



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 288 390 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**05.03.2003 Bulletin 2003/10**

(51) Int Cl.7: **E04D 13/03, E06B 9/04**

(21) Application number: **02425464.1**

(22) Date of filing: **15.07.2002**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
IE IT LI LU MC NL PT SE SK TR**  
Designated Extension States:  
**AL LT LV MK RO SI**

(72) Inventor: **Montanelli, Adriano**  
**23848 Oggiono (LC) (IT)**

(74) Representative: **Marietti, Giuseppe**  
**Marietti, Gislon e Trupiano S.r.l.**  
**Via Larga, 16**  
**20122 Milano (IT)**

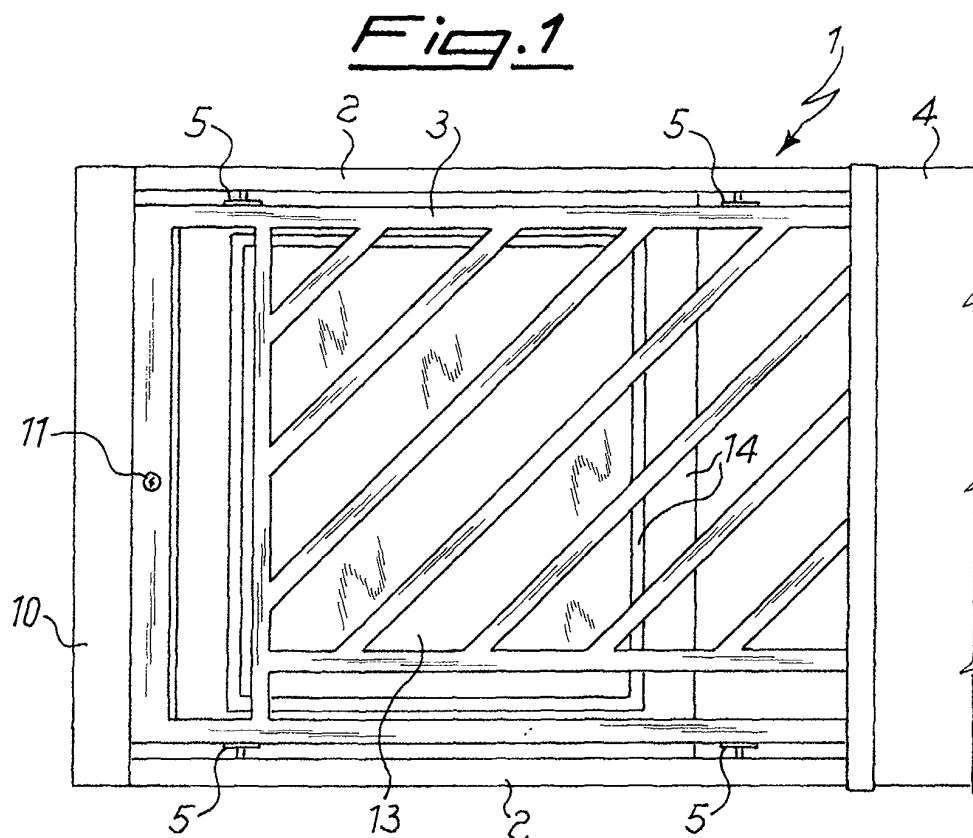
(30) Priority: **03.09.2001 IT MI20010484 U**

(71) Applicant: **Montfin S.r.L.**  
**23862 Civate (LC) (IT)**

(54) **Safety device for opening in slanting roofs**

(57) The safety device for openings made in roofs comprises at least one panel element (3), at least two sliding guides (2) fixed to said roof adjacent to said opening and arranged on opposite sides of said panel element (3), means (5) for engaging said panel element

(3) with said sliding guides (2) to allow only the movement of said panel element (3) between a rest position in which it at least partly frees said opening in the roof and a working position in which it intercepts said opening in the roof.



EP 1 288 390 A1

## Description

**[0001]** The present invention concerns a device for the closure and safety of openings made in roofs and especially in pitched roofs.

**[0002]** The ever increasing necessity, especially in large residential centres, to make use of every space, such as attics, lofts or cellars, as living space, has increased the need to produce ports or openings in walls which are tilted with respect to the horizontal plane.

