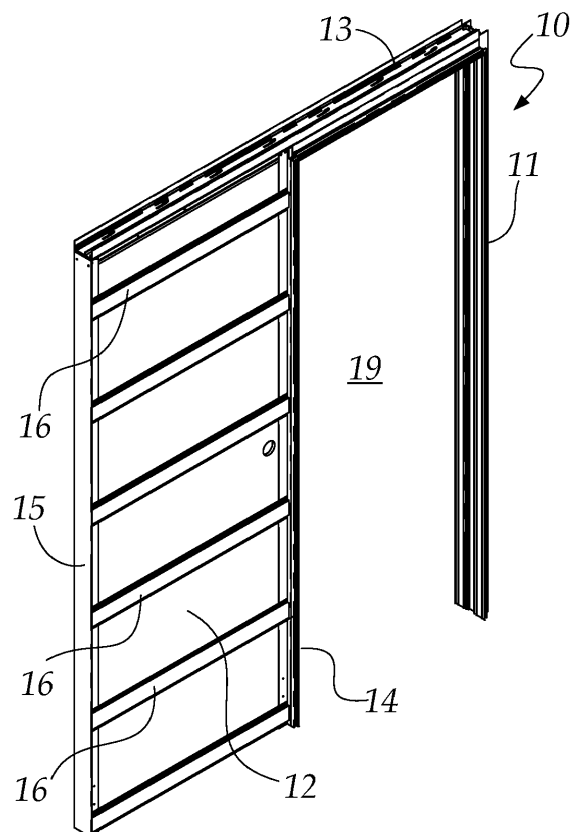


Fig.2

Description

[0001] The present invention relates to a frame for sliding doors.

[0002] Sliding doors are constituted by one or by two sliding door leaves on a framework and are of the "inside-the-wall" type, which retract inside the wall, or of the "outside-the-wall" type.

[0003] In particular, in "outside-the-wall" doors the door leaves slide along a visible track which is fixed at least partially above the entryway, and are arranged so as to slide between the entryway and a wall contiguous with such entryway, while remaining always visible.

[0004] By contrast, in "inside-the-wall" doors the door leaves slide along a hidden track, which is fixed at least partially above the entryway, and are arranged so as to slide between the entryway and an accommodation box contiguous with such entryway. This box is adapted to conceal the presence of the door leaves when the door is in the open configuration.

[0005] Typically the box is made with surfaces, usually of plasterboard, and with a frame, usually made of metallic material (preferably aluminum), fixed to the original entryway.

[0006] Taking for example a sliding door with a single door leaf, normally the frame has two end posts which are constituted by adapted profiled elements arranged vertically, which support an upper profiled element which contains the sliding track for the door leaf. In a central position there are two facing vertical profiled elements, for supporting this same upper profiled element, which are adapted to define the limit of the entryway and the inlet of the box into which the door leaf retracts, and are therefore spaced apart so as to allow the passage of the sliding door leaf. Substantially horizontal crossmembers are fixed between one of the two end posts and each one of the two opposing central profiles to reinforce the structure of the box. In addition or as an alternative to the crossmembers, metal plates can be used. Externally, the structure of the box is covered by plasterboard panels, resulting in surfaces flush with those of the wall.

[0007] The plasterboard structure can be provided in a single or double slab; the latter is typically chosen for better acoustic (soundproofing) performance and solidity of the wall.

[0008] Such known art is not devoid of drawbacks, such as the fact that the frames cannot be adapted for single and for double plasterboard slabs, as a consequence requiring diversified products and hence considerable warehouse storage for the corresponding elements.

[0009] The aim of the present invention is to provide a frame for sliding doors which is capable of improving the known art in one or more of the above mentioned aspects.

[0010] Within this aim, an object of the invention is to provide a frame for sliding doors that is adaptable to installation both with single and with double plasterboard slabs.

[0011] Another object of the invention is to provide a frame for sliding doors that can be installed flush with the wall even with double plasterboard slabs.

[0012] Furthermore, the present invention sets out to overcome the drawbacks of the background art in a manner that is alternative to any existing solutions.

[0013] Another object of the invention is to provide a frame that is highly reliable, easy to implement and of low cost.

[0014] This aim and these and other objects which will become better apparent hereinafter are achieved by a frame for sliding doors, which comprises, with respect to its installation configuration:

- a profiled front post, against which a door leaf is adapted to abut for closure,
- a profiled upper lintel, to be joined at one end thereof to the upper end of said front post,
- two mutually opposite profiled intermediate posts, in an intermediate position of said upper lintel and defining between them an inlet for said door leaf,

said frame being characterized in that it comprises at least one profiled element for extending the transverse cross-section of at least one, or of at least one portion, of said front post, said upper lintel, and said intermediate posts, with which it can be coupled by snap action, said profiled element being adapted to be installed with an extension portion which is substantially coplanar with a surface of the entryway of said sliding door and substantially up to the wall surface that is directed toward the side of a room.

[0015] This aim and these and other objects which will become better apparent hereinafter are also achieved by an apparatus for a sliding door frame, which is characterized in that it comprises at least one profiled element to be coupled by snap action with a frame profiled element to be installed around the entryway of the sliding door, so as to define, for said frame profiled element, an extension of the transverse cross-section, substantially up to the surface, of a wall, which is directed toward the side of a room.

[0016] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the apparatus and of the frame according to the invention, which are illustrated by way of non-limiting example in the accompanying drawings wherein:

- Figure 1 is a front elevation view of the frame according to the invention;
- Figure 2 is a perspective view of the frame of Figure 1;
- Figure 3 is an enlargement of Figure 2;
- Figure 4a is a transverse cross-sectional view of a portion of upper lintel;
- Figure 4b is a transverse cross-sectional view of a finishing profiled element;

- Figure 4c is a cross-sectional view of the profiled element;
- Figure 4d is a transverse cross-sectional view of the intermediate posts;
- Figure 4e is a transverse cross-sectional view of the front post;
- Figure 5 is a perspective view of the profiled element;
- Figure 6 is a transverse cross-sectional view of the upper lintel in the installation with a single plasterboard slab;
- Figure 7 is a transverse cross-sectional view of the upper lintel, taken along the line VII-VII of Figure 1;
- Figure 8 is a transverse cross-sectional view of the upper lintel in the installation with double plasterboard slabs, taken along the line VIII-VIII of Figure 1;
- Figure 9 is a transverse cross-sectional view, like the previous figure, taken along the line IX-IX of Figure 1;
- Figure 10 is a transverse cross-sectional view, like the previous figure, taken along the line X-X of Figure 1.

