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(54) **Continuous facing framework for buildings.**

(57) A facing framework (1) is composed of one or more panels (3) perimetrically provided with a groove (9) at which one or more coupling elements (10) are stably associable by interposing a sealing and protection element (12). The coupling elements (10) are rotatably or stably selectively associable with interconnection means (16) for fixing the facing framework to a supporting framework (2) from the inside of the building. Covering elements (24) are removably associable with said interconnection means, and weatherproofing means (14) are advantageously provided.

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CONTINUOUS FACING FRAMEWORK FOR BUILDINGS

The present invention relates to a continuous facing framework for buildings.

The term continuous facing framework currently describes a system having no vertical discontinuities, arranged externally to the supporting structure of the building.

Such continuous facing frameworks are usually constituted by a grid of metallic elements in which glass panes or panels of opaque material are inserted.

Among the known types of continuous facing framework there is a facing framework in which the grid is made of extruded profiled elements frontwardly provided with a shape suitable to accommodate curtain-wall panels in various materials.

The supporting structure is constituted by a planar grid formed by uprights fixed to the building slabs by means of adapted adjustable L-shaped elements and by crosspieces connected to the uprights by means of a rapid fixed-joint coupling.

The profiled elements are finished off with a covering element which naturally protrudes with respect to the plane of arrangement of the panel.

The facing frameworks thus obtained therefore have these covering elements at the perimetrical edges of the panels; since said covering elements protrude from said panels, they aesthetically alter the continuity of the facade and furthermore complicate its maintenance, as the panel and the covering element must be cleaned with greater care.

Facing frameworks are also known which comprise a grid constituted by a profiled element which perimetrically supports the glass pane.

In this case, too, the disadvantage observed is due to the fact that said profiled element is visible from the outside, constituting an element which is partially visible from the outside as it perimetrically embraces the pane, thus eliminating the characteristics of pleasant aesthetics required of building facing frameworks.

As a partial solution to these disadvantages, facing frameworks are known wherein the glass paneling is not interrupted by any kind of external profiled element but is fixed by thin supporting slabs by means of structural sealant.

Continuous facing frameworks thus obtained may be essentially divided into three types.

A first type of facing framework, termed supported, comprises a mechanical support on the inner pane of the glass-box both at the uprights and at the crosspieces of the grid.

However, in this case, too, structural silicone is used along the entire perimeter of the glass-box and of the mechanical support in order to support said glass-box.

A second type of facing framework requires the application of structural sealant on the outside of the supporting grid; the glass panel is associated on said sealant.

A third type of continuous facing framework, termed ventilated or triple facing framework, entails the sealing of a monolithic pane outside the grid by means of structural sealant; the glass-box is applied on the inside with conventional methods.

All these known types of continuous facing frameworks employing structural silicone have disadvantages: due to the considerable weight of the panels or monolithic panes, the structural sealant must give adequate assurances of durability and of weatherproofness to prevent said panels or panes from detaching from the grid with obvious consequent danger.

The basic problem of the method used in said known types of continuous facing frameworks resides in correctly applying the structural sealant; this requires a preliminary checking of its chemical compatibility with the glass, the coating layers, the gaskets, the metallic structure and the sealants used in the glass-box.

Continuous quality control is furthermore extremely important.

A highly sophisticated manufacturing method and control are therefore necessary, and this increases the time required to produce said facing frameworks and considerably increases their cost.

Another disadvantage observable in said known types of continuous facing frameworks employing structural silicone resides in the fact that in evaluating safety coefficients and loads one must take into account the negative pressures occurring on the panels or monolithic panes more than the pressures exerted thereon, i.e. the effects of wind, in buildings with glass-plated modular continuous facing frameworks.

Besides all these disadvantages in design and construction, a further disadvantage is also observed when the panel is to be replaced: if a plurality of panels is combined to constitute a module, replacement becomes very onerous if one of said panels is chipped or broken, as the entire module must be replaced.

The aim of the present invention is therefore to eliminate the disadvantages described above in known types by providing a continuous facing framework which has no vertical discontinuities, the panel being securely locked.

Within the scope of the above described aim, an important object is to provide a facing framework which is structurally simple as well as easy and rapid to assemble.

