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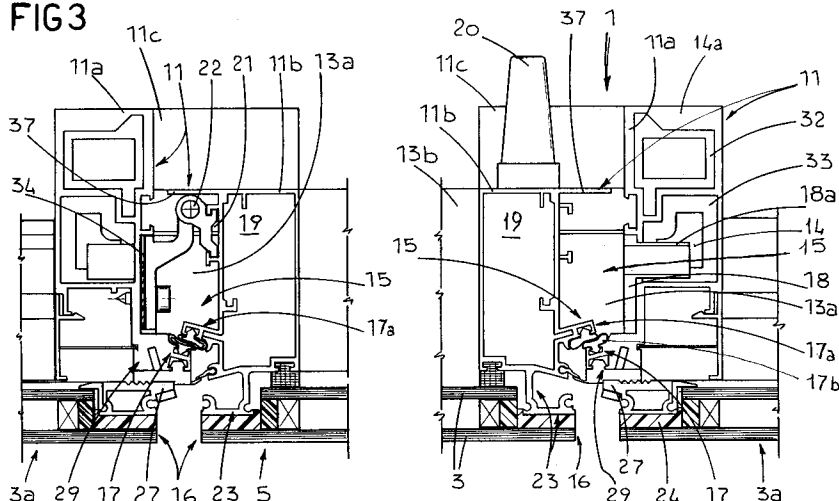
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I-47037 Rimini (Forli) (IT)**(54) **Continuous facade for buildings with a structural lattice bearing units of glass panes with fixed and inwardly openable structural frames.**

(57) The invention relates to a continuous facade for buildings, with a structural lattice (1) bearing glass units (3, 3a) with fixed and inwardly-openable structural frames comprising, along the vertical (V) and horizontal (O) lines described by the sides of each space (5) destined to house inwardly-opening glass unit (3), uprights (11) and crossbars (13) equipped respectively with a vertical continuous conduit (14) and a horizontal channel (15) communicating bilaterally with the said conduit (14), in such a way as to

permit the draining of infiltrated water to the inside of the structural lattice (1), each said upright (11) being vertically divisible into mobile uprights (11b) and fixed uprights (11a), in the same way as the crossbars (13), horizontally divisible into mobile crossbars (13b) which, together with the mobile uprights (11b) constitute the structural frame of the inwardly-opening glass unit (3) and fixed crossbars (13a) which, together with the fixed uprights (11a) constitute the counterframe of the glass unit (3) itself.

FIG3**EP 0 591 597 A1**

The invention relates to a continuous facade for buildings, with a structural lattice bearing units of glass panes with structural frames.

Structural lattices of a continuous facade are usually defined as a metallic facade lattice, which can be of a single pane of glass, if destined to cover a wall panel, or be double-glazed if instead destined to occupy a window-space. The said windows are however supported by a metallic frame, usually made of aluminium, with the interpositioning of a special sealant known generally as "structural silicone".

In substance, therefore, each glass unit comprises a metallic frame, which bears the glass itself by means of the structural silicone. These frames, called structural frames, are then associated to the structural lattice itself.

The above-mentioned facades have always presented the problem of sealing effectively against water and other climactic disturbances. For this reason the space between one unit of glass and another has always been kept to an absolute minimum.

Normally the said space is referred to as an "architectural fugue". Also for aesthetic reasons the architectural fugue is kept as far as possible to a minimum. Normally, therefore, the uprights and crossbars of the said continuous facades are arranged symmetrically with respect to the architectural fugues, and evidently are much larger than an architectural fugue. This means that, when projecting openable glass units, it is absolutely necessary to envisage an opening towards the outside, since opening towards the inside would be in any case prevented by the interference of the peripheral edge of each unit with the internal structural lattice. Also, in the prior art structures illustrated, waterproofing is guaranteed, with the water flowing entirely on the external part of the facade, as it finds the uprights and crossbars, apart from the architectural fugues, insurmountable obstacles.

The prior art continuous facades, while considered very effective, present the considerable drawback of having to be cleaned from the outside, which, as is well-known, implies high cleaning costs.

Another disadvantage is the possibility only of limited aeration, the opening possibility of the glass units being very limited, and then only outwardly.