[0017] With reference to the figures, the frame according to the invention, generally designated by the reference numeral 10, comprises, with respect to its installation configuration:

- a profiled front post 11, against which a door leaf 12 is adapted to abut for closure,
- a profiled upper lintel 13, to be joined at one end thereof to the upper end of the front post 11,
- two mutually opposite profiled intermediate posts 14, in an intermediate position of the upper lintel 13 and defining between them an inlet for the door leaf.

[0018] The above mentioned elements are designated in the views in Figure 1 and in Figure 2.

[0019] In particular, Figure 1 shows the frame 10 according to the invention in a front elevation view and with the door in the closed position, in which the door leaf 12 is in abutment against the front post 11; Figure 2 shows the same frame 10 in a perspective view, with the door in the open position, in which the door leaf 12 is inside a box defined by a framework and by panels (not shown).

[0020] The term "front" here means the side of the frame against which the door leaf 12 is adapted to come into abutment and the term "rear" indicates the opposite side.

[0021] As can be seen from Figures 1 and 2, there is also a rear post 15, which is also profiled, and this and the front post 11 define the ends of the frame 10 and between them there is the upper lintel 13, which defines its height. A part of the frame 10, enclosed by panels, defines the above mentioned box, for accommodating the door leaf 12 when the door is in the open position.

[0022] The two intermediate posts 14 are fixed in an upper region to the upper lintel 13.

[0023] A plurality of cross-members 16, horizontal in

the configuration for use, are comprised between the rear post 15 and the respective intermediate posts 14, in pairs and mutually opposite. In this manner a first cross-member 16 is fixed to a first intermediate post 14 and the next second cross-member 16 is fixed to a second intermediate post 14 so as to provide the frame of the box, which needs to be finished with a plurality of panels, not shown in the figures, for example made of plasterboard, wood or the like.

[0024] The frame 10 is preferably made of aluminum and of the height-adjustable and width-adjustable type, in order to allow an application to any size of the entryway of the door.

[0025] The term "height" indicates the vertical length of the frame 10 parallel to the direction of extension of the front 11 and rear 15 posts.

[0026] The term "width" means the horizontal length of the frame 10 parallel to the direction of extension of the upper lintel 13 in the configuration for use.

[0027] Adjustment occurs in a conventional manner, for example using profiled members that have a series of notches or signs which define various lengths in order to facilitate the cutting thereof by operators during installation, or via the use of extensions of the various profiled members, to be joined using bolts or using pins. In this manner the elements can be adapted both to entryways of standard width and height, and to entryways where the width and height are oversized or undersized.

[0028] By "standard" measurements what is meant is the measurements for a frame corresponding to a standard entryway. These measurements vary from country to country and therefore the measurements of the country where the frame is installed must be considered.

[0029] By way of non-limiting example, the standard measurements for a door in Italy are: width 815-835 mm, height 2010-2100 mm.

[0030] The frame 10 according to the invention has a peculiarity in that it comprises at least one profiled element 17 for extending the transverse cross-section of at least one, or of at least one portion, of the front post 11, the upper lintel 13, and the intermediate posts 14, with which it can be coupled by snap action.

[0031] In particular, the profiled element 17 is adapted to be installed with an extension portion 18 which is substantially coplanar with a surface of the entryway 19 of the sliding door and substantially up to the wall surface that is directed toward the side of a room.

[0032] The cross-sections in Figures 4a-4b, 4d and 4e show the principal components of the frame 10 that can be extended with the profiled element 17, the latter being shown in Figure 4c.

[0033] The upper lintel 13 comprises a profiled element 20 which is double U-shaped in cross-section, shown individually in Figure 4a, and at least one finishing profiled element 21, shown individually in Figure 4b, to be joined to the previous profiled element.

[0034] In particular, the double U-shaped profile 20 has an upper U-shaped portion 20a and a lower U-shaped

portion 20b so as to define two channels which are open respectively upward and downward in the installation configuration. On the outer part of at least one of the opposite sides of the lower U-shaped portion 20b, the lintel 13 also comprises the finishing profiled element which is substantially L-shaped in cross-section and can be coupled by snap action with the double U-shaped profile 20. Two finishing portions 21 can be joined to the U-shaped portion 20, one per side.

[0035] The profiled element 17, which is shown in cross-section in Figure 4c and in a perspective view in Figure 5, is in turn associable by snap action on the outer side of each finishing profiled element 21.

[0036] The finishing profiled element 21 comprises a substantially flat finishing portion 22 which is coplanar and can be extended with the extension portion 18 of the profiled element 17.

[0037] The finishing portion 22, in the configuration of installation of the upper lintel 13, extends substantially on the same plane as the surface of the entryway.

[0038] Figure 6 is a cross-sectional view of the upper lintel 13, with the double U-shaped profile 20 and two finishing profiled elements 21 on opposite sides of the double U-shaped profile. This configuration is preferably to be used in the installation of a frame 10 in a structure with a single slab of plasterboard (or wood or the like). In this case the finishing portion 22, in addition to extending along the same plane as the surface of the entryway, ends substantially proximate to the wall surface that is directed toward the side of a room, which is the wall surface with the plasterboard, so as to provide a finish that is flush with the wall.

[0039] Figure 8 on the other hand is a cross-sectional view taken along the line VIII-VIII of Figure 1. Figure 1 and Figure 2 show frames installed in a structure with double plasterboard slabs.