A further important object is to provide a facing framework which associates with the preceding characteristics that of allowing its installation from the inside of the building.

A further object is to provide a facing framework which associates with the preceding characteristics that of allowing its assembly at the building yard without requiring particular machines or controlled environmental conditions.

A further important object is to provide a facing framework which can be assembled and immediately applied to the building.

Still another object is to provide a facing framework wherein each individual component module can be rapidly and easily replaced from the inside of the building, the individual modules being therefore rapidly interchangeable.

Not least object is to provide a continuous facing framework which has very low production and installation costs.

This aim, the objects mentioned and others which will become apparent hereinafter are achieved by a continuous facing framework for buildings comprising a supporting framework, characterized in that it comprises at least one panel having at least one perimetrical groove at which at least one coupling element is stably associable by interposing a sealing and protection element, said at least one coupling element being selectively associable with interconnection means for fixing said facing framework to said supporting framework from the inside of said building.

Covering elements are advantageously removably associable with said interconnection means.

Weatherproofing means are conveniently provided.

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

figure 1 is a partially sectional plan view of the components of the facing framework at the region of coupling to the supporting framework;

figure 2 is a view, similar to the preceding one, of a variated embodiment related to a coupling element selectively associable with interconnection means for fixing it to the supporting framework;

figure 3 is a view, similar to the previous ones, of a further embodiment illustrating the corner profiled element;

figure 4 is a view, similar to the preceding ones, of still a further embodiment.

With reference to the above-described figures, the reference numeral 1 indicates a continuous facing framework and the reference numeral 2 indicates a supporting framework rigidly coupled to

the building:

The facing framework is composed of one or more panels 3 which are of the glass-box type in this particular embodiment.

Said panels 3 are in fact constituted by an actual glass-box 4, a first slightly smaller glass pane 6 being superimposed on one of the surfaces of said glass-box 4 by interposing a first layer of adhesive 5.

Said first layer of adhesive affects the entire surface of the first glass pane 6 associated with the glass-box 4.

A second glass pane 7 is similarly associated on the opposite side with respect to said first glass pane 6 and a second layer of adhesive 8 is interposed therebetween.

Said second glass pane 7 is larger than said first pane 6 and said glass-box 4.

The dimensions of said glass-box 4, of said first glass pane 6 and of said second glass pane 7 are such as to define a perimetric groove 9 between said glass-box 4 and said second glass pane 7.

Said groove constitutes an engagement seat for one or more coupling elements constituted by a first small frame 10 having a first wing 11 arrangeable within said perimetric groove 9 by interposing a sealing and protection element constituted by a first gasket 12.

Said first gasket 12 surrounds said first wing 11 and continues so as to interpose itself between the first small frame 10 and the perimetric edge of the glass-box 4.

Said first small frame 10 advantageously has a second wing 13, opposite to the first wing 11, the end whereof is arranged flush with respect to the perimetrical edge of the second pane 7; a weatherproofing means, constituted by a third layer 14 for example in silicone-based material, can be interposed between said wings.

On the opposite side with respect to said first and second wings, said first small frame 10 has a first seat 15 for means for interconnecting with the supporting framework 2 constituted by a dowel 16.

Said dowel has a head 17 rotatably associated within said first seat 15 by interposing a second gasket 18 and directed towards the adjacent panel.

A first stem and a second stem, respectively 19 and 20, extend from said head 17 approximately perpendicular to said panel 3 and can be accommodated within adapted complementarily shaped seats provided on said supporting framework 2.

Said means for interconnecting with the supporting framework 2 is conveniently fixed by means of an adapted screw 21 transversely affecting said second stem 20 and said supporting framework 2.

A pair of first protrusions 22 protrudes from the stem 20 on the opposite side with respect to said

supporting framework; said protrusions are elastically deformable and associable with adapted second protrusions 23 which protrude from covering elements constituted by plates 24.

Adapted seats for further sealing means, such as for example gaskets, are furthermore provided at the first small frame 10.

The particular configuration of the facing framework is such that the use of structural silicone can be avoided for its installation, also by virtue of the particular configuration of the panel 3, and a mechanical element, such as the first small frame 10, is used instead; the first wing 11 of said small frame 10 safely locks the panel without cutting into it by virtue of the first gasket 12.