The aim of the present invention is thus that of eliminating the above drawbacks. The technical problem challenged by this invention is that of how to create a continuous facade with glass units having structural frames as defined above, of which some are fixed, but others have the possibility of opening towards the inside, without the facade suffering some disadvantage because of this. The continuous facade of the present invention main-

tains a perfect seal both against water and other atmospheric agents and at the same time maintains invaried and within the minimum limits (18mm) the dimensions of the horizontal and vertical architectural fugues of the entire facade, thus not altering the general architectural effect.

Further, the facade offers the considerable advantage of permitting the cleaning of all of the glass units from the inside, even the fixed units, through the openings of the inwardly-openable windows.

Better aeration and externalwards view are also made possible, and a great flexibility of the facade is also envisaged, there being various project forms available, such as fixed glass units alternated with inwardly-openable ones, and it is obviously possible to adapt usual opening forms.

The invention, as it is characterised in the claims, solves the above-mentioned technical problem and permits of achieving the above-mentioned advantages.

Further characteristics and advantages of the present invention will better emerge from the detailed description that follows, made with reference to the accompanying drawings, which represent a preferred embodiment here illustrated in the form of a non-limiting example, and in which:

- Figure 1 shows a schematic frontal view of the facade;
- Figure 2 shows a view according to the section line II-II of figure 1;
- Figure 3 shows a further view according to the section line III-III of figure 1;
- Figure 4 shows a view according to the section line IV-IV of figure 1;
- Figure 5 shows a view according to the section line V-V of figure 1;
- Figure 6 shows a view according to the section line VI-VI of figure 2.

According to the present invention, the continuous facade of buildings, object of the invention, is of the type comprising a structural lattice 1 bearing glass units 3a having fixed or mobile frames and is distinguished by the fact of having inwardly openable glass units 3. Conceptually, the structural lattice 1 comprises, along the vertical and horizontal lines (V,O) identified in the sides of each space 5 destined to house a corresponding inwardly-opening glass unit 3:

- uprights 11 equipped with a continuous vertical conduit 14 which uprights 11, at least corresponding to the space 5, but preferably along their entire length, divide vertically into mobile uprights 11b and fixed uprights 11a which comprise the said conduit 14;
- crossbars 13 which, corresponding to the space 5, horizontally divide into mobile crossbars 13b, which, together with the mobile

uprights 11b constitute the structural frame of the inwardly-opening glass unit 3, and fixed crossbars 13a which, together with the fixed uprights 11a constitute the counterframe of the inwardly-opening glass unit 3, at least the lower fixed crossbars 13a exhibiting a horizontal channel 15, communicating bilaterally with the said conduits 14 of the uprights, where the draining of the infiltrated water collected by the said horizontal channel 15 takes place. For this aim drainage accessories 18 of the horizontal channel 15 are envisaged, arranged sealedly on the extreme sides of the horizontal channel 15 and equipped with a short inclined conduit 18a inserted directly internally to the vertical conduit 14.

It is important to observe that the vertical and horizontal architectural fugues 16 described by all of the glass units 3 and 3a, those inwardly openable and those fixed or in any case with the usual type of opening, may reach lower limit values of equal to 18 mm. Indeed, the transversal dimensioning of the uprights 11 and crossbars 13, even if divided, is equal to that of traditional uprights and crossbars and the interstice between the structural frame and the counterframe of each openable glass unit 3 is limited to the space which is strictly necessary for the development of the ledges 17, realised on the fixed crossbars 11a and on the fixed crossbars 13a, and the strikers 17a, realised on the mobile uprights 11b and the mobile crossbars 13b, with at least one gasket 17b interplaced for the sealed closure of the opening glass unit 3.

These limited dimensions are obtainable, in particular, because of the invention's constructional particularities, which are now described.

The mobile uprights 11b of each structural frame comprise a tubular body 19 for containing, on one of the uprights, closing elements having a handle 20 externally applied, and exhibit also an external longitudinal housing 21 with the function of creating a constraint for a part of an articulation hinge 22 constrained, on the other side, in a seating 34 of a fixed crossbar 11a of the counter frame and thus comprised in the interstice between the structural frame and counterframe. Obviously also the mobile crossbars 13b are equally conformed, in order to have structural conformity in the structural frame. A frontal shaped zone 23 is present to support, with structural silicone 24, the inwardly-opening glass unit 3. Finally, the mobile uprights 11b and the said mobile crossbars 13b also comprise a posterior tab 37 to hide the ledges 17, the strikers 17a and the articulation hinges 22 from view from the inside.