[0040] Differently from the previous case, installation of the profiled element 17 is necessary in order to provide an extension of the finishing portion 22 with the extension portion 18. In this case, it is the extension portion 18 that extends up to the wall surface that is directed toward the side of a room, which is the wall surface with the second, outermost plasterboard panel, so as to provide the finish flush with the wall.

[0041] Figure 7 shows a cross-section of the lintel 13 taken along the line VII-VII. In this part of the frame, the finishing profiled elements 21 are not necessary and neither are the profiled elements 17, since it is a non-visible part and defines the space of the box into which the door leaf retracts.

[0042] By contrast, a self-supporting track 25 is shown inside the lower U-shaped portion 20b, which has a channel for a rail on which trolleys fixed to the upper portion of the door leaf 12 are adapted to slide.

[0043] The track 25 and the double U-shaped profile 20 are coupled using elements 32 of the track 25 that are adapted to be inserted into corresponding openings in the profiled element, so as to obtain a bayonet coupling,

as can also be seen in the enlargement in Figure 3. On the double U-shaped profile 20 there is also an appendage-shaped portion 33, in cross-section, which has a height shorter than that of the walls of the upper U-shaped portion 20a (which are adapted to extend the height of the structure of the wall outside the frame), and is adapted to ensure the elements 32 have the minimum height necessary to operate after installation, and to prevent the structure outside the frame from obstructing the insertion of the track 25 with the elements 32, which would risk compromising its coupling system.

[0044] The front post 11, as shown in the cross-section in Figure 4e, is substantially U-shaped in cross-section, with mutually opposite finishing portions 23, each one of which is substantially flat, coplanar, and can be extended with an extension portion 18 of a respective profiled element 17. In this way it is possible to obtain a finish that is flush with the wall, both for a structure with a single plasterboard panel, without the use of the profiled element 17, and also for a structure with double panels, with the use of the profiled element 17, possibly one for each side of the post 11, as shown in the cross-section of Figure 10.

[0045] The front post 11 is an abutment profile for the surrounding plasterboard structure, such that it perfectly embraces the posts, preferably standard 75 mm posts, thus avoiding misalignments.

[0046] Each one of the intermediate posts 14, shown in Figure 4d, is substantially L-shaped in cross-section and has a finishing portion 24, correspondingly with one side of the cross-section, which is substantially flat, coplanar, and can be extended with the extension portion 18 of the profiled element 17.

[0047] For installation with double plasterboard slabs, it is necessary to use a profiled element 17. Figure 9 shows the use of an element 17 for each intermediate post 14, therefore with double plasterboard slabs for each side of the wall structure, both the side facing toward one room and the side facing toward the other room, the two rooms being connected via the entryway.

[0048] The profiled element 17, as can be seen in the cross-sectional views and also in the perspective view, has a snap-acting engagement portion 26 with two elastically deformable parallel tabs 17 which have, at the free end, a respective protrusion 28 for anchoring in a substantially groove-shaped coupling portion 29 defined on at least one side of a frame profiled element, at least one of the front post 11, the upper lintel 13, and the intermediate posts 14.

[0049] The invention also relates to an apparatus for a sliding door frame, which comprises at least one profiled element 17 to be coupled by snap action with a frame profiled element (i.e. the front post 11 and/or the upper lintel 13 and/or the intermediate posts 14) to be installed around the entryway 19 of the sliding door, so as to define, for the frame profiled element 11, 13, 14, an extension of the transverse cross-section, substantially up to the surface, of a wall, which is directed toward the side of a

room.

[0050] As described, the profiled element 17 comprises an extension portion 18, which defines the extension, that is substantially flat and coplanar with a surface of the entryway 19 of the sliding door and is provided with the snap-acting engagement portion 26 with the two tabs 27.

[0051] As can be seen in the cross-sections in Figures 4b, 6 and 8, the finishing profiled element 21 has two protrusions 21a and 21b, one of which is at the end of an appendage of the base of the L-shape, and another is at the upper end thereof, with which it can be inserted by snap action into corresponding seats 20c and 20d (indicated in Figure 4a) of the double U-shaped profile 20.

[0052] Each finishing profiled element 21, present at each side of the double U-shaped profile 20, has a seat 30 that is inclined with respect to the door leaf for the insertion of a brush 31 that extends linearly and parallel to the direction of sliding of the door leaf 12. The inclined brush, the use of which is already known, is adapted to obstruct the diffusion of light originating from the environment beyond the door leaf, when the door is in the closed position. As an alternative to the brush, it is possible to use a gasket.

[0053] The intermediate posts 14 also have, on the inside, i.e. opposite from the coupling portion 28, a seat for the insertion of a brush, shown in Figure 9 and here also indicated with 31.

[0054] The apparatus can also comprise an angular bracket 34, to be used as shown in the enlargement in Figure 3 in order to ensure the positioning of the posts and the lintel at 90°: therefore, at the upper corner of the entryway 19, between a profiled element 17 of the front post 11 and the profiled element of the lintel 13, and at the other upper corner of the entryway, between a profiled element 17 of an intermediate post 14 and the profiled element of the lintel 13. In the same way, brackets can be used on the side directed toward the other room.

[0055] In the same view, note that the transverse cross-sections of the posts, front 11 and intermediate 14, have a narrowing of the cross-section at the upper end zones, and so also the lintel 13 at the end zone at the front post 11, for coupling those elements. In these zones there are no coupling portions 29, therefore the profiled elements 17 have a shorter length than the other frame elements to which they need to be coupled.

[0056] The same combination of elements, in order to recreate a finish that is flush with the wall with double plasterboard slabs, can be reproduced on one side of the door only, i.e. toward one room, or toward both rooms.

[0057] It should be noted that the frame 10 according to the invention is capable of ensuring an installation that is flush with the wall with a single plasterboard slab and, simply by virtue of the addition of profiled elements 17 for extension, which can be sold separately from the frame for a single slab, is also suitable for installation with double plasterboard slabs, while still ensuring that the finish is flush with the wall.