**[0003]** For this purpose the so-called pivot sash roof windows are known; these windows allow the closure of openings made in roofs, letting the sunlight filter through and, if required, they allow to be opened to ventilate the room. Unfortunately, when open a part of the window protrudes towards the inside of the room, reducing the living space, which is already small, in the area of the opening or port.

**[0004]** Windows with a compass opening for roofs are also known; these windows have a hinge on one side, usually the side facing the top of the roof, and they open by rotating the whole window towards the outside with respect to the hinge. The windows with compass opening do not present the drawback of reducing the living space in the window area, but the particular opening mechanism usually allows only a limited rotation of the window and does not allow a high flow of air inside the room. On the contrary, windows with compass opening which allow a large angle of rotation of the frame with respect to the hinge are particularly difficult to close and for this reason they must be equipped with auxiliary closing systems of a mechanical type, such as special bars that are not comfortable to use, or of an electric type, such as electric motors which are often complex and not very reliable. Nor do any of the types of windows mentioned above present anti-intruder safety features. To overcome this problem, windows have been proposed that are provided with fixed gratings positioned on the outside of the window itself. However the fixed gratings do not allow the window to be opened, or allow it to be opened towards the inside of the room and in this case they do not solve the problems of reducing the living space as described above.

**[0005]** Moreover, the presence of fixed gratings is not welcome to the user, who sees his home transformed into a private prison on account of the presence of the fixed gratings.

**[0006]** An object of the present invention is therefore to realise a safety device for closing ports or openings made in roof walls, especially in pitched roofs, which guarantees the inviolability of the premises, preventing access through the opening itself.

**[0007]** Another object of the present invention is to provide a safety device which, once installed, can be concealed from view when necessary and which does not notably reduce the lighting of the room.

**[0008]** Another object of the present invention is to provide a safety device which allows easy opening of

the window for ventilation of the room and which is at the same time simple and economic to produce.

**[0009]** These and other objects are achieved by the present invention which concerns a safety device for openings made in roofs characterised in that it comprises at least one panel element, at least two sliding guides fixed to said roof adjacent to said opening and arranged on opposite sides of said panel element, means for engaging said panel element with said sliding guides to allow only the movement of said panel element between a rest position in which it at least partly frees said opening in the roof and a working position in which it intercepts said opening in the roof.

**[0010]** The great simplicity of construction of the device to which the present invention refers makes it particularly suitable for installation in any type of roof, guaranteeing the inviolability of the opening on which it is fitted.

**[0011]** According to a preferential aspect of the present invention, the safety device comprises housing means, from which the guides are extended, for at least partially containing said panel element, in its rest position.

**[0012]** In this way it is possible to keep the panel element normally inside the housing, unseen by the persons present in the room, and to move it into closing position, that is to intercept the opening only when necessary.

**[0013]** According to a preferential aspect of the present invention, the safety device also comprises means for blocking the position of the panel element with respect to the opening to be intercepted.

**[0014]** In this way, access to the room through the opening made in the roof is blocked.

**[0015]** According to an advantageous aspect of the present invention, the means for blocking the panel element comprise a cross member placed across the two sliding guides and at least one lock for securing the element to the cross member.

**[0016]** According to an advantageous aspect of the present invention, the panel element comprises at least one metal grating which, once closed, prevents any attempted intrusion while allowing the sunlight to penetrate inside the room and not preventing the opening of the window on which the safety device is fitted.

**[0017]** Further characteristics and advantages of the present invention will be more clearly seen from the following description, provided for illustrative purposes without limitation, with reference to the enclosed schematic drawings in which:

- figure 1 is a schematic side view of a safety device for openings made in pitched roofs according to the present invention;
- figure 2 is a schematic side view of the safety device in figure 1 from the side opposite the one previously shown;
- figure 3a represents a schematic view of a means

- of engagement according to the present invention;
- figure 3b represents a schematic view of an alternative embodiment of a means of engagement according to the present invention;
- figure 4 is a partial schematic view of the device according to the present invention embedded in the roof;
- figure 5 is a schematic view of an alternative embodiment of the device according to the present invention;
- figure 6 is a schematic side view of a further embodiment of the safety device for openings made in pitched roofs according to the present invention.

