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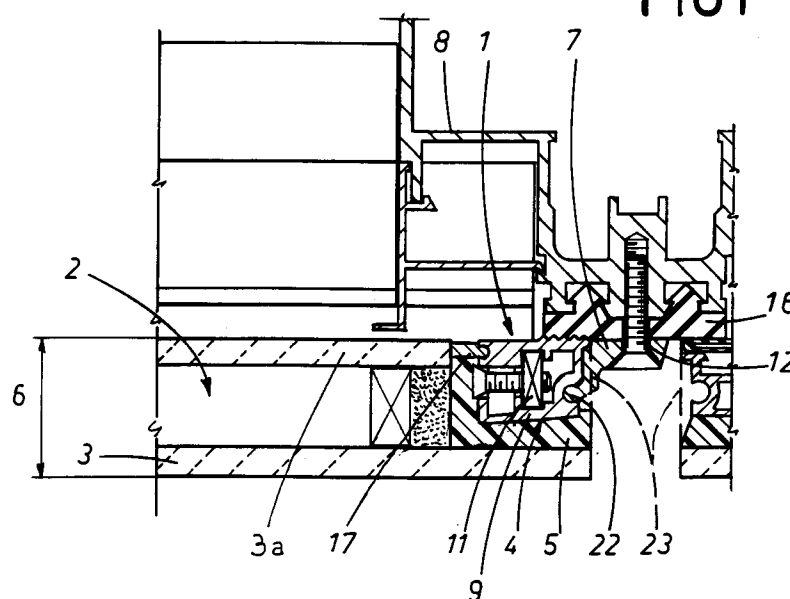
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I-47037 Rimini (Forlì) (IT)**(54) **A small-mass structural frame for double-glazing assemblies.**

(57) The invention relates to a small-mass structural frame for double-glazing assemblies of the type with external (3) pane of glass which project peripherally with respect to the internal (3a) pane of glass, in which the structural frame (1) is of the type supported by a bearing lattice (8) and envisaging structural silicone (5) for the support of the double-glazing assembly (2), said structural frame (1) being of a

size which is contained between the internal surface of the external pane (3) and the bearing lattice (8) and between the external edges of the internal pane (3a) and the external edges of the external pane (3) and being associable to the bearing lattice (8) frontally from the outside by means of constraining anchors (7).

**FIG1****EP 0 528 770 A1**

The invention relates to a small-mass structural frame for double-glazing assemblies of the type having their external glass pane peripherally projecting with respect to their internal glass pane, the frame being of the type which envisages, at its face which is united with the external glass pane, structural silicone support for the double-glazing assemblies.

Prior art structural frames for the support of double-glazing assemblies of the type with external pane peripherally projecting with respect to the internal pane, exceed the breadth of the double-glazing assemblies themselves, since they are of a shape which, when seen in section, substantially envisages two opposite appendices, wherein the constraining of the glass is done using the internal face of the external pane and the bearing lattice respectively.

The realisation of such a structure derives from the need to support the frame itself on the bearing lattice, which is internal to the facade.

This generally occasions three drawbacks: a first is represented by the fact that in order to realise frames of this type large amounts of materials are necessary; the second drawback is that it is difficult to insulate thermally the inside from the outside, since parts of the frame project towards the inside and therefore function as thermal conductors; the third drawback is that the said projecting parts of the frame are decidedly unaesthetic.

Further, the kind of fixing necessary for these frames requires more than one person operating contemporaneously both inside and outside the double-glazing assembly.

The aim of the present invention is thus to eliminate the above-mentioned drawbacks. The invention, as it is characterised in the claims which follow, solves the problem of limiting the material to the minimum possible, while maintaining the safety characteristics of the prior art solutions.

One of the advantages obtained through the present invention consists essentially in the fact that, apart from the considerable saving in materials, thermal insulation is easily achieved. Further, the frame object of this invention can be fixed by a single person working outside the double-glazing assembly.