[0058] Furthermore, the perimetric profiles that make up the frame act as a guide for the surrounding plasterboard wall, in that it allows the insertion and alignment thereof without needing further verifications, like the front post 11 with its U-shaped profile or the upper lintel 13 with its double-U shape and the appendage-shaped portion 33.

[0059] Use of the frame and of the apparatus, according to the invention, is evident from the foregoing description and explanation and, in particular, it is evident that the frame, by virtue of the apparatus and of the particular shape in cross-section of its elements, is adaptable to installation both with a single plasterboard slab and with double plasterboard slabs, while still ensuring a finish that is flush with the wall.

[0060] In practice it has been found that the invention fully achieves the intended aim and objects by providing a frame for a finish flush with the wall with a single plasterboard slab which is easily adaptable to a wall structure with double plasterboard slabs, while still ensuring the same finish and without incurring in installation errors, both during the modification of the width and height of the frame, and during the installation of the various elements on the wall structure.

[0061] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0062] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0063] The disclosures in Italian Patent Application No. 10202000029165 from which this application claims priority are incorporated herein by reference.

[0064] 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 frame for sliding doors, which comprises, with respect to its installation configuration:

- a profiled front post (11), against which a door leaf (12) is adapted to abut for closure,
- a profiled upper lintel (13), to be joined at one end thereof to the upper end of said front post (11),
- two mutually opposite profiled intermediate posts (14), in an intermediate position of said upper lintel (13) and defining between them an

inlet for said door leaf (12),

said frame (10) being **characterized in that** it comprises at least one profiled element (17) for extending the transverse cross-section of at least one, or of at least one portion, of said front post (11), said upper lintel (13), and said intermediate posts (14), with which it can be coupled by snap action, said profiled element (17) being adapted to be installed with an extension portion (18) which is substantially coplanar with a surface of the entryway (19) of said sliding door and substantially up to the wall surface that is directed toward the side of a room.

2. The frame according to claim 1, **characterized in that** said upper lintel (13) comprises a profiled element (20) which is double U-shaped in cross-section, with an upper U-shaped portion (20a) and a lower U-shaped portion (20b) so as to define two channels which are open respectively upward and downward in the installation configuration, on the outer part of at least one of the opposite sides of said lower U-shaped portion (20b) said lintel (13) also comprising a finishing profiled element (21) which is substantially L-shaped in cross-section and can be coupled by snap action with said double U-shaped profile (20), and said profiled element (17) being associable by snap action on the outer side of said finishing profiled element (21).
3. The frame according to one or more of the preceding claims, **characterized in that** said finishing profiled element (21) comprises a substantially flat finishing portion (22) which is coplanar and can be extended with said extension portion (18) of said profiled element (17).
4. The frame according to one or more of the preceding claims, **characterized in that** said front post (11) is substantially U-shaped in cross-section, with mutually opposite finishing portions (24), each one of which is substantially flat, coplanar, and can be extended with said extension portion (18) of said profiled element (17).
5. The frame according to one or more of the preceding claims, **characterized in that** each one of said intermediate posts (14) is substantially L-shaped in cross-section and has a finishing portion (24), correspondingly with one side of the cross-section, which is substantially flat, coplanar, and can be extended with said extension portion (18) of said profiled element (17).
6. The frame according to one or more of the preceding claims, **characterized in that** said profiled element (17) has a snap-acting engagement portion (26) with two elastically deformable parallel tabs (27) which

have, at the free end, a respective protrusion (28) for anchoring in a substantially groove-shaped coupling portion (29) defined on at least one side of a frame profiled element, which is represented by at least one of said front post (11), said upper lintel (13), and said intermediate posts (14).

7. An apparatus for a sliding door frame, **characterized in that** it comprises at least one profiled element (17) to be coupled by snap action with a frame profiled element (11, 13, 14) to be installed around the entryway (19) of the sliding door, so as to define, for said frame profiled element (11, 13, 14), an extension of the transverse cross-section, substantially up to the surface, of a wall, which is directed toward the side of a room.
8. The apparatus according to claim 7, **characterized in that** said profiled element (17) comprises an extension portion (18), which defines the extension, is substantially flat, and coplanar with a surface of the entryway (19) of said sliding door.
9. The apparatus according to one or more of claims 7 and 8, **characterized in that** said profiled element (17) has a snap-acting engagement portion (26) with two elastically deformable parallel tabs (27) which have, at the free end, a respective protrusion (28) for anchoring in a substantially groove-shaped coupling portion (29) defined on at least one side of said frame profiled element (11, 13, 14).