**[0018]** Figure 1 represents a possible embodiment of a safety device 1 for openings made in pitched roofs comprising a panel element 3 and two sliding guides 2 fixed in the wall adjacent to the opening and arranged on opposite sides of said panel element. In this description the term "adjacent to the opening" means both an arrangement of the guides in which one is located above and one below the window opening so as to follow the same opening for at least part of its width, that is an arrangement in which the guides are adjacent to the wall above and below the opening, and an arrangement in which the guides are still located one above and one below the opening, but they stop before they reach it, in other words they are adjacent to a side wall of the opening.

**[0019]** Preferably, the two sliding guides 2 are arranged parallel to an horizontal plane, but, without departing from the field of protection of the present invention, they could be arranged parallel to the inclination of the roof, or they could be tilted with respect to this inclination.

**[0020]** The safety element 3, represented in this embodiment by a rectangular metal grating, is engaged in a sliding manner, by means of suitable means of engagement 5, to the sliding guides 2 which block any movement of it except the movement between a rest position in which the panel element 3 frees the opening made in the roof and a working position in which it intercepts the opening in the roof.

**[0021]** The two sliding guides 2 adapted for movement of the panel element 3 protrude from housing means 4 arranged on the opening in the roof and extend for the whole width of the opening.

**[0022]** The housing means are represented by a shell frame 4 which substantially presents a parallelepiped shape open on at least one side and suited for containing the safety element 3 when it is in rest position.

**[0023]** The particular shape of the shell frame 4 allows the panel element, represented in this particular embodiment by the grating 3, to slide completely within the shell frame 4, remaining concealed and opening the access to the aperture to be intercepted.

**[0024]** Once the device of the present invention has been installed in the roof 20, as shown in figure 4, the

frame 4 and the sliding guides 2 are completely embedded in the roof 20 and are therefore concealed from view. In this way, when the panel element 3 is in rest position inside the frame 4, it is completely concealed.

**[0025]** The opening made in the roof 20 on which the device 1 has been installed is in turn closed by a window 13 of the known type, for example with compass opening towards the outside.

**[0026]** On the opposite sides of the panel element in correspondence to the sliding guides 2, as mentioned above means of engagement 5 are provided for, suited for engaging the panel element 3 with the sliding guides 2 and for allowing the sliding of the element itself with respect to the opening to be intercepted.

**[0027]** In detail, these means of engagement 5 are represented, as may be seen in figure 3a, by a threaded pin 6 associated with the panel element 3 and by a rotating element 9 such as a roller, equipped with ball bearings, hinged onto the remaining end of the pin 6 and able to slide in a guide 2. In detail, the threaded pin 6 is blocked by a bolt 7 in a special slot of a flange 8 applied on the panel element 3 and supports, in a rotating manner, the sliding roller 9. In an alternative embodiment, shown in figure 3b, the means of engagement 5 are represented by a carriage 25 associated with the panel element 3 and provided with two or more rotating elements, such as for example rollers 9', which allow it to slide within the guide 2. Also in this embodiment the threaded pin 6 which supports the carriage 25 is blocked by a bolt 7' in a special slot on a flange 8' applied to the panel element 3.

**[0028]** Advantageously, the panel element 3 presents two pairs of means of engagement 5, each pair being arranged on the opposite sides of the panel element facing the sliding guides 2. In this way the weight of the device 1 is distributed partly on the upper portion of the roof and partly on the lower portion.

**[0029]** The terms upper and lower portion of the roof 20 mean the two portions into which the roof 20 is divided by the centre line of the opening to be intercepted.

**[0030]** Corresponding to at least one end of the sliding guides 2, in a position opposite the shell frame 4, there is a cross member 10 which gives stability to the structure and at the same time allows the position of the panel element 3 to be blocked with respect to the opening to be intercepted.

**[0031]** In detail, the panel element 3 presents as blocking means 11 a lock suited for securing the panel element 3 against the cross member 10 in order to close the opening made in the roof 20 and to prevent entrance to the room through the window opening. In an alternative embodiment, the device 1 presents automatic means for moving the panel element from its working position to its rest position and vice versa. Automatic means of this type are known in the technique of moving closing elements and are available on the market; these means are not the subject of the present invention and are not illustrated in the enclosed drawings.

