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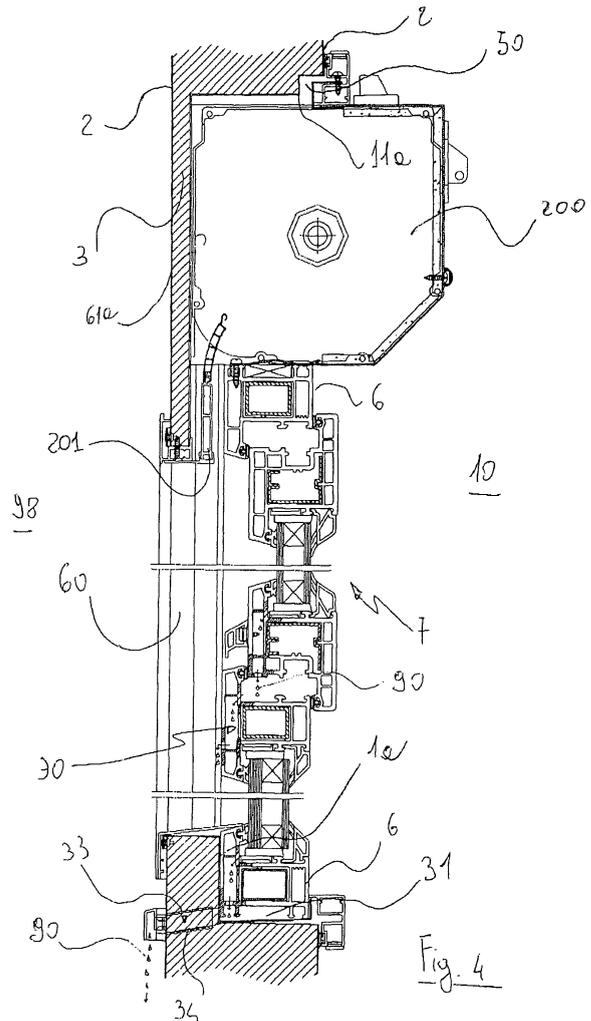
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(54) Prefabricated or composed wall for window or door

(57) Prefabricated or composite wall comprising one or more panels composed of at least two external layers and at least one filler material inserted between said two external layers, said wall furthermore comprising at least one opening, effectuated in, or defined by said one or more panels and at least a window or door casement having a fixation frame that can be anchored onto said at least one opening, said wall being characterised in that, on at least part of said opening, is a first perimetric recess to house, at least partially, said fixation frame of said window or door casement.



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Description

[0001] The present invention relates to a prefabricated or composite wall, conceived to contain at least one window or door casement. The wall in question is preferably an external wall. In other words, positioned on the outside perimeter of a building, and used for civil (non-industrial) structures such as schools, apartment buildings, warehouses and similar buildings, which contain casements of the type that are used for windows, doors and similar openings.

[0002] According to prior art, the prefabricated or composite walls of the aforesaid type comprise one or more panels, each of which having at least two external layers, generally constructed in metal to provide structural rigidity, and at least one filling material, positioned between the two external layers, conceived to thermally and/or acoustically insulate said panel. Furthermore each of said panels is fixed to other panels and configured in a manner to define an opening suitable to house a window or door casement, which is attached to the perimetric portion of the opening, by means of its specific frame. As stated previously, said wall can also be composed of a single panel, in which case the opening is effectuated directly in the wall panel itself.

[0003] However, in both cases, the connection between the wall and the window or door casement is performed in a manner so that the latter is positioned inside the opening and flush with the internal and external surfaces on both sides of the wall.

[0004] For example, patent EP1250508 describes a window or door casement having a U-shaped frame, able to be attached to the opening around its edges, in such a manner that the window or door casement is set substantially flush with the surfaces of both sides of the wall.

[0005] This solution presents the drawback that the acoustic and thermal insulation of the wall depends exclusively on the quality of the connection between the frame of the window or door casement and the wall. Therefore, in cases where points of discontinuity may occur in the connection between the window or door casement and the wall, the overall insulation provided by the wall is reduced to a large extent. In particular, one of the worst drawbacks is the problem of drafts that pass through the connection area between the frame of the window or door casement and the opening in the wall, which generally flow in a straight line, and which can reduce the overall thermal and acoustic insulation of the wall drastically.

[0006] Furthermore, the mechanical resistance of the connection between the wall and the window or door casement results as being rather limited. This is caused by the fact that the connection between the window or door casement and the wall is formed by a U-shaped frame, and normally in an overlapping position along the edges of the opening, thus maintaining the window or door casement in its fixed position. In addition to this aspect is the fact that the mechanical resistance of the wall

is worsened with the increase in the number of panels used to form the wall, a fact that is relatively common in the production of this type of wall.

[0007] The aim of the present invention therefore, is to provide a wall that is able to contain and support a window or door casement in a robust manner, while at the same time eliminating the drawbacks connected with thermal and acoustic insulation and to provide increased mechanical resistance in the finished wall.