Said first small frame 10 can naturally totally or partially affect the perimetrical groove 9 provided on the panel 3.

It is thus possible to produce the facing framework, for example at the building yard, by combining the first small frame 10 with the panel 3 in a rapid and per se simple manner, with the assurance that the securing therebetween is durable because it is mechanical.

The use of means for interconnecting the first small frame and the supporting framework, constituted by the dowel 16, furthermore allows to assemble the facing framework from the inside of the building, securing it to the supporting framework by using simple screws 21.

The number of dowels may naturally be any according to the specific requirements.

Naturally, if they affect only one longitudinal or transverse side of the first seat 15, for example the upper transverse side, the panel may be opened, as it can be rotated with its fulcrum at the head 17 of the dowel 16.

It has thus been observed that the invention achieves the intended aim and objects, a facing framework having been provided which has no vertical discontinuities as there are no elements protruding beyond the surface of the panel; said panel is locked in conditions of maximum safety to the supporting framework of the building.

The particular structure of the facing framework furthermore allows to assemble it simply and easily and to install it from the inside of the building.

The assembly of the structure furthermore requires no particular equipment, as it can be achieved for example at the building yard.

The structure of the facing framework furthermore allows to rapidly and simply replace every individual module constituted by a panel, a first small frame and dowels.

The invention thus conceived is naturally susceptible to numerous modifications and variations, all of which are within the scope of the same inventive concept.

Thus, for example, figure 2 illustrates a second embodiment of a facing framework 101 in which the first small frame 110 can again have a first wing 111 and a second wing 112, the first wing being arrangeable at a preset perimetrical groove 109, provided between the second glass pane 107 and the surface of the facing glass-box 104, by interposing a first gasket 112.

Said first small frame 110 can furthermore have an S-shaped configuration and have, on the opposite side with respect to said first and second wings, a second seat 125 for means adapted to allow the panel 103 to slide, for example, along one or more axes with respect to the supporting framework 102.

Figure 3, for example, illustrates a corner profiled element, each panel 203 having for example a first small frame, in the configurations illustrated in figure 1 or figure 2, arranged on the side opposite to the one arranged at an angle with respect to another panel.

A third gasket 227 is instead provided proximate to the corner 226, between, the perimetrical edges of the glass-boxes 204, and has a substantially triangular head in which two sides adhere to the lateral walls of the glass-boxes 204; a third stem 228 protrudes from one of its vertices and has a cylindrical lug 229 at its end.

A first small frame 210 is arranged proximate to the corner 226 on each panel and one of its ends has a seat for the dowel 216 while the other end has a third seat 230 at which structural silicone 231 is applied adherent to a surface of the glass-box.

In this case, too, no profiled element is visible perimetrically to the panel.

Figure 4 illustrates a facing framework 301 wherein the first small frame 310 has a first substantially cylindrical seat 315 on the opposite side with respect to the first wing 311; a complementarily shaped head 317 of a dowel 316 is arrangeable and slidable within said seat 315 and can be rigidly associated with the supporting framework 302 by means of an adapted screw 321.

The materials and dimensions of the individual components constituting the facing framework may naturally be the most pertinent according to the specific requirements.

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 scope of each element identified by way of example by such reference signs.

Claims

1. Continuous facing framework for buildings comprising a supporting framework, characterized in that it comprises at least one panel having at least one perimetrical groove at which at least one coupling element is stably associable by interposing a sealing and protection element, said at least one coupling element being selectively associable with interconnection means for fixing said facing framework to said supporting framework from the inside of said building.

2. Facing framework according to claim 1, characterized in that covering elements are removably associable with said interconnection means.

3. Facing framework according to claim 1, characterized in that it comprises weatherproofing means associated with a first small frame.

4. Facing framework according to claim 1, characterized in that said at least one panel is constituted by a monolithic element having at least one groove at its perimetrical edge, said at least one groove affecting said perimetrical edge at least partially.

5. Facing framework according to claim 1, characterized in that said at least one panel comprises a glass-box, a first slightly smaller pane being coupled to one of its surfaces by interposing a first layer of adhesive affecting said surface at least partially.