[0032] As already mentioned, the panel element here is represented by a metal grating 3 installed in a concealed manner in a pitched roof 20 on an opening or port to be intercepted. Alternatively, the panel element could be any barrier element of any shape made of metal, such as an electrowelded grating or cut-resistant bars, or other materials suitable for the purpose.

[0033] Again without departing from the field of protection of the present invention, in order to allow a reduction of the space for applying the device, the safety element 3 may be a grating of extendible type, that is one of those gratings which can be extended to form a panel in working position or folded like a concertina in rest position. In this way it is in fact possible to provide a shell frame 4 with compact dimensions for containing the panel element in rest position.

[0034] The port or opening in the roof is closed by a window 13 with hinged frame 14 fitted, as shown in figure 2, by means of a pair of bracket supports 15 onto the device 1 to which the invention refers.

[0035] The preferential embodiment of the present invention, shown in figures from 1 to 3, allows to safety block the access to the room through the opening made in the roof, but allows the passage of sunlight to light the room and offers the possibility of opening the window 13 with a compass frame 14 or a pivot sash to ventilate the room.

[0036] In the embodiment shown in figure 5 the device 1 to which the present invention refers is intended to be applied on a window already existing in the roof. In this case, in order to avoid further expensive masonry work, the two sliding guides 2 and the shell frame 4 present a plurality of fixing points to the wall of the roof 20 corresponding to and alongside the port or opening to be intercepted. For fixing it to the wall, the device 1 has support brackets 21 corresponding to the guides 2 and the frame 4 and which, when engaged with dowels of a known type, guarantee the installation of the device 1 on the wall.

[0037] Moreover, to ensure that the installation of the device on the wall in a manner not embedded in the roof 20, does not have an unattractive appearance, a covering case 22 is provided. In other words, the device is provided with a covering element 22 which reproduces the forms of the sliding guides 2, of the frame 4 and of the cross member 10, but which leaves uncovered the port to be intercepted.

[0038] The covering case 22 is made of finishing material, such as aluminium or fibreglass, and is fixed to the safety device 1 with special support means such as screws 23 and fitting portions.

[0039] To overcome the problem of the limited opening width of the window 13 with compass frame 14, the safety element 3 could be a window 13 able to slide within a shell frame; in that case, since the metal grating is not present, safety against attempted intrusion could be guaranteed by armoured and/or shatterproof glass.

[0040] In a further embodiment, without departing

from the scope of the present invention, two sliding panel elements 3 are foreseen, in particular a grating and a window both sliding independently inside the shell frame.

[0041] In this way the advantages of safety determined by the presence of the grating are combined with the advantages of a wide opening of the port determined by the hide-away window.

[0042] In all the shown embodiments of the present invention, the sliding guides 2 are arranged parallel to the horizontal plane, but they could also be arranged parallel to the inclination of the roof or on the vertical walls of dormer windows. In these cases, in order to encourage the upward sliding of the panel element 3, the panel element itself will be connected, by means of a cable and a pulley, to a counterweight. This embodiment is particularly suitable for use, as described above, on dormer windows where any presence of fixed gratings would make it impossible to open the window.

[0043] Many modifications and variations may of course be made to the embodiments of the invention described above without departing from the field of protection of the same; for example, it is possible to use as a panel element, as shown in figure 6, two metal gratings 3,3a, each of which may be moved between a rest position, in which it is completely concealed in a shell frame 4,4a, and a working positioning in which it intercepts a portion of the opening on which the device is applied.

[0044] In this case there are two shell frames 4,4a corresponding to the ends of the sliding guides 2 in opposite positions to each other.

## Claims

1. A safety device for openings made in roofs **characterised in that** it comprises at least one panel element, at least two sliding guides fixed to said roof adjacent to said opening and arranged on opposite sides of said panel element, means for engaging said panel element with said sliding guides to allow only the movement of said panel element between a rest position in which it at least partly frees said opening in the roof and a working position in which it intercepts said opening in the roof.
2. A safety device for openings according to claim 1, **characterised in that** it comprises housing means, from which the guides are extended, for at least partially containing said panel element, in its rest position.
3. A safety device according to any one of the previous claims, **characterised in that** it comprises means for blocking the position of the panel element with respect to the opening to be intercepted.
4. A safety device according to claim 3 **characterised**

**in that** said means for blocking the position of said panel element comprise a cross member placed across the two sliding guides and at least one lock for securing the element to said cross member.