The invention is described in more detail hereinafter with the help of the drawings which represent a preferred embodiment, illustrated here purely in the form of a non-limiting example, in which:

- Figure 1 shows an enlarged particular of the invention in longitudinal section;
- Figure 2 shows an enlarged particular of a transversal section of the invention;
- Figure 3 shows a frontal view of the invention, from which the sections of figures 1 and 2

have been taken.

With reference to the drawings, figure 1 shows that the invention substantially consists of a small-mass structural frame for double-glazing assemblies of the type with external panes 3 which peripherally project with respect to the internal panes 3a. The bearing frame 1 is of the type having, at its face 4 which is united with the external pane 3, structural silicone 5 for the support of the double-glazing assembly 2.

Both in figure 1 and in figure 2 it can be seen that the frame 1 is of a size which enables it to be contained breadthwise between the internal surface of the external panes 3 and an internal bearing lattice 8 and transversally between the external edge of the internal pane 3a and the external edge of the external pane 3. The frame 1 is constrainable to the bearing lattice 8 by means of constraining anchors 7 situated on its uprights 9 or, alternatively, on its cross-bars 10.

The constraining anchor's 7 can be situated only on the uprights 9 or on the cross-bars 10 since small angled supporting plates 11 are envisaged between the said uprights 9 and cross-bars 10. To confirm this need only for constraining anchors 7 on the uprights 9 or the cross-bars 10, it can be seen in the embodiment represented in the drawings that the constraining anchors 7 are applied to the uprights 9, as in figure 1, while in figure 2, where a cross-bar 10 of the structural frame 1 is illustrated in section, they are absent.

In this way the uprights 9 and the cross-bars 10 of the frame 1 are forced between the internal face 15 of the external panes 3 of the double-glazing assembly 2 and a gasket 16 positioned at the head of the bearing lattice 8: the structural frame 1 is thus extremely stable and safe thanks to the constraining anchors 7 and the angled supporting plates 11.

The constraining anchors 7 have coupling through-holes 12 to permit their frontal fixing to the bearing lattice 8 from the outside. The structural frame 1, laterally and peripherally, can have longitudinal channels 22 to receive movably the constraining anchors 7, which are slidingly positioned along the sides of the structural frame 1. In order to effect the fixing operation of the constraining anchors 7 to the bearing lattice 8, differently from prior art teaching, only one worker is necessary and not two as before, who worked contemporaneously one inside and one outside the double-glazing assembly 2.

In both figures 1 and 2 connecting gaskets 17 can be seen which are compatible with the structural silicone 5, which gaskets' 17 presence enables the structural silicone 5 to work, as required by the norms, only on two opposite surfaces, which can be for example the face 4 of the frame 1

united with the external panes 3 and the internal face 15 of the same external panes 3.

In order to insulate thermally the structural frame 1 from the outside, its being contained between the external edges of the external panes 3 and internal panes 3a, weather strips 13 are envisaged which can easily cover or wholly border the edge 14 of the frame 1 exposed to the outside; the weather strips 13, on the sides of the structural frame 1 which are not equipped with constraining anchors 7, can project from the gasket 16 positioned at the head of the bearing lattice 8, on which the posterior side of the same structural frame 1 leans, which remains perfectly insulated. Instead, on the sides equipped with constraining anchors 7, preferably the structural silicone 5 can have a tongue 23 turned towards the bearing lattice 8, with an identical insulating function.

As can be seen in figures 2 and 3, this type of structural frame 1 is perfectly suited for use in sandwich panels 18 having a considerably larger breadth and with insulating material 19 interpositioned between an external reflecting face 20 and an internal bottom 21 in sheet metal, generally used for thermo-acoustic insulation.