The fixed crossbars 13a comprise a tubular strengthening body 25 and a frontal shaped zone

26 to meet and support a structural frame 27 of fixed glass units 3a; a longitudinal tab 28 defines, with the opposite and spaced wall of the said ledges 17, the horizontal channel 15. The fixed uprights 11a also comprise a frontal shaped zone 29 in order to meet and support a structural frame 27 of fixed glass units 3, located on the opposite side of the striker 17a.

The uprights 11 which, as previously mentioned, are all divisible along their entire length, are subdivided in the zones not occupied by the spaces 5 which house the inwardly-opening glass units 3, by a fixed upright 11a and a second tubular fixed upright 11c which is solidly constrainable to the first and specially strengthened by means of wall-thickening and by means of partition of its principal body into at least two tubular parts 14, 14a, one of which coincides with the conduit 14.

Further, each upright 11, in the interruptions relative to the joint zones 30 for thermal expansion, envisages joint sleeves 31, 32, 33, respectively along the tubular fixed upright 11c and along the tubular parts 14a, 14. The sleeve 33 relative to the conduit 14 is conformed with at least its superior edges 33a inclined, in order to ease the draining of the water and envisages an external peripheral annular throat 33b lying on a plane coincidental to that of the interruptions relative to the joint zones 30 and having a greater breadth than the said interruption in the uprights 11, so that a positioning fixing seal 33c of the sleeve 33 can be received in the interstice between the bottom of the external peripheral annular throat 33b and the upright 11 wall.

Also the tubular fixed uprights 11c comprise a frontal shaped zone 29a to meet and support a corresponding structural frame 27 of fixed or usual glass units 3a. Both the tubular fixed uprights 11c and 11a envisage a respective reciprocal-coupling wall 35 and 36, extending at the said frontal shaped zones 29 and 29a.

Claims

1. A continuous facade for buildings, with a structural lattice bearing units of glass with fixed and inwardly-openable structural frames, characterised by the fact that the structural lattice (1) comprises, along the vertical and horizontal lines (V,O) identified in the sides of each space (5) destined to house a corresponding inwardly-opening glass unit (3):
 - uprights (11) equipped with a continuous vertical conduit (14) which uprights (11), at least corresponding to the space (5), divide vertically into mobile uprights (11b) and fixed uprights (11a) which

- comprise the said conduit (14);
- crossbars (13) which, corresponding to the space (5), horizontally divide into mobile crossbars (13b), which, together with the mobile uprights (11b) constitute the structural frame of the inwardly-opening glass unit (3), and fixed crossbars (13a) which, together with the fixed uprights (11a) constitute the counterframe of the inwardly-opening glass unit (3), at least the lower fixed crossbars (13a) exhibiting a horizontal channel (15), communicating bilaterally with the said conduits (14) of the uprights, where the draining of the infiltrated water collected by the said horizontal channel (15) takes place.
2. A facade as in claim 1, characterised by the fact that the vertical and horizontal architectural fugues (16) described by all of the glass units (3) and (3a), may reach lower limit values of equal to 18 mm, the transversal dimensioning of the uprights (11) and crossbars (13), even if divided, being equal to that of traditional uprights and crossbars, and the interstice between the structural frame and the counterframe of each openable glass unit (3) being limited to the space which is strictly necessary for the development of the ledges (17) and the strikers (17a), with at least one gasket (17b) interplaced for the sealed closure of the opening glass unit (3), the said ledges (17) being realised on the fixed uprights (11a) and the fixed crossbars (13a) of the counterframe and the said strikers (17a) on the mobile uprights (11b) and the mobile crossbars (13b) of the structural frame.
 3. A facade as in claim 1, characterised by the fact that the uprights (11) are all divisible along their entire length, being subdivided in the zones not occupied by the spaces (5) which house the glass units (3), by a fixed upright (11a) and a second tubular fixed upright (11c) which tubular upright (11c) is solidly constrainable to the first and specially strengthened by means of wall-thickening and by means of partition of its principal body into at least two tubular parts (14, 14a), one of which coincides with the conduit (14), each upright (11), in the interruptions relative to the joint zones (30) for thermal expansion, envisaging joint sleeves (31, 32, 33), respectively along the tubular fixed upright (11c) and along the tubular parts (14a, 14), the sleeve (33) relative to the conduit (14) being conformed with at least its superior edges (33a) inclined, in order to facilitate the draining of the water.
 4. A facade as in claim 1, characterised by the fact of comprising drainage accessories (18) of the horizontal channel (15), sealedly arranged at the extreme sides of the said horizontal channel (15) and equipped with a short inclined conduit (18a) inserted directly internally to the vertical conduit (14).
 5. A facade as in claim 2, characterised by the fact that the mobile uprights (11b) and the mobile crossbars (13b) of each structural frame further comprise: a tubular body (19) for containing, on one upright, closing elements having a handle (20) externally applied; an external longitudinal housing (21) with the function of creating a constraint for a part of an articulation hinge (22) constrained, on the other side, to the counter frame and thus comprised in the interstice between the structural frame and counterframe; a frontal shaped zone (23) to support, with structural silicone (24), the inwardly-opening glass unit (3).
 6. A facade as in claim 2, characterised by the fact that the fixed crossbars (13a) comprise a tubular strengthening body (25); a frontal shaped zone (26) to meet and support a structural frame (27) of fixed glass units (3a); a longitudinal tab (28) defining, with the opposite and spaced wall of the said ledges (17), the horizontal channel (15).
 7. A facade as in claim 2, characterised by the fact that the fixed uprights (11a) also comprise: a frontal shaped zone (29) in order to meet and support a structural frame (27) of fixed glass units, located on the opposite side of the striker (17a); at least one seating (34) for the constraining of a part of an articulation hinge (22), constrained at its opposite side to a mobile upright (11b).
 8. A facade as in claim 3, characterised by the fact that the two fixed uprights (11a) and (11c) further comprise: a respective frontal shaped zones (29) and (29a) to meet and support a corresponding structural frame (27) of fixed glass units (3a); a respective reciprocal-coupling wall (36) and (35), also extending at the said frontal shaped zones (29) and (29a).
 9. A facade as in claim 3, characterised by the fact that at least the said sleeve (33) relative to the conduit (14) has an external peripheral annular throat (33b) lying on a plane coincidental to that of the interruptions relative to the joint zones (30) and having a greater breadth than the said interruption in the uprights (11),