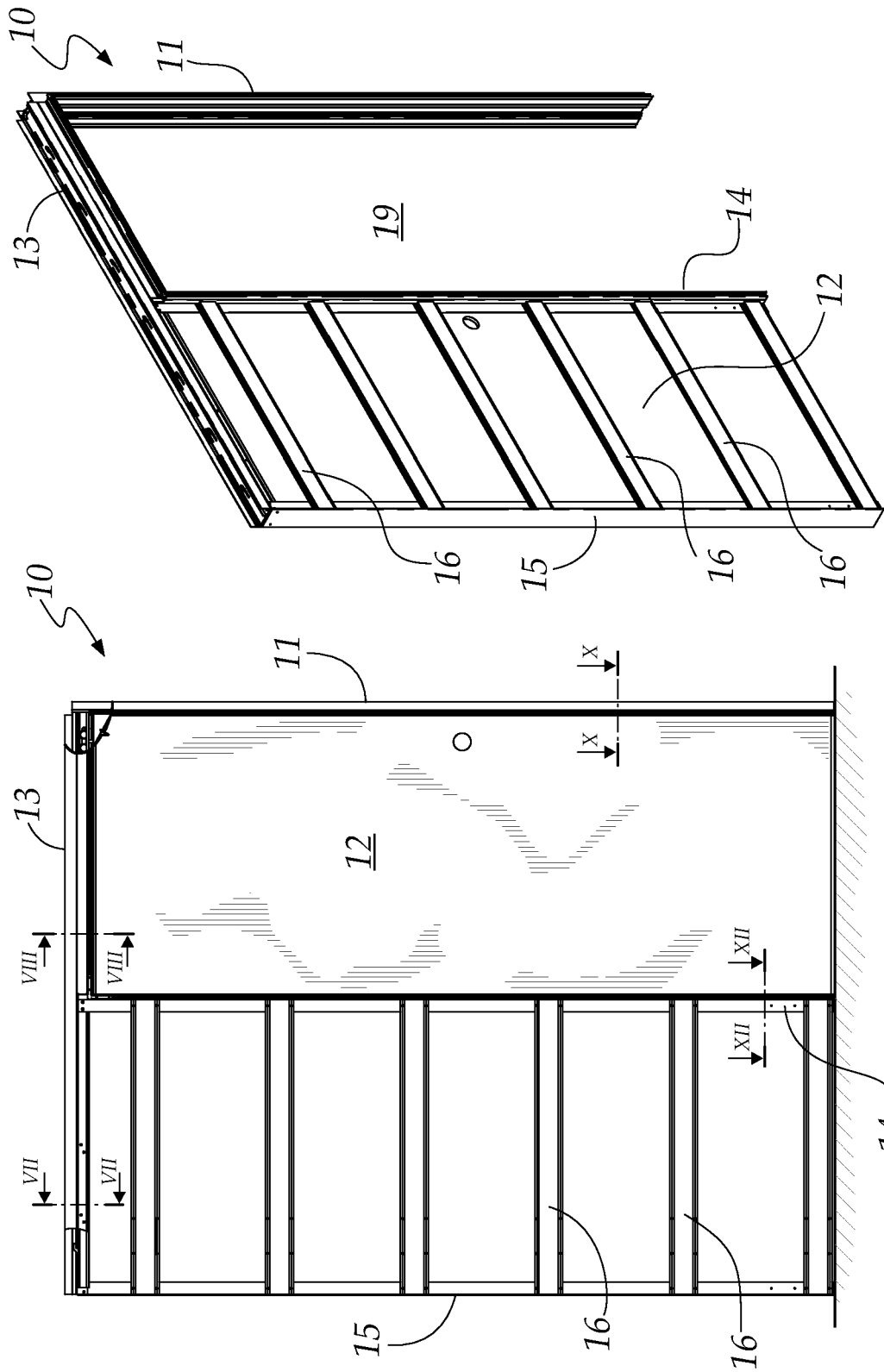
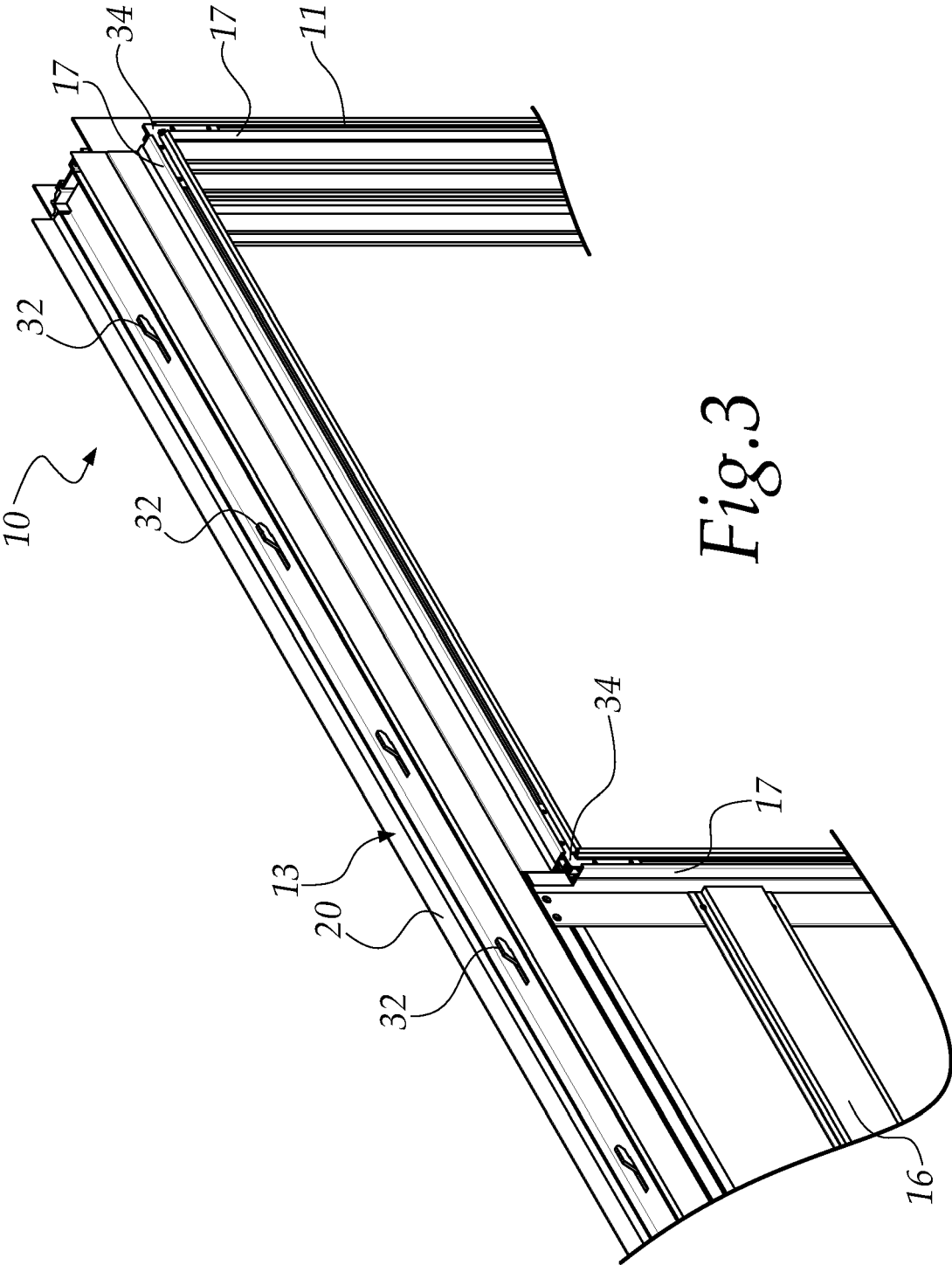
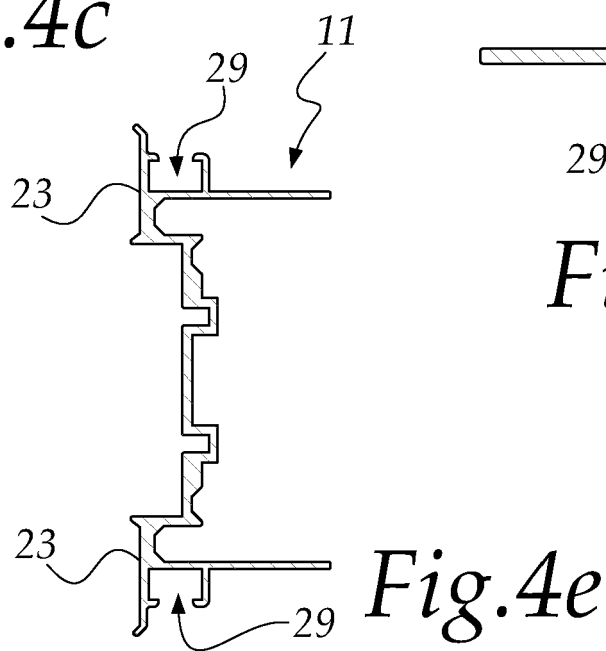
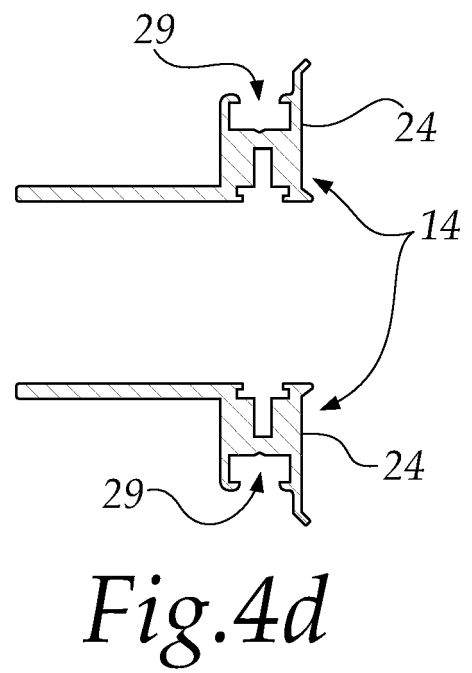