## Claims

1. A small-mass structural frame for double-glazing assemblies, of the type having an external glass pane (3) which peripherally project with respect to an internal glass pane (3a), said structural frame (1) being of the type supported by a internal bearing lattice (8) and of the type which envisages structural silicone (5) for the support of the double-glazing assembly (2), characterised by the fact of being positioned and essentially comprised between the internal surface of the external pane (3) and the bearing lattice (8) and transversally between the external edges of the internal pane (3a) and the external edges of the external pane (3), in such a way as to constitute an edge (14) of the structural frame (1) easily coverable with weather strips (13), said structural frame (1) having, outside of the said frame (1) mass and only along the uprights (9) or the cross-bars (10) alternatively, constraining anchors (7) for constraining the frame (1) frontally to the bearing lattice (8) from the outside.
2. A frame as in claim 1, characterised by the fact that the said structural silicone (5) exhibits tongues (23) turned in the direction of the said bearing lattice (8), which tongues (23) function as an insulating gasket, said structural frame (1) leaning posteriorly on a gasket (16), at the

head of the bearing lattice (8), in such a way as to isolate it thermally.

3. A frame as in claim 1, characterised by the fact that, on the sides of the structural frame (1) where the said constraining anchors (7) are situated, tongues (23) projecting from the structural silicone (5) function as an insulating gasket and are directed towards the bearing lattice (8), weather strips (13) being envisaged on the adjacent sides of the structural frame (1), which weather strips (13) project from a gasket (16) at the head of the bearing lattice (8), the frame (1) posterior side leaning on the said gasket (16), in such a way as to isolate it thermally.
4. A frame as in claims 1 or 3, characterised by the fact of having, laterally and peripherally, longitudinal channels (22), each receiving one or more of the said constraining anchors (7).