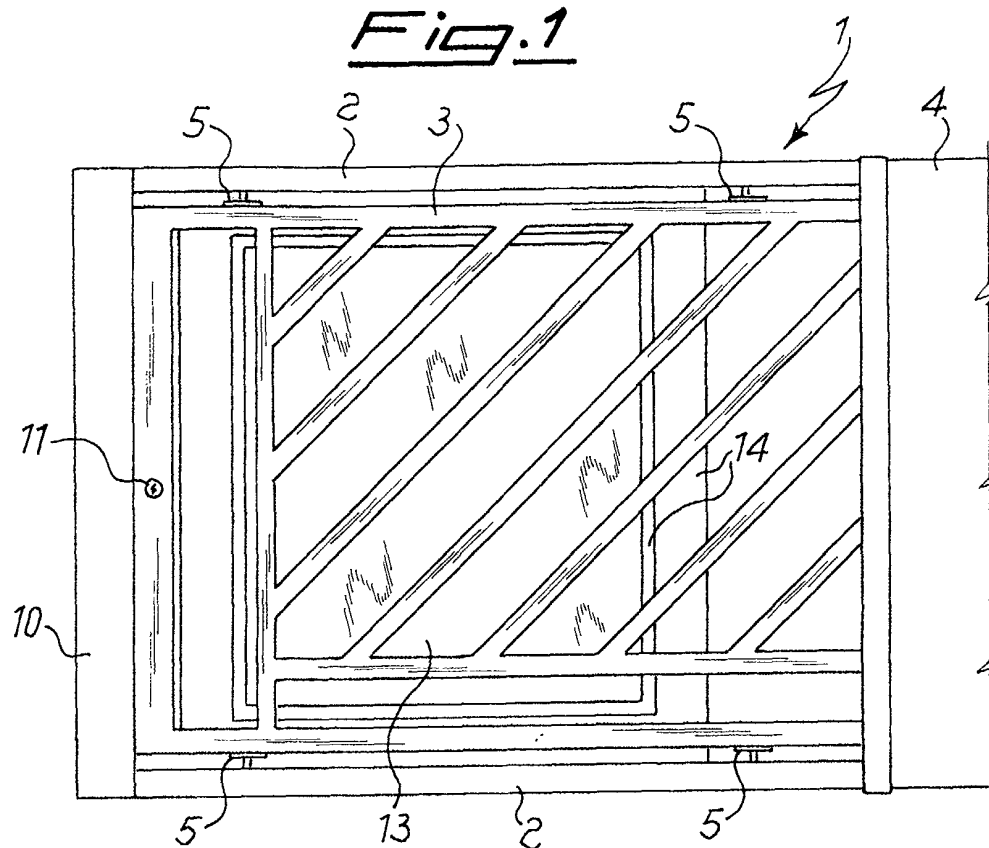
5

5. A safety device according to any one of the previous claims from 1 to 4, **characterised in that** said panel element comprises at least one metal grating.
6. A safety device according to claim 5, **characterised in that** said panel element comprises at least one extendible metal grating. 10
7. A safety device according to any one of the previous claims from 1 to 4, **characterised in that** said panel element comprises at least one window with shatterproof and/or armoured glass. 15
8. A safety device according to any one of the previous claims, **characterised in that** said panel element comprises at least one window and at least one grating sliding separately to intercept said opening. 20
9. A safety device according to any one of the previous claims, **characterised in that** it comprises automatic means for moving said panel element between said rest position and said working position. 25
10. A safety device according to any one of the previous claims from 1 to 7, **characterised in that** said sliding guides and said panel element can be applied on windows already existing in the roof. 30
11. A safety device according to claim 10, **characterised in that** it comprises a covering element that can be associated with the device installed to contain and conceal from view said at least one shell frame, said at least two guides and said cross member. 35
12. A safety device according to any one of the previous claims, **characterised in that** said means of engagement comprise rotating elements to allow only the movement of said panel element. 40
13. An assembly box for safety device **characterised in that** it comprises one or more elements that can be assembled to realise a device according to any one of the previous claims. 45

50

55

*Fig.1*



*Fig.2*