[0008] These and other aims are achieved by the present prefabricated or composite wall, comprising one or more panels having at least two external layers and at least one filling material between said two external layers, said wall also comprising at least one opening effectuated in, or defined by, said one or more panels, and at least one window or door casement having a fixation frame able to be anchored in position in said at least one opening. Advantageously, positioned on at least one part of said opening, is at least one first perimetric recess conceived to house, at least partially, the said fixation frame of said window or door casement.

[0009] This solution provides a system to achieve the aims proposed, in particular, those inherent to the acoustic and thermal insulation of the wall.

[0010] In fact, connecting surfaces between said frame and the said first perimetric recess, which when seen in a transversal or longitudinal cross-section assume a stair or step form, define a path with a labyrinth-like configuration. In this manner, the air from the exterior is unable to reach the internal side of the wall because it is forced to flow along the labyrinth-like path, thus losing all energy well before it can reach the internal side of the wall.

[0011] Furthermore, the mechanical resistance of the wall is increased in relation to that of prefabricated walls according to prior art. In fact, unlike the system used in walls according to prior art, the frame of the window or door casement fixed to the wall is set to fit in the first perimetric recess, onto the opening in question. Basically, said first perimetric recess acts as a shoulder or abutment for the window or door casement, encasing it in and maintaining it strongly fixed to the wall.

[0012] According to a preferred embodiment of the invention, the first perimetric recess is positioned on the internal side of the wall, in other words, on the side that faces the interior of the structure and is visible from the inside of the building. This solution is therefore able to hide the frame of the window or door casement so that it is not visible to those outside the structure, thus improving the appearance of the perimetric wall of the prefabricated building, as well as increasing the range of possibilities for aesthetic choices available for the designer when creating the building project.

[0013] This also offers the advantage of considerably reducing the strong architectonic impact that prefabricated, or composite buildings, have on surrounding buildings, and even more so, if the window or door casement also includes a compartment for a roller shutter, or for a roller blind, because these too are visible from the exterior

of the building in prefabricated walls of prior art.

[0014] However in the solution described herein, it is possible to also hide the upper compartment for the roller shutter or blind when seen from the exterior, thus providing the possibility of constructing prefabricated buildings of any shape or form desired by the project designer, without excessively compromising the architectonic view in the area where the prefabricated building is erected.

[0015] Furthermore, the frame of said at least one window or door casement can also include means for fixing in a removable manner, said at least one window or door casement to said wall. Said fixing means comprise at least one bracket positioned between said frame and said first recess. In this manner, the window or door casement is fixed to a first point of the bracket, which in turn is fixed in a second point to the wall. To remove the window or door casement from the wall, the bracket can be simply detached from the wall at the second fixing point. Naturally the first fixing point and the second fixing point can be composed of a plurality of points which are arranged around the total perimeter of the opening. It should be noted that the detachment of the window or door casement from the wall is carried out without the need for removing the glass from the window or door casement in question, unlike window and door casements of prior art. This advantage contributes towards considerably reducing the time required for replacing a window or door casement. Furthermore, when the recess is practised on the internal side of the wall, window or door casement replacement is performed from the inside of the building, and therefore no external scaffolding is required in order to perform the aforesaid operations.

[0016] The wall comprises a second perimetric recess in proximity to the first perimetric recess, for inserting said removable fixing means. Basically, in a transversal or longitudinal cross-section of the wall, said connecting surfaces assume the form of a double stair or step, where the first step or first recess, houses the frame, while the second step or second recess, houses said removable fixing means.

[0017] Again, according to a preferred embodiment of the invention, the window or door casement can include means for the down flow and collection of any liquid that infiltrates between the internal surface of said one or more panels, and that of said window or door casement, or inside the window or door casement itself, between the glass and the frame, by passing through the seal. In this case the wall includes further means for evacuating said infiltration liquid from said collector means. Said means of evacuation comprise one or more discharge pipes encased transversally inside said wall and conceived to provide a connection means for fluids to flow between said liquid collector means and the exterior of the building.

[0018] Lastly, it should be stated that the prefabricated wall can be constructed by positioning two panels adjacent to one another and conforming them in a manner to define the aforesaid opening. Alternatively, the wall can

be composed of three or more panels, or even a single panel, and in which case the opening is cut directly in the panel itself.

[0019] A description of certain embodiments of the present invention will now be provided purely as a non-limiting example, with reference to the appended drawings, wherein:

- figure 1 shows a front view of the wall from its external side;
- figure 2 shows a front view of the wall from its internal side ;
- figure 3 shows a cross-section view A-A of the wall in figure 1;
- figure 4 shows a cross-section view D-D of the wall in figure 1;
- figure 5 shows a cross-section view D-D of the wall in figure 1, in which the window or door casement has not yet been installed;
- figure 6 shows a cross-section view A-A of the wall in figure 1, in which the window or door casement has not yet been installed;
- figure 7 shows a view in detail of the cross-section A-A which shows the connection between the frame and the wall.