6. Facing framework according to claim 5, characterized in that a second pane, slightly larger than said first pane and of said glass-box, is coupled with said first pane on the opposite surface with respect to the surface coupled to said glass-box by interposing a second layer of adhesive affecting said surface at least partially.

7. Facing framework according to claim 6, characterized in that said panel comprises a single monolithic element constituted by a thin slab of construction and/or covering material coupled with insulation elements.

8. Facing framework according to claim 1, characterized in that said perimetrical groove is provided between said glass-box and said second pane.

9. Facing framework according to claim 1, characterized in that said perimetrical groove constitutes an engagement seat for at least one coupling element constituted by a first small frame having a first wing arrangeable at said perimetrical groove.

10. Facing framework according to claim 9, characterized in that a sealing and protection element, constituted by a first gasket embracing said first wing and/or the perimetrical edge of said glass-box, is arrangeable between said first wing and said perimetrical groove.

11. Facing framework according to claim 9, characterized in that said first small frame has a second wing, opposite to said first wing, the end whereof is arranged flush with respect to the perimetrical edge of said second pane, a weatherproofing means being interposable between said wings.

12. Facing framework according to claim 9, characterized in that said first small frame has, on the opposite side with respect to said first and second wings, a first seat for means for interconnection with said supporting framework.

13. Facing framework according to claim 4, characterized in that said first small frame has an S-shaped configuration, a second seat for means for opening said panel along separate axes being provided at the opposite end with respect to the end bearing said first and second wings.

14. Facing framework according to claim 1, characterized in that said interconnection means are constituted by a dowel the head whereof is rotatably associated at said first seat by interposing a second gasket, said head being directed towards the adjacent panel.

15. Facing framework according to claim 14, characterized in that at least one stem, accommodatable within complementarily shaped seats provided on said supporting framework, extend from said head approximately perpendicular to said panel.

16. Facing framework according to claim 15, characterized in that means for fixing said first small frame to said supporting framework are associable with said at least one stem, said means being constituted by screws.

17. Facing framework according to claim 14, characterized in that a pair of first protrusions extends from said at least one stem on the opposite side with respect to said supporting framework, said protrusions being elastically deformable and associable with adapted second protrusions extending from covering elements constituted by plates.

18. Facing framework according to claim 3, characterized in that said first small frame has at least one seat for further sealing means.

19. Facing framework according to claim 12, characterized in that said first seat has a semicircular plan configuration, a complementary shaped head of a dowel being slidably and removably arrangeable within said seat.

20. Facing framework according to claim 1, characterized in that a third triangular gasket is provided at a corner profiled element and has two sides interacting with the lateral walls of two panels arranged mutually perpendicular, said third gasket having a third stem protruding from a vertex and provided with a cylindrical lug at its end.

21. Facing framework according to claim 20,

characterized in that said first small frame has a
third seat for structural silicone proximate to said
corner profiled element.