so that a positioning fixing seal (33c) of the sleeve (33) can be received in the interstice between the bottom of the external peripheral annular throat (33b) and the upright (11) wall.

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- 10.** A facade as in claim 5, characterised by the fact that the said mobile uprights (11b) and the said mobile crossbars (13b) comprise a posterior tab (37) to hide the ledges (17), the strikers (17a) and the articulation hinges (22) from view from the inside.

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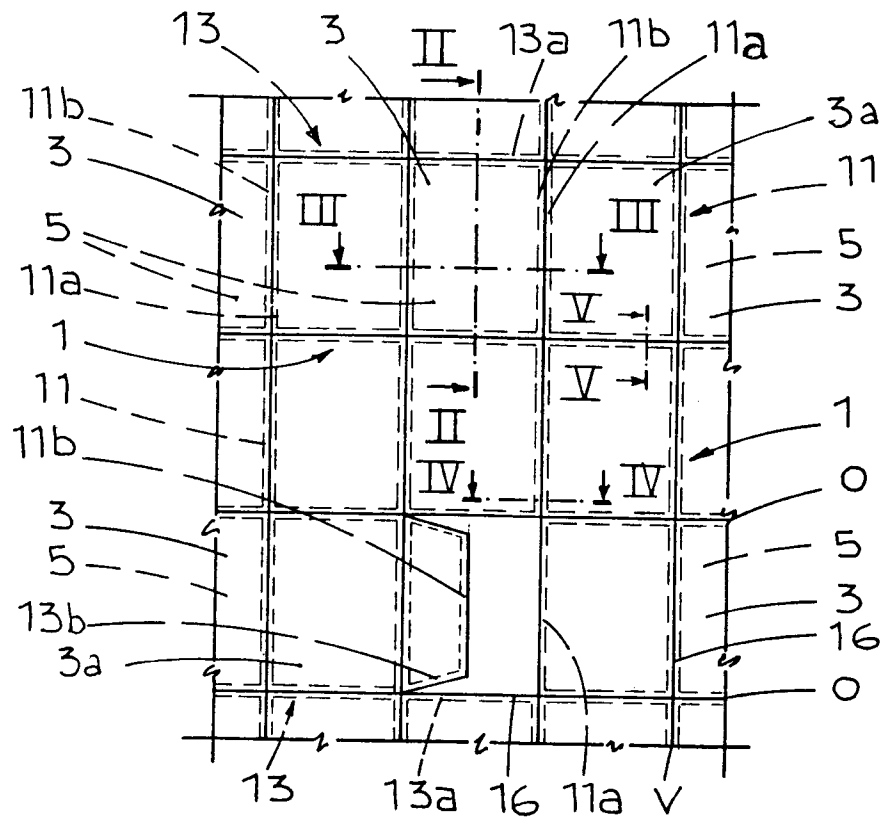