[0020] In all figures, the wall according to the invention is identified throughout by the numeral 100.

[0021] The wall 100 is composed of two panels 1 of sandwich type, each of which is made up of two external layers 2, preferably made of metal, and a filler material 3, such as polyurethane foam or some similar insulation, for example, such as rock wool, positioned between the two external layers 2. The two panels 1 are fixed together in a manner adjacent to each other and configured to define an opening 60 for the insertion of a window or door casement 7, such as a window for example. Said window or door casement 7 includes a frame 6 for connection and fixing to the opening 60 of the wall 100.

[0022] According to one embodiment (not shown), the wall 100 can also be composed of more than two panels 1, or even only a single panel 1, and can include a plurality of openings 60, each one being able to house a window or door casement or more than one window or door casements, while remaining within the scope of the present invention. Moreover, the panels that compose the wall can be constructed with a first external layer in wood, a second external layer in plasterboard, and a filler layer in polystyrene or any other similar insulating material able to guarantee the same insulating properties as polystyrene.

Furthermore, it can also be seen, in the case of a wall of this kind, also known as a composite wall, how the realisation occurs during the construction of the wall itself, and not previously constructed in the plant, as generally occurs for the aforementioned type of prefabricated walls.

[0023] According to the preferred embodiment of the

invention, on the internal side 10 of the wall 100, in other words, the side on the interior of the building once the wall 100 is erected, and along the perimeter 80 of the opening 60, is a first recess 11 which houses the frame 6 of said window or door casement 7. In this manner the

frame 6 of the window or door casement 7, used to attach the window or door casement 7 to the opening 60 of the wall 100, is hidden from view when seen from the exterior because the total height is covered by the first recess 11.

[0024] It should be noted that the first recess 11 can also be realised on the external side 98 of the wall 100 while remaining within the scope of the present invention. Furthermore, it should also be noted that, in the case of composite walls, the first recess is preferably realised on the internal layer of plasterboard, even though a recess realised on the external wooden layer also remains within the scope of the present invention.

[0025] Figure 5 shows a longitudinal cross-section of the wall 100, where it can be clearly seen how the size of the depth D and the height H of the first recess 11 are different along the perimeter 80 of the opening 60. In fact, in the case where the window or door casement 7 contains a compartment 200 (Figure 4) for a roller shutter 201, or roller blind or similar object, the first recess 11, positioned near the upper perimeter 80a of the opening 60, has a depth D and a height H greater than the recess in the other remaining portions of the perimeter 80 of the opening 11. In this manner, the height of the compartment 200 is contained completely within said first perimetric recess 11.

[0026] On the other hand, in the case where the compartment 200 is not included, the depth D of the first recess 11 can be maintained constant around the whole perimeter 80 of the opening 60, provided it covers the height of the frame 6 of the window or door casement 7 preventing it from being visible when seen from the exterior.

[0027] After this stage, the connecting surfaces 61 between the frame 6 of the window or door casement 7 and the first recess 11 define a labyrinth-like path 60 (figure 7). In fact, said connecting surfaces 61, which in a transversal or longitudinal cross-section of the wall 100 assume a step form, define a labyrinth-like path 60 able to solve the problems caused by thermal and acoustic insulation in prefabricated walls. In fact, the air from the exterior is not able to reach the internal side 10 of the wall 100 because it is forced to flow through the labyrinth-like path 60 having a step configuration, causing it to lose energy well before it reaches the internal side 10 of the wall 100.

[0028] Furthermore the mechanical resistance of the wall 100 is increased in relation to that of a prefabricated wall of the known prior art. In fact, unlike the situation present in walls according to prior art, the wall 100 according to the invention foresees that where the frame 6 of the window or door casement 7, is attached in an overlapping manner on the perimeter of the opening, it abuts in contact with the connecting surface 61 a of the first

perimetric recess 11, positioned on the said opening 60. Basically, said first perimetric recess 11 acts as an abutment or shoulder for the frame 6 of the window or door casement 7, encasing it completely within, and maintaining it firmly attached to the wall, as well as covering the total height when seen from the exterior.

[0029] Furthermore the frame 6 of said window or door casement 7 can include means 20 to fix in a removable manner said at least one window or door casement 7 to said wall 100. Said fixing means 20 include at least one bracket 21 inserted between said frame 6 and said first recess 11. In this manner, the window or door casement 7 is attached in a first point 22 to the bracket 21, which in turn, is attached in a second point 23 to the wall 100. In order to detach the window or door casement 7 from the wall, the bracket 21 is simply detached from the wall 100 at the second fixing point 23. Naturally the first fixing point 21 and the second fixing point 23 can also be a plurality of points arranged around the total perimeter of the opening 60.