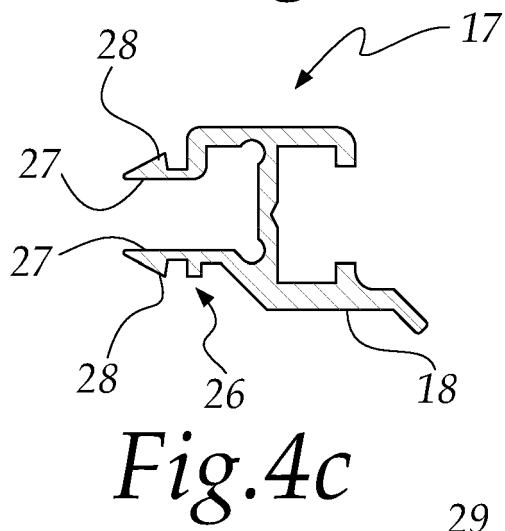
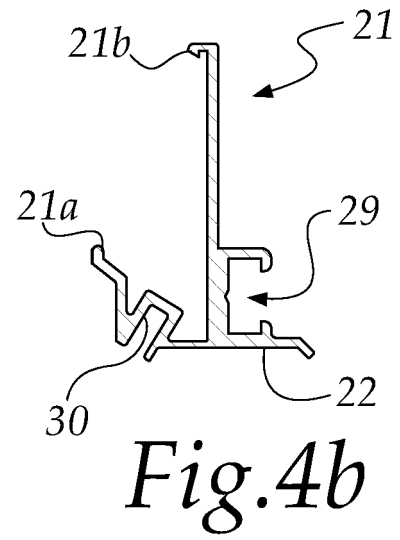
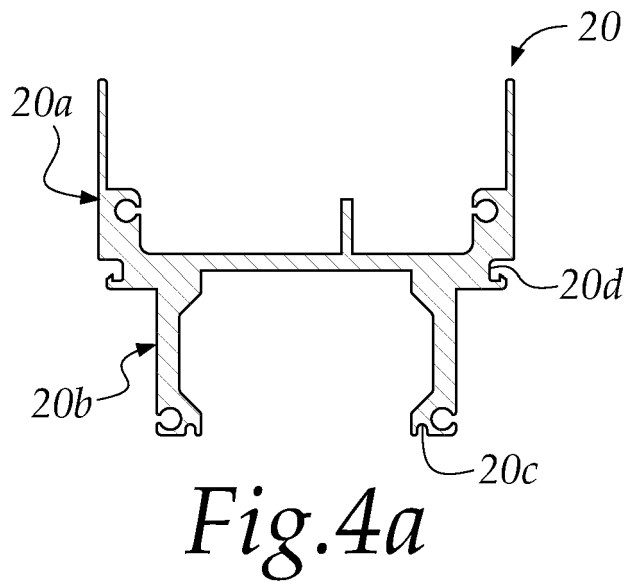