FIG 1

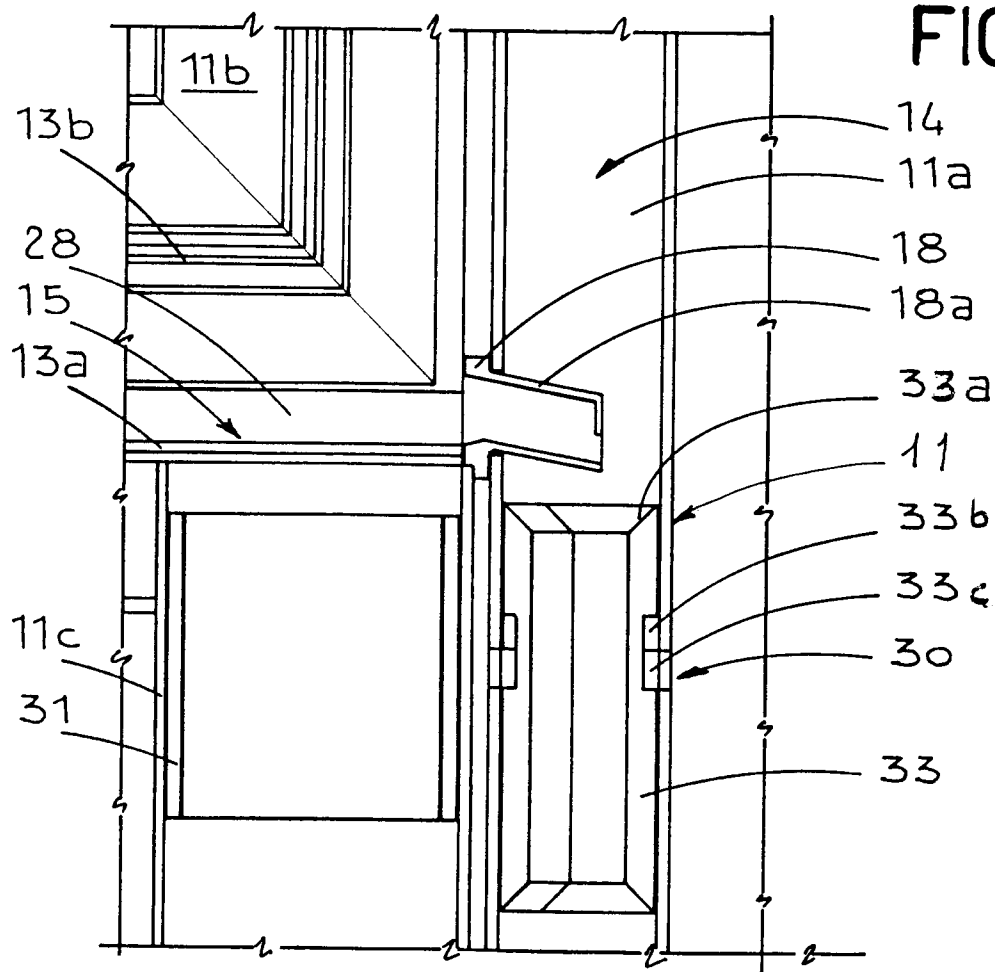


FIG 6

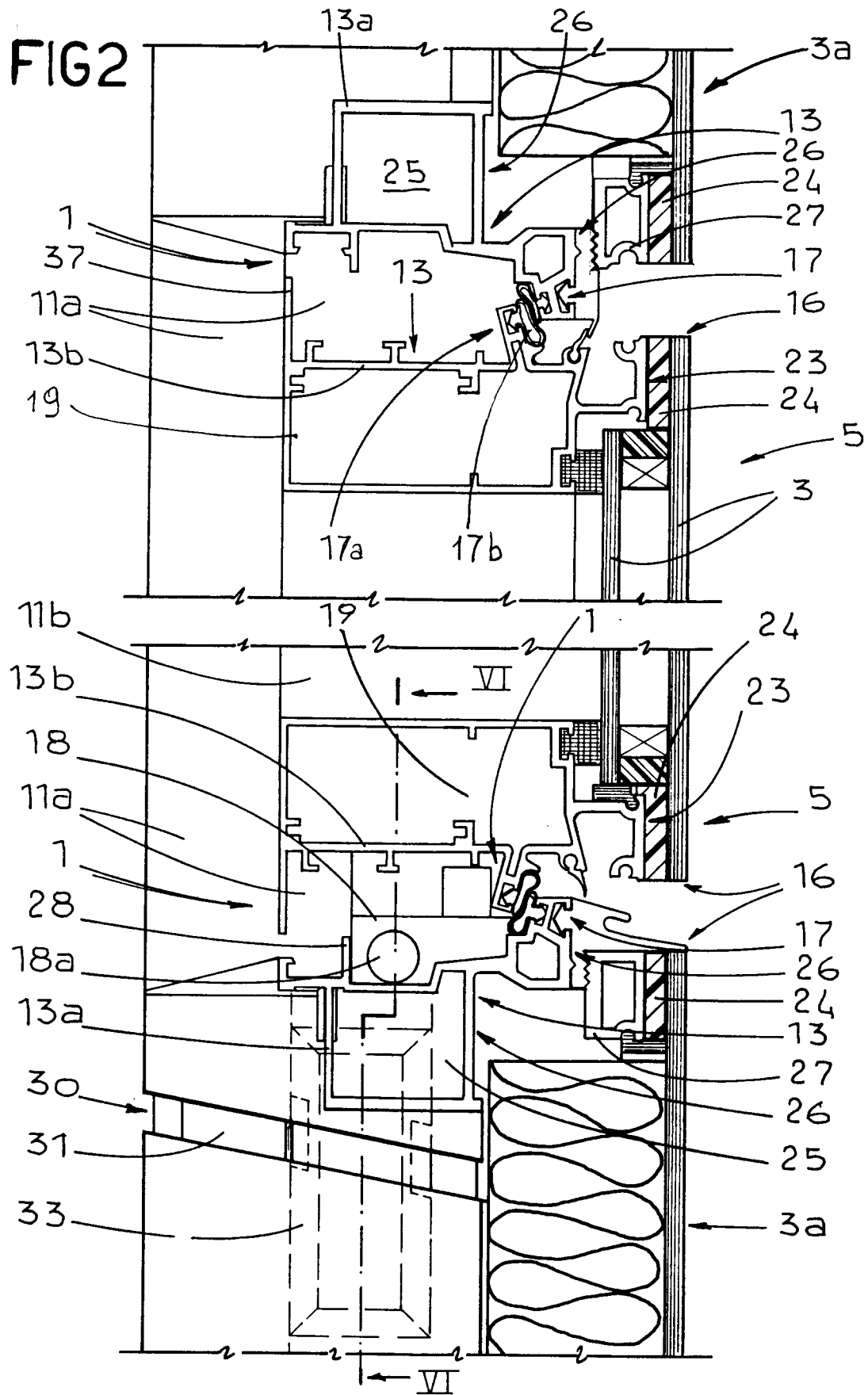


FIG 3

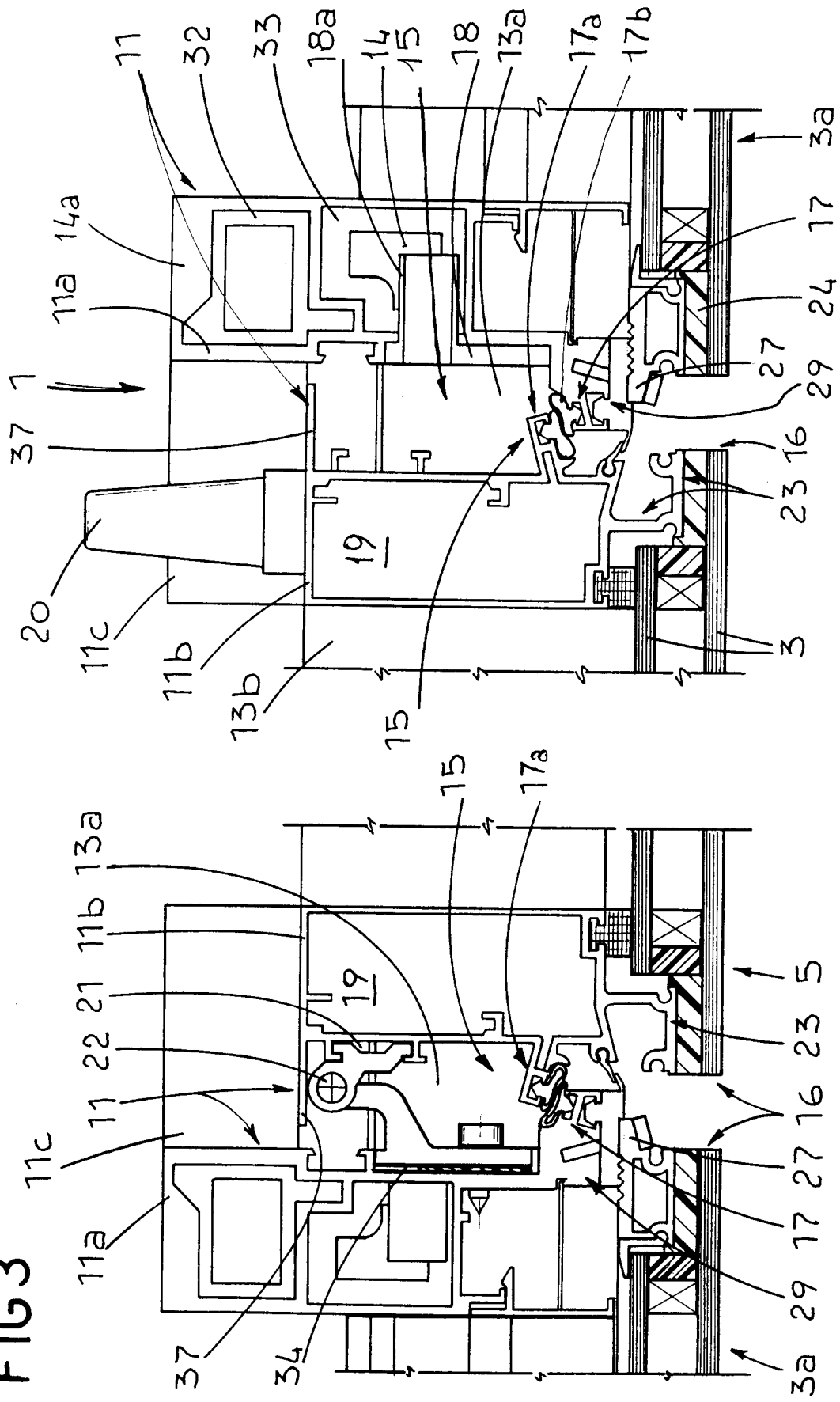


FIG 4

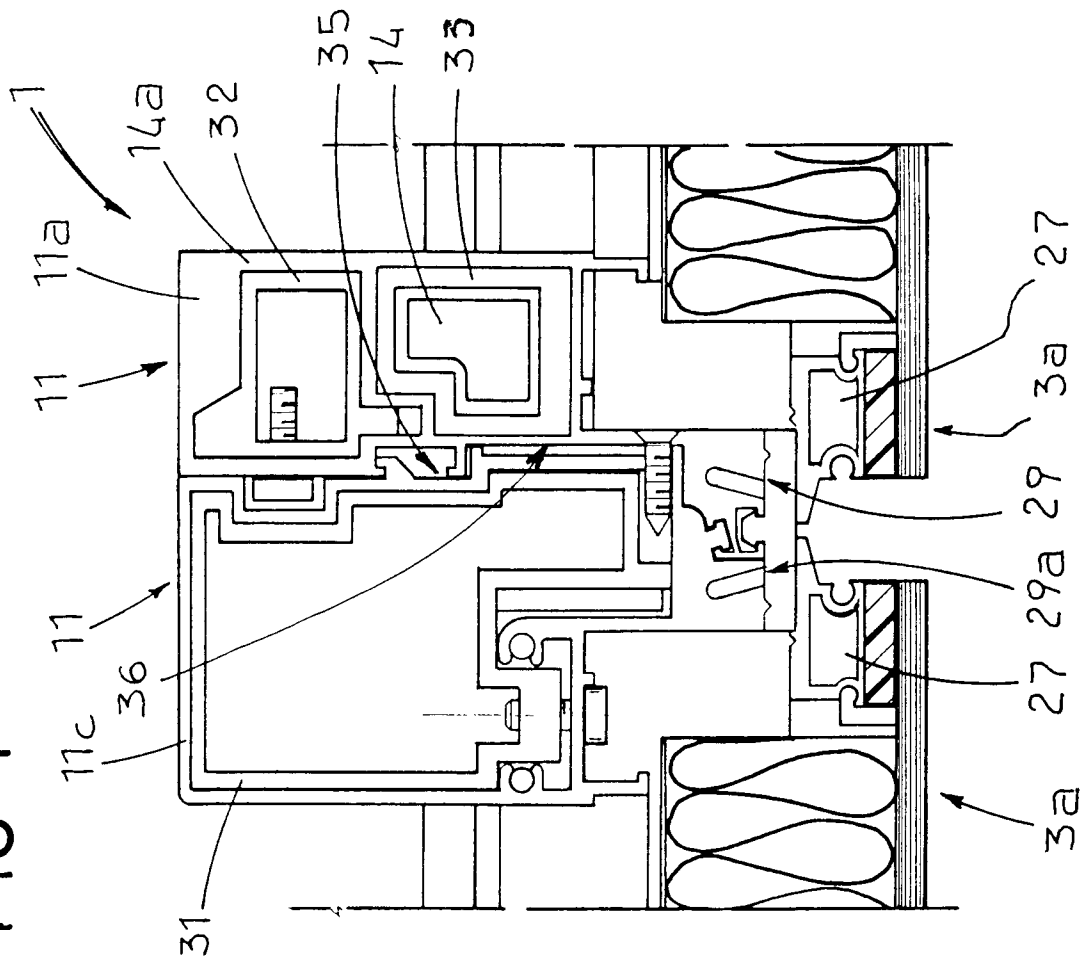
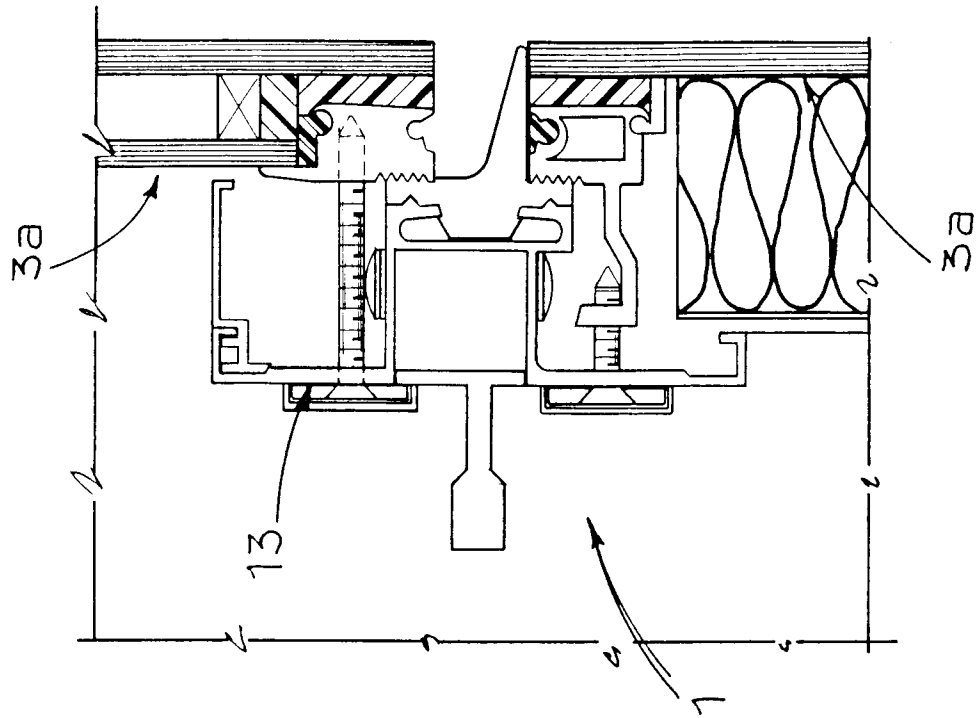


FIG 5





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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0353

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	GB-A-2 116 239 (YOSHIDA) * page 1, line 64 - page 4, line 25; figures 1-3 * ---	1,2	E06B3/54 E06B7/14 E04B2/96
A	US-A-3 961 452 (HUBBARD ET AL.) * column 3, line 6 - column 5, line 9; figures 1-3,6-8 * ---	1,4	
A	FR-A-2 619 587 (FELIX) * page 4, line 26 - page 6, line 3; figures 1,4,5 * ---	1	
A	US-A-5 086 596 (SCHLYPER ET AL.) * column 3, line 50 - column 4, line 6; figures 1-5 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E06B E04B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 MARCH 1993	Examiner BARBAS A.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			