[0030] Again according to the preferred embodiment of the invention, the wall 100 also includes a second perimetric recess 50 in proximity to the first perimetric recess 11, to house said removable fixing means 20. Practically speaking, in a transversal or horizontal cross-section of the wall 100, the connecting surfaces between the frame 6 and the wall 100 assume a double step or stair configuration (figure 7) where the first step or first recess 11, houses part of the frame 6, while the second step, or second recess 50, houses the said removable fixing means 20. The second perimetric recess 50 is arranged on part of the perimeter of the said first perimetric recess 11, as can be seen clearly in figure 4 where the second recess 50 is visible only on the upper side 11 a of the first recess 11. According to an alternative embodiment, not illustrated herein, the second recess can have a different depth D and height H along the perimeter of the first recess 11, or can be prearranged for the complete perimeter of the recess 11, while remaining within the scope of the present invention. The two connecting surfaces between frame 6 and the two recesses have, in cross-section, a double step configuration which advantageously limits any possible intake of air from the exterior even further, providing a labyrinth-like path which is even more complicated to pass through.

[0031] Again according to the preferred embodiment of the invention, the window or door casement 7 can comprise means for the down flow 30 and collection 31 of the liquid 90 which infiltrates between the internal surface 1a of said panels 1 and that of said window or door casement 7, or inside the window or door casement itself, between the glass and the frame (Figure 4), passing through the seal (not illustrated herein). In this case the wall 100 includes further means 33 to evacuate said infiltrated liquid from said collector means 31. Said means of evacuation 33 comprise several discharge pipes 34 enclosed transversally inside said wall 100 (figure 4) and are conceived to provide a connection means for fluids to flow between

said liquid collector means 31 and the exterior of the building.

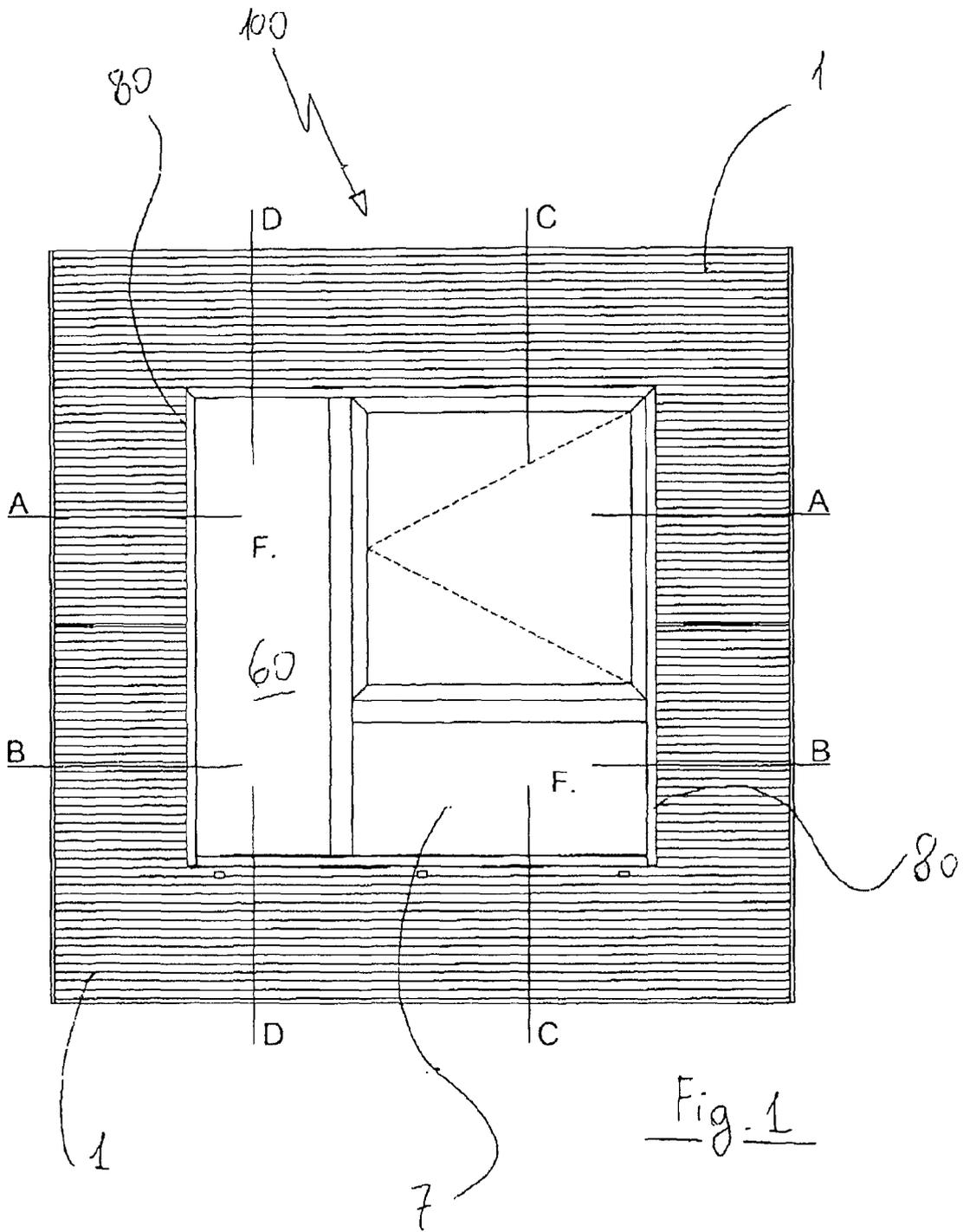
[0032] Lastly, the window or door casement can include two covering elements 95 and 96, respectively for the internal 10 and external 98 sides of the wall 100, for application on the frame 6 in order to improve the aesthetic appearance after the window or door casement 7 has been installed in the opening 60.