FIG3

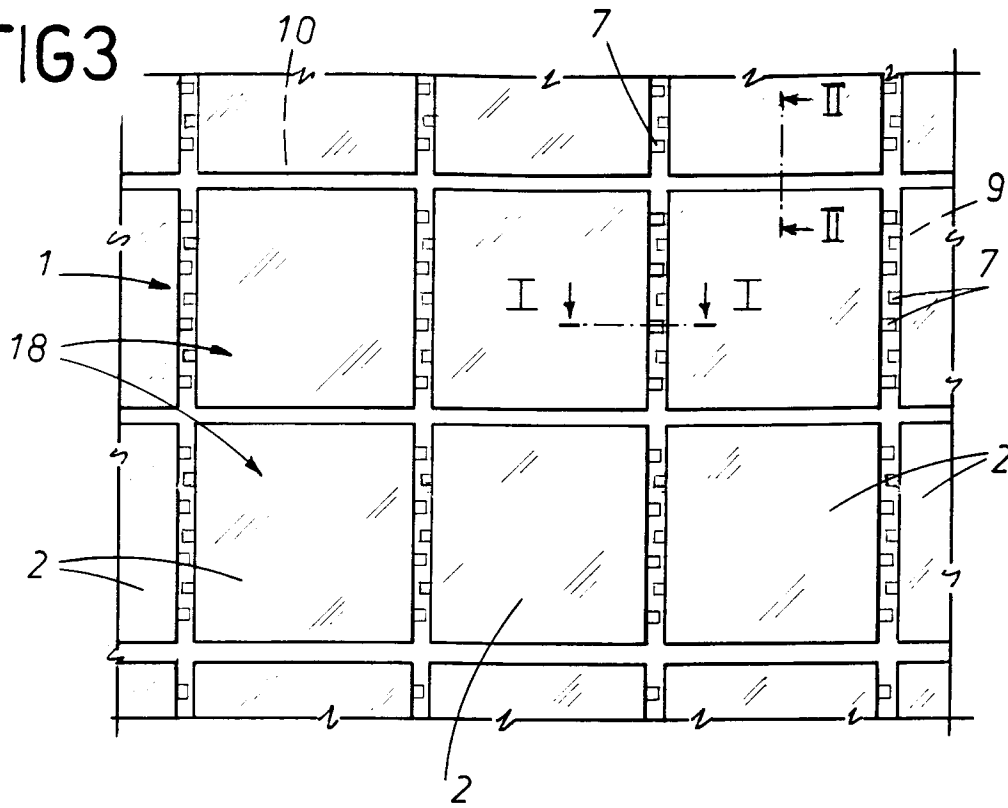


FIG1

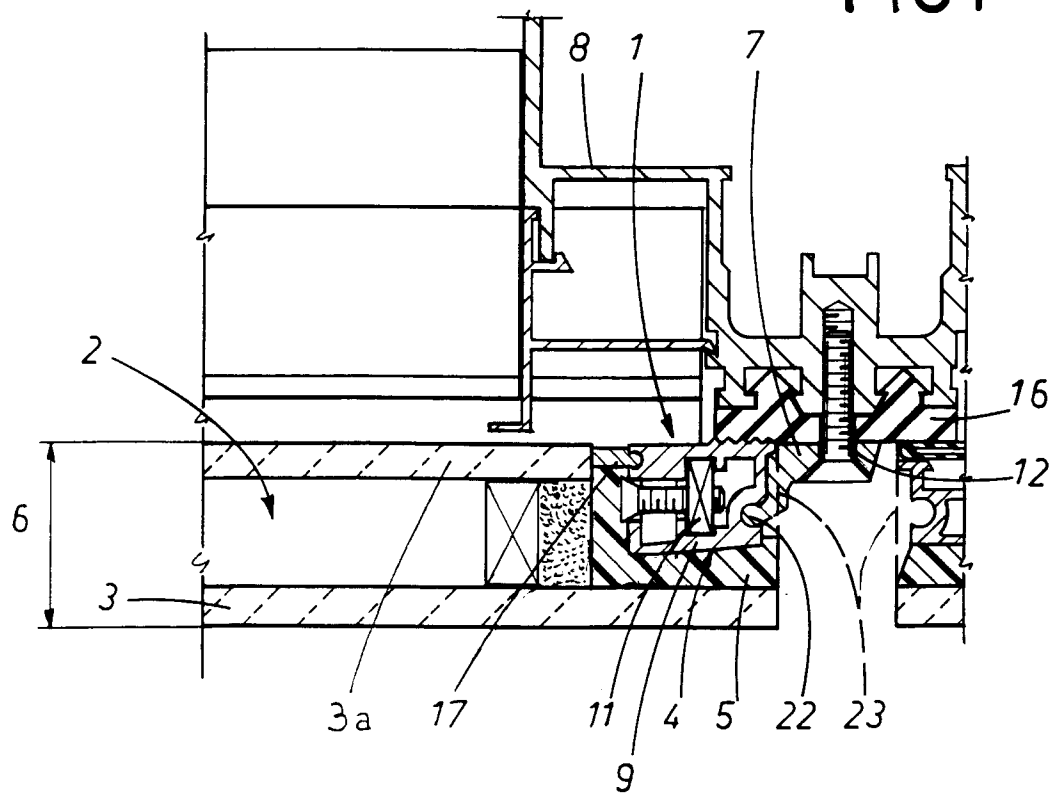
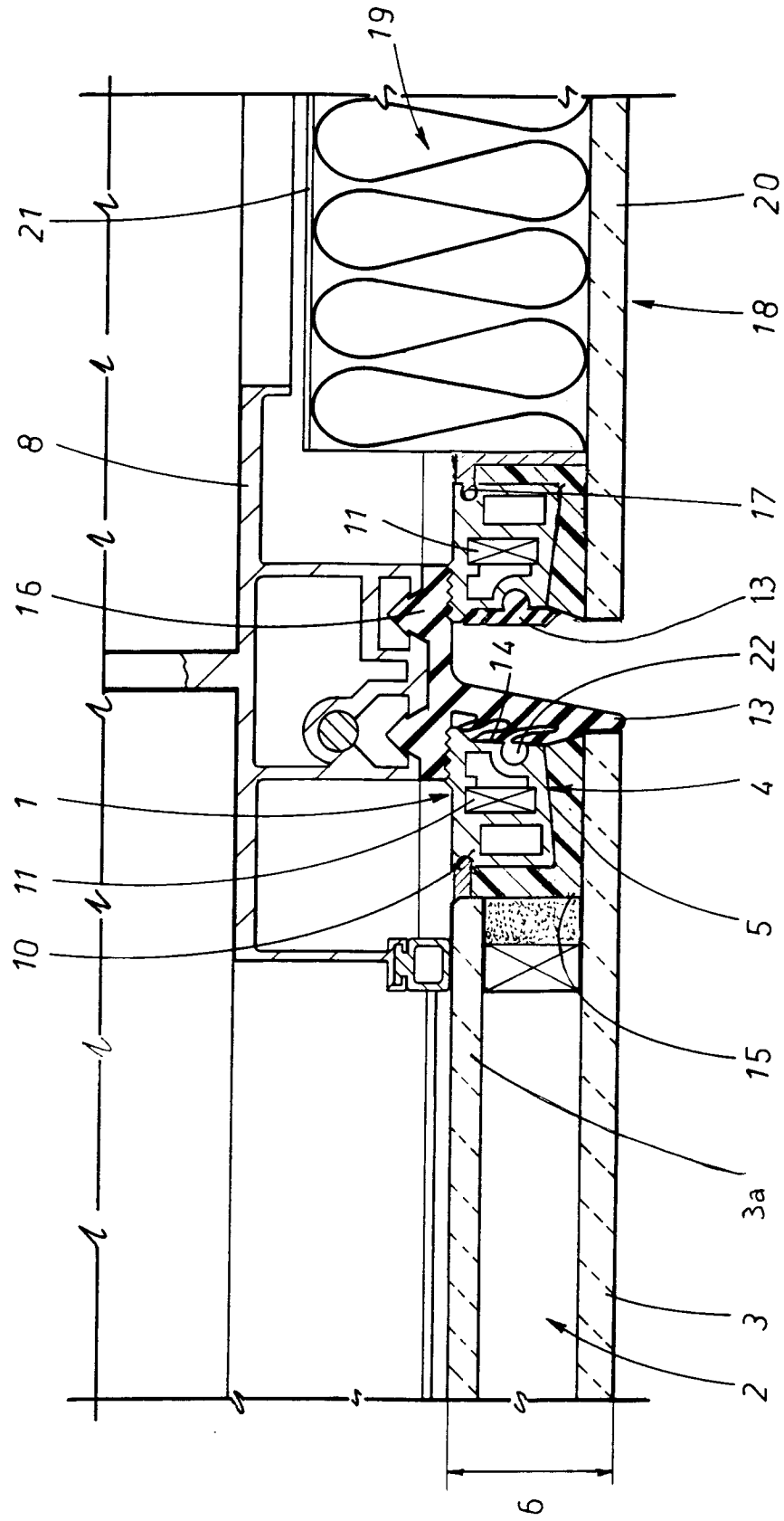


FIG 2





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# EUROPEAN SEARCH REPORT

Application Number

EP 92830372.6

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)
X	US - A - 4 552 790 (FRANCIS) * Fig. 19; column 11, line 36 - column 12, line 3 *	1, 2, 3, 4	E 06 B 3/64
A	GB - A - 2 190 696 (GARTNER & CO) * Fig. 1; page 1, lines 32-34, 89-112 *	1, 2	
A	DE - A - 3 439 436 (SCHÜCO) * Fig. 1; page 7, line 26 - page 8, line 34 *	1	
A	US - A - 4 803 817 (WHITE) * Fig. 6; column 2, line 68 - column 3, line 24 *	1	
A	DE - A - 3 714 629 (HENKENJOHANN) * Fig. 1; column 3, line 47 - column 5, line 7 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	CH - A - 673 863 (THERMOPANE AG) * Totality *	1	E 06 B 3/00 E 04 B 2/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 05-10-1992	Examiner KRUMPSCHMID
<b>CATEGORY OF CITED DOCUMENTS</b> 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			