Fig. 2

Fig. 1





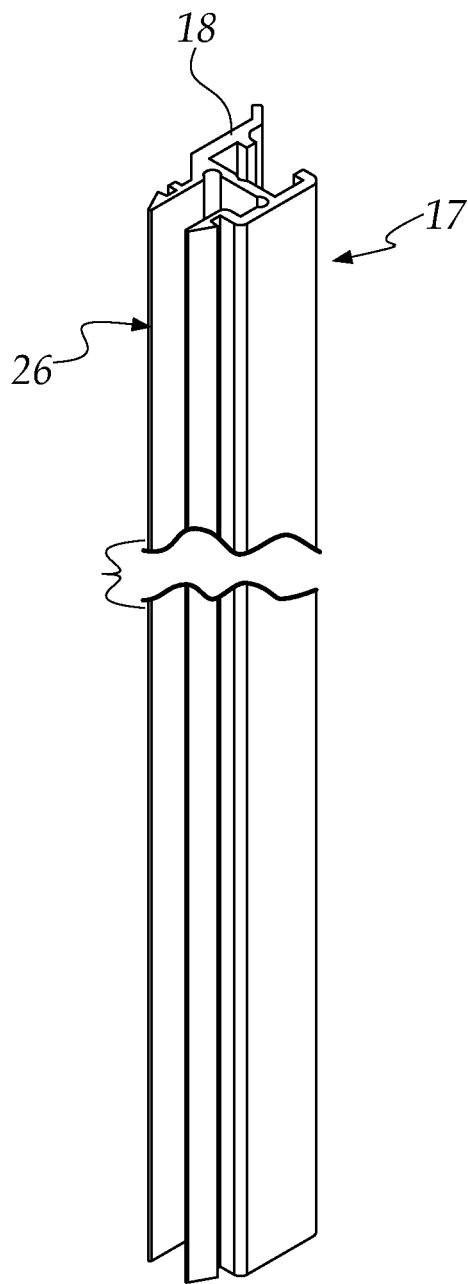


Fig. 5

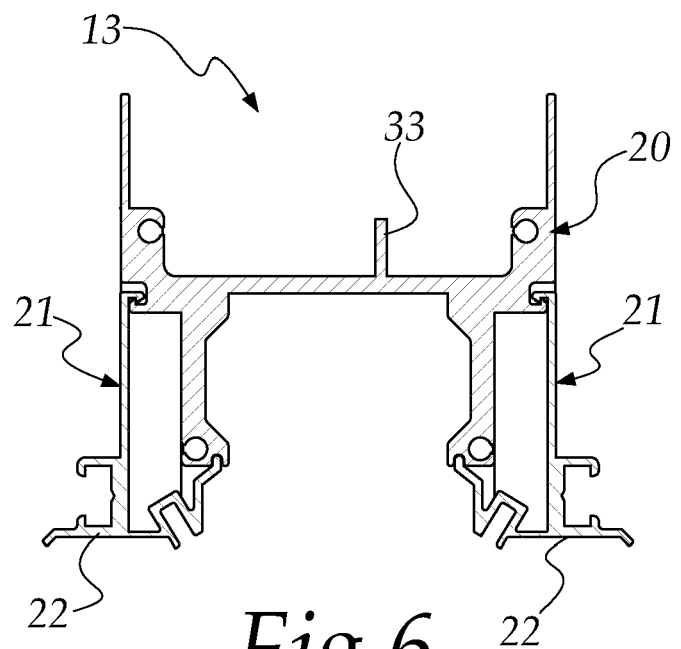
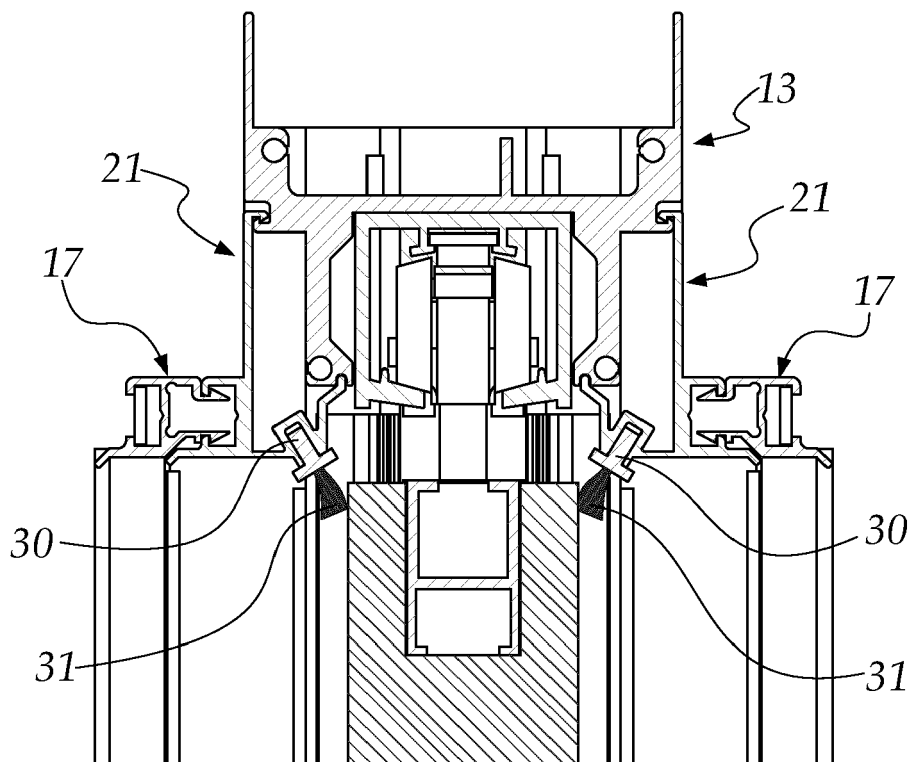
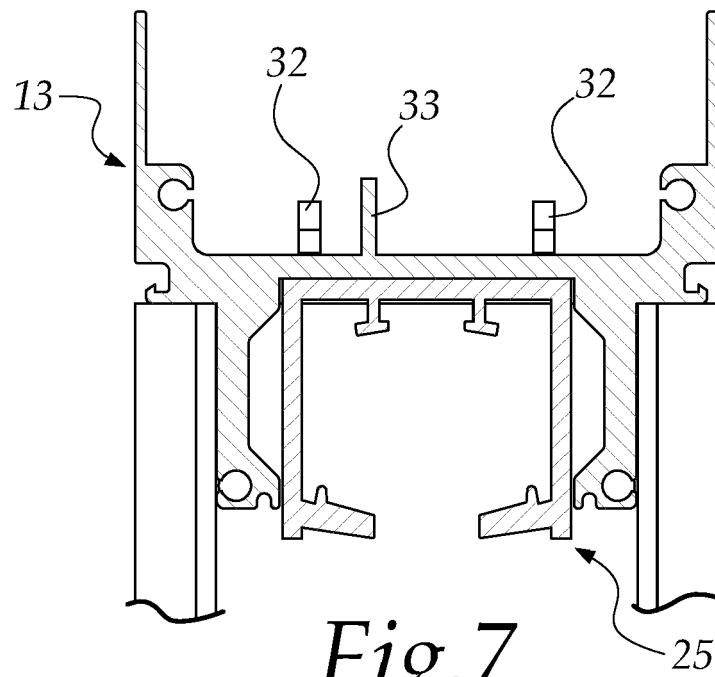
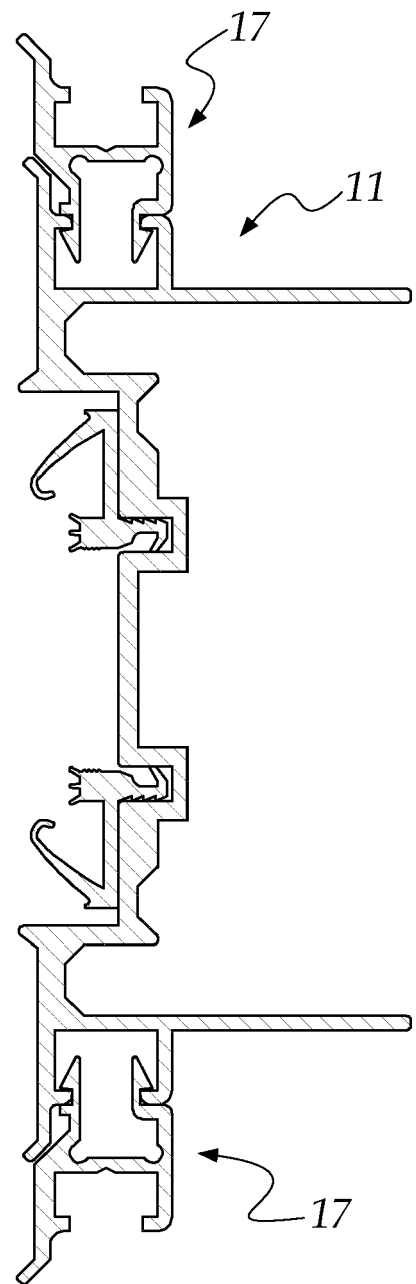
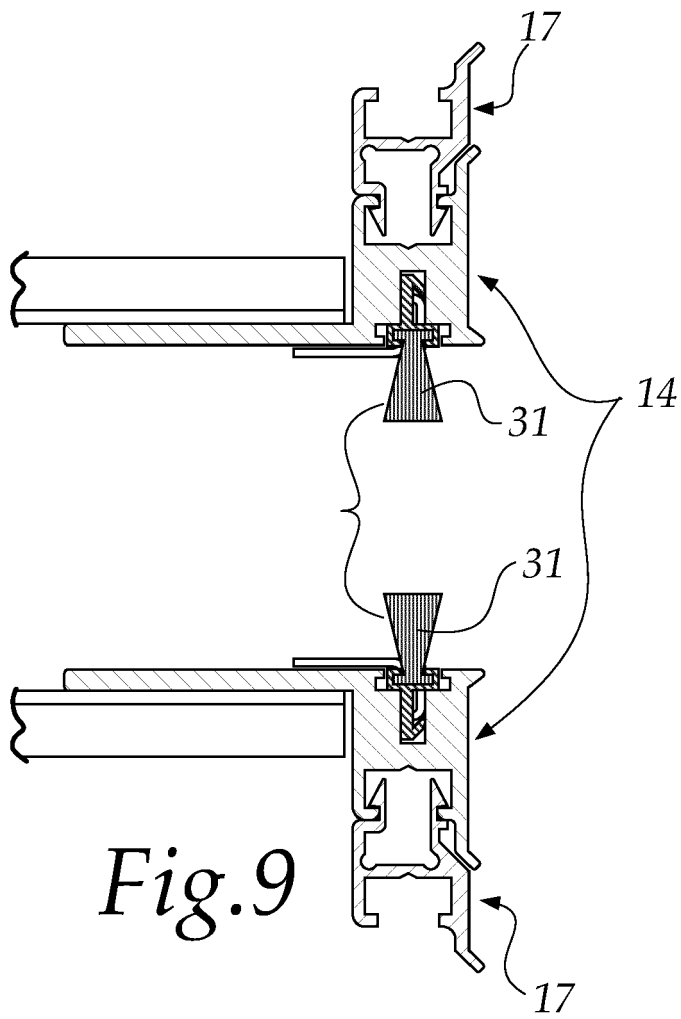


Fig. 6







EUROPEAN SEARCH REPORT

Application Number

EP 21 20 3754

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	GB 2 062 734 A (VOSS L L MOBEL & TREVARE) 28 May 1981 (1981-05-28) * figures *	1, 7-9	INV. E06B3/46
X	EP 3 575 538 A1 (PROMANI SRL [IT]) 4 December 2019 (2019-12-04) * figures 1-3 *	1, 4, 5, 7-9	
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A	EP 2 924 222 A1 (ECLISSE SRL [IT]) 30 September 2015 (2015-09-30) * the whole document *	1-9	
			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		13 April 2022	Verdonck, Benoit
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