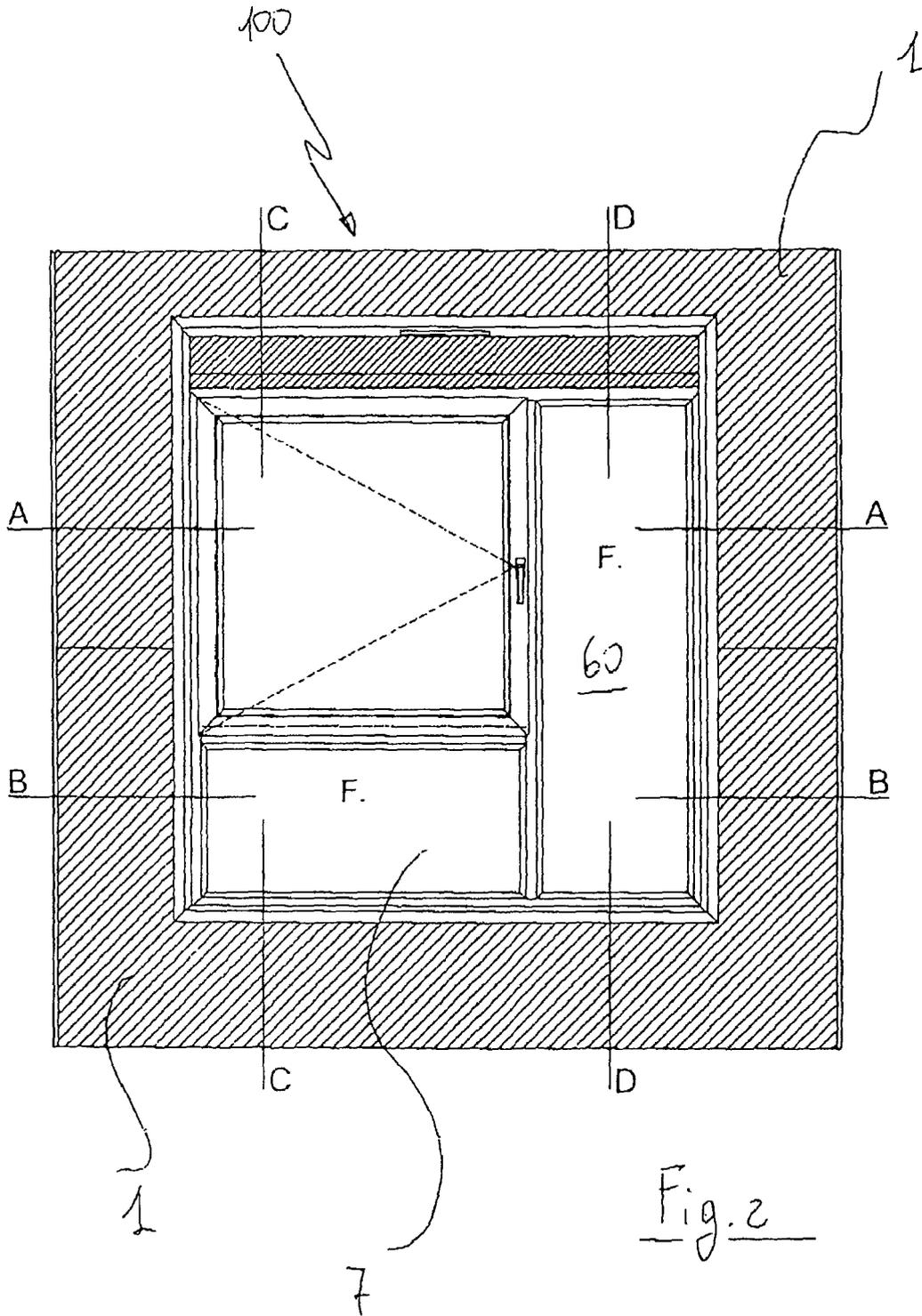
Claims

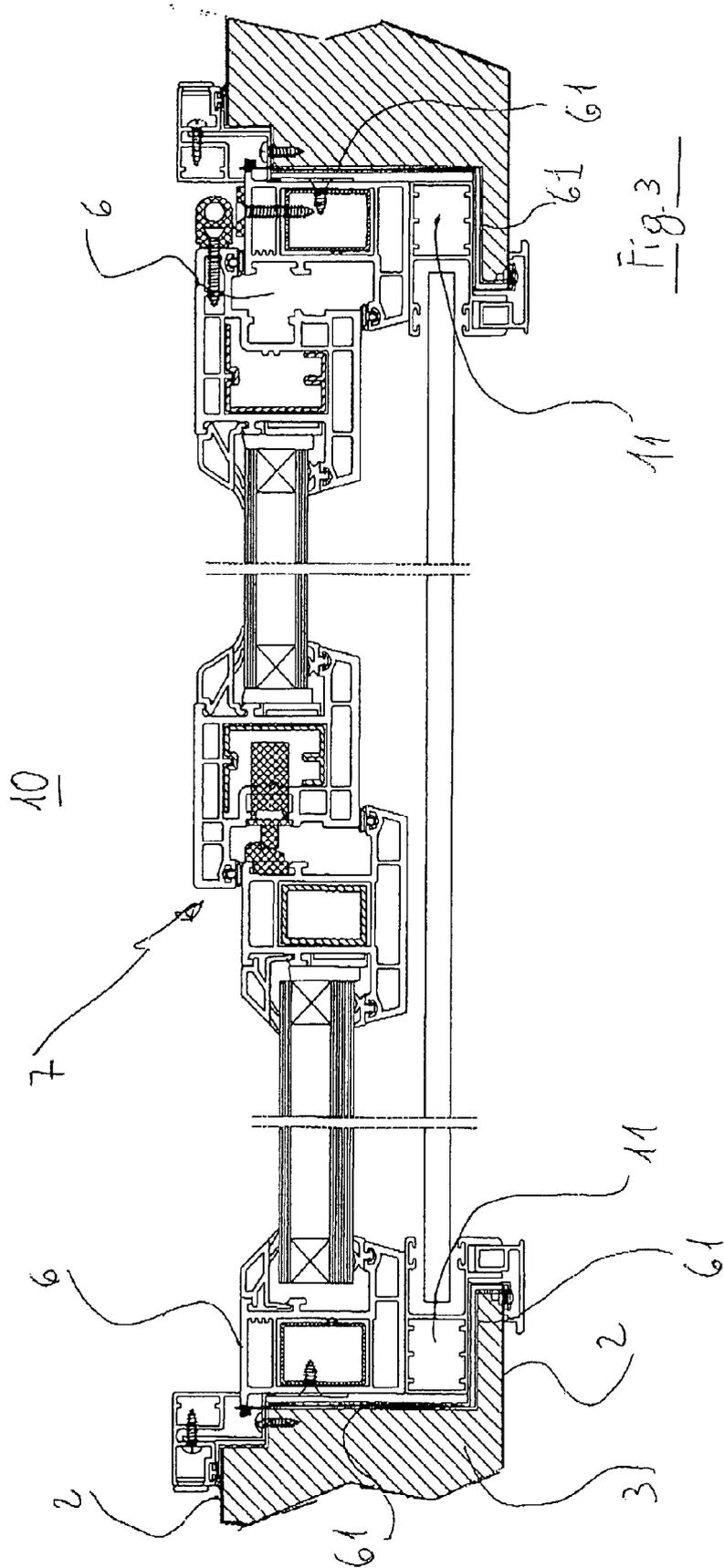
1. Prefabricated or composite wall comprising one or more panels composed of at least two external layers and at least one filler material inserted between said two external layers, said wall furthermore comprising at least one opening formed in, or defined by said one or more panels, and at least one window or door casement having a fixation frame which can be anchored onto the said at least one opening, said wall being **characterised in that**, on at least part of said opening, is a first perimetric recess to house, at least partially, said fixation frame of said window or door casement.
2. Prefabricated wall according to claim 1, **characterised in that** said at least one first perimetric recess is positioned on the internal side of said wall.
3. Prefabricated wall according to claim 1 and/or 2, **characterised in that** said at least one first perimetric recess is positioned along the total perimeter of the said opening.
4. Prefabricated wall according to one or more of the previous claims, **characterised in that** said at least one first recess has different sized depths along different portions of the perimeter of said opening.
5. Prefabricated wall according to one or more of the previous claims, **characterised in that** the height of the frame of said at least one window or door casement is completely contained within said first perimetric recess.
6. Prefabricated wall to one or more of the previous claims, **characterised in that** the connecting surfaces between said frame and the said first perimetric recess define a labyrinth-like path.
7. Prefabricated wall according to one or more of the previous claims, **characterised in that** the frame of said at least one window or door casement includes means for fixing in a removable manner said at least one window or door casement to said wall.
8. Prefabricated wall according to claim 7, **characterised in that** said fixing means include at least one

bracket positioned between said frame and the said first recess, said bracket being fixed to said window or door casement and to said wall in at least two separate points.