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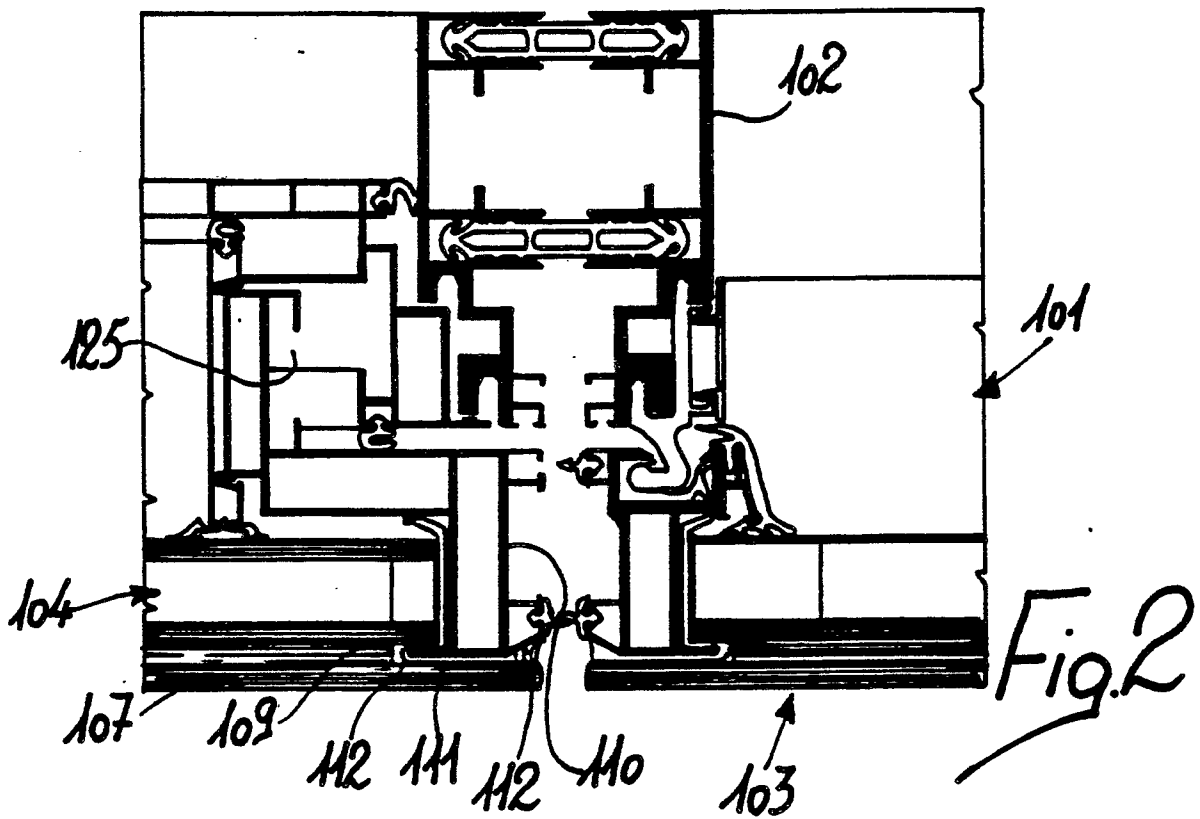
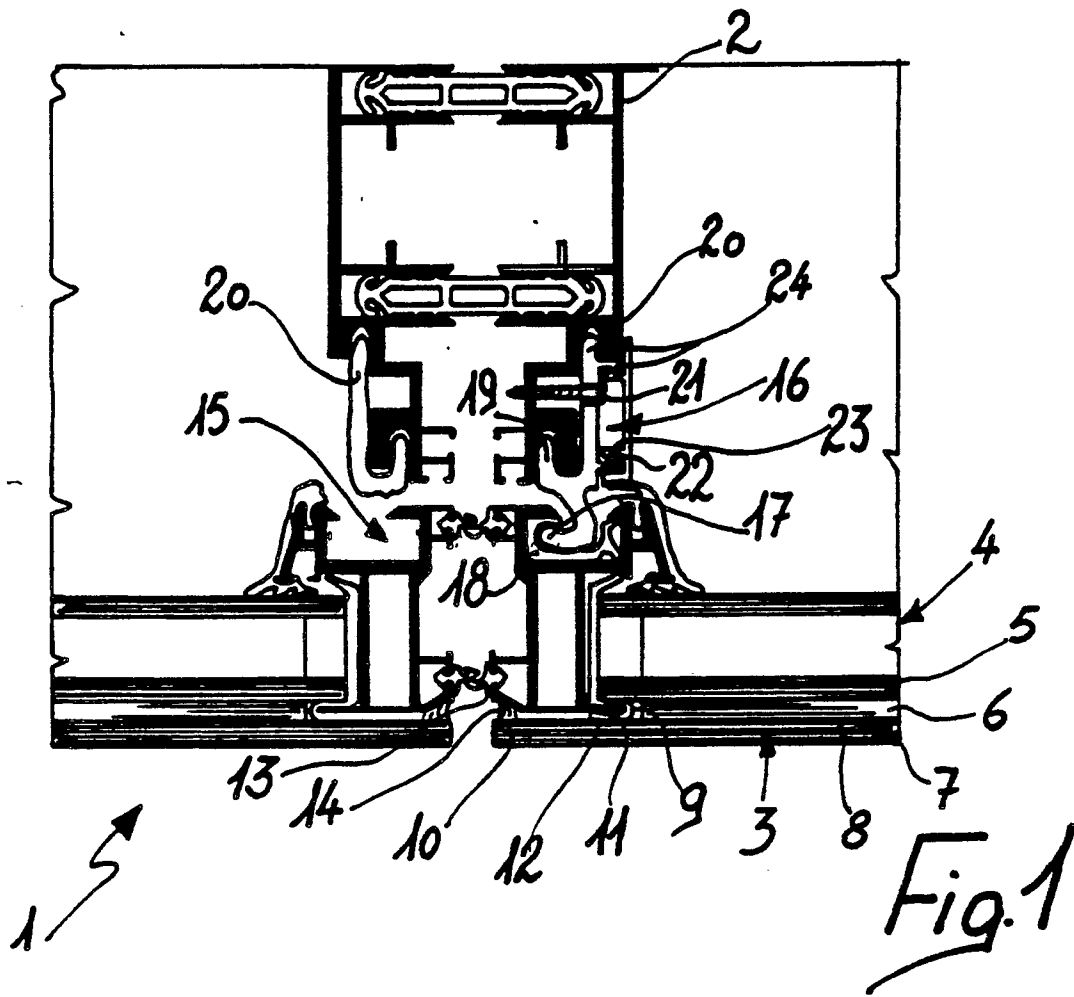
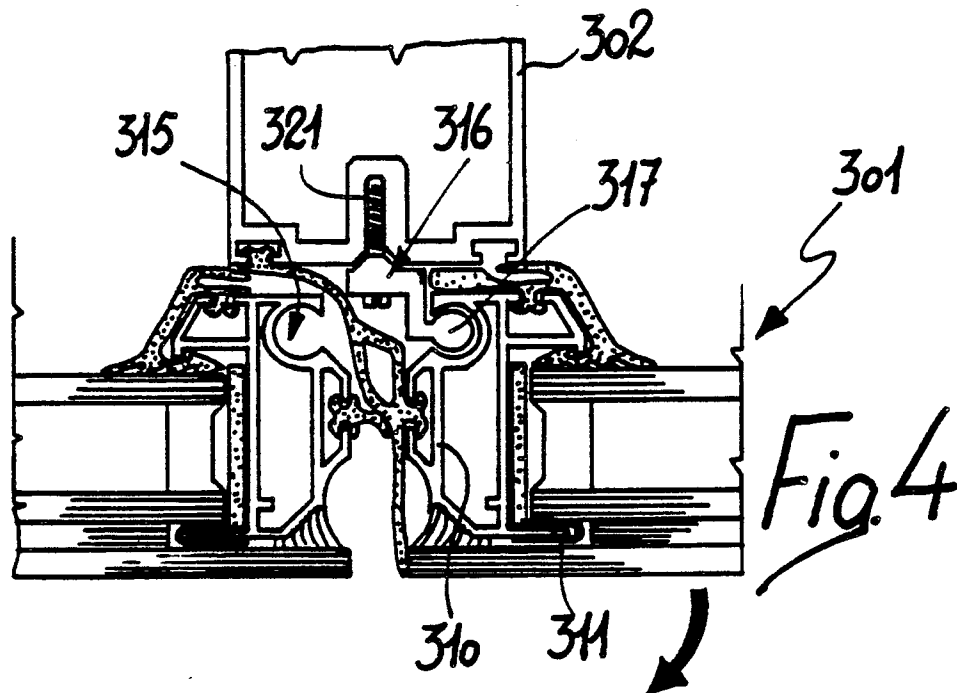
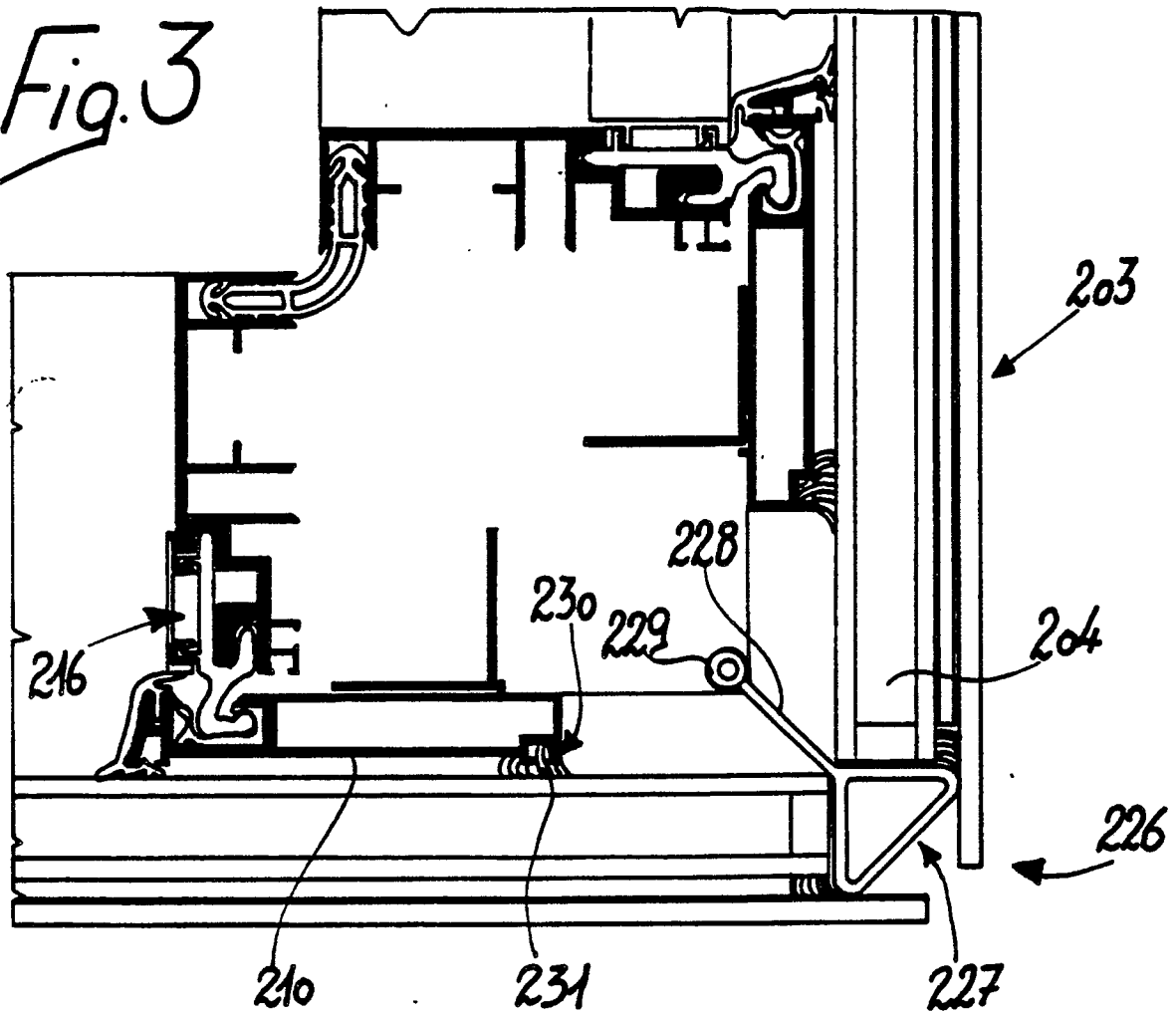


Fig. 3





European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 89 10 6291

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)
Y	DE-A-3 721 112 (ISOLAR-GLAS-BERATUNG GmbH) * Column 3, lines 41-68; column 4, lines 1-19; figures 1,3 *	1,3,5,6 ,8-10, 12,18	E 06 B 3/54 E 04 B 2/96
A	---	4,7,16, 19	
Y	GB-A-2 179 391 (C.C. DI COSTA & CIA) * Page 1, lines 48-85; figure 3 *	1,3,5,6 ,8-10, 12,18	
A	---	2,13,16 ,20,21	
A	EP-A-0 223 132 (ELTREVA AG) * Abstract; figures 1-3,6 *	11,14- 17	

	GB-A-2 155 981 (A.A. TIDY et al.) * Page 2, lines 70-128; figures 1,2 *		

			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E 06 B E 04 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11-12-1989	Examiner KAPPOS 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	