9. Prefabricated wall according to claim 7 and/or 8, **characterised in that** it includes a second perimetric recess on at least part of the perimeter of said first perimetric recess, to house said removable fixing means.
10. Prefabricated wall according to any one of the previous claims, wherein said at least one window or door casement includes means for the down flow and collection of the liquid that infiltrates between the internal surface of said one or more panels and that of the said window or door casement, or inside the window or door casement itself, said wall being **characterised in that** it includes further means for the evacuation of said infiltrated liquid from said collector means.
11. Prefabricated wall according to claim 10, **characterised in that** said means of evacuation comprise one or more discharge pipes encased transversally within the said wall and conceived to provide a connection means for fluids to flow between said liquid collector means and the exterior of the building.
12. Prefabricated wall according to any one of the previous claims, wherein said at least one window or door casement includes an upper compartment to contain a roller shutter, or roller blind for said window or door casement, **characterised in that** the total height of said compartment is contained inside the said at least one first perimetric recess.
13. Prefabricated wall according to any one of the previous claims, **characterised in that** it comprises two panels adjacent to each other and configured in a manner to define at least an opening.
14. Prefabricated wall according to any one of the claims from 1 to 12, **characterised in that** it comprises a panel in which an opening is formed.







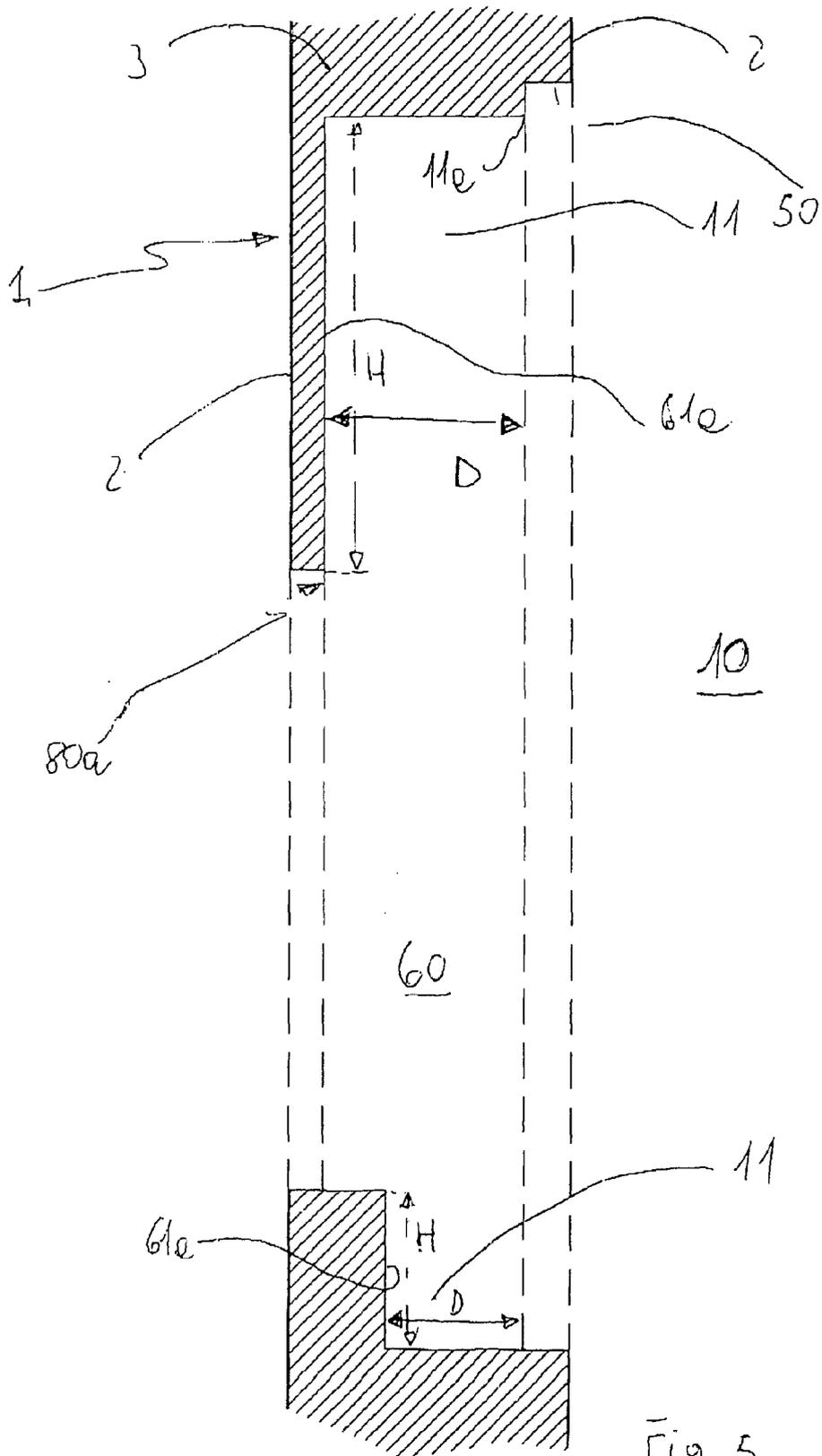
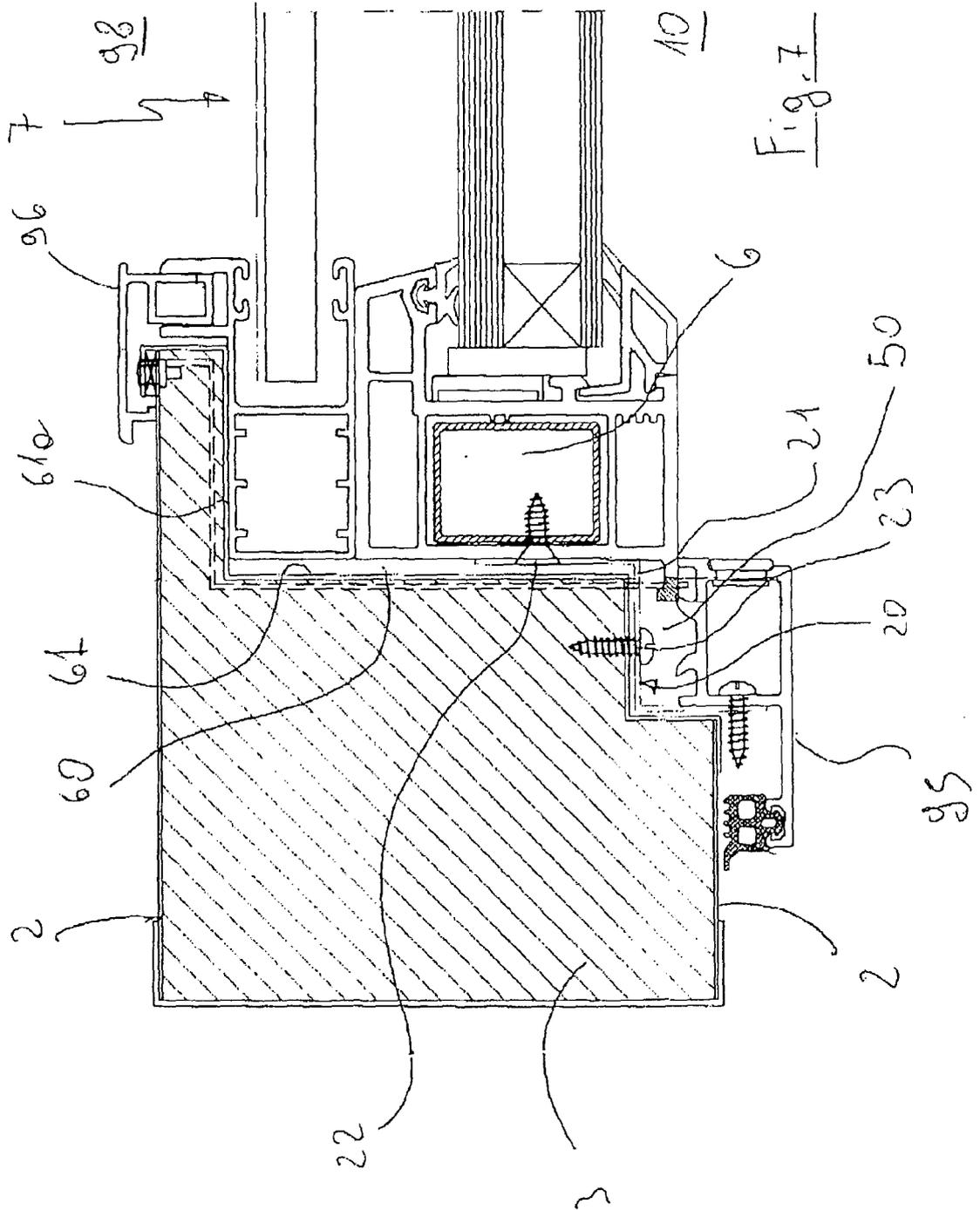


Fig. 5





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 2 315 785 A (COURTNEY) 11 February 1998 (1998-02-11)	1-3,5,6, 10,13,14	INV. E04C2/04
Y	* page 1, line 6 - line 9; claims 1,4-6; figures 1,2 *	7,8	E04C2/288

X	US 3 462 898 A (BALENCY-BEARN) 26 August 1969 (1969-08-26)	1,2,13, 14	
Y	* column 2, line 49 - column 3, line 19; figures 1-3 *	7,8	

			TECHNICAL FIELDS SEARCHED (IPC)
			E04C E04B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 March 2008	Examiner Mysliwetz, Wolfgang
CATEGORY OF CITED DOCUMENTS		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	
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 42 5629

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-03-2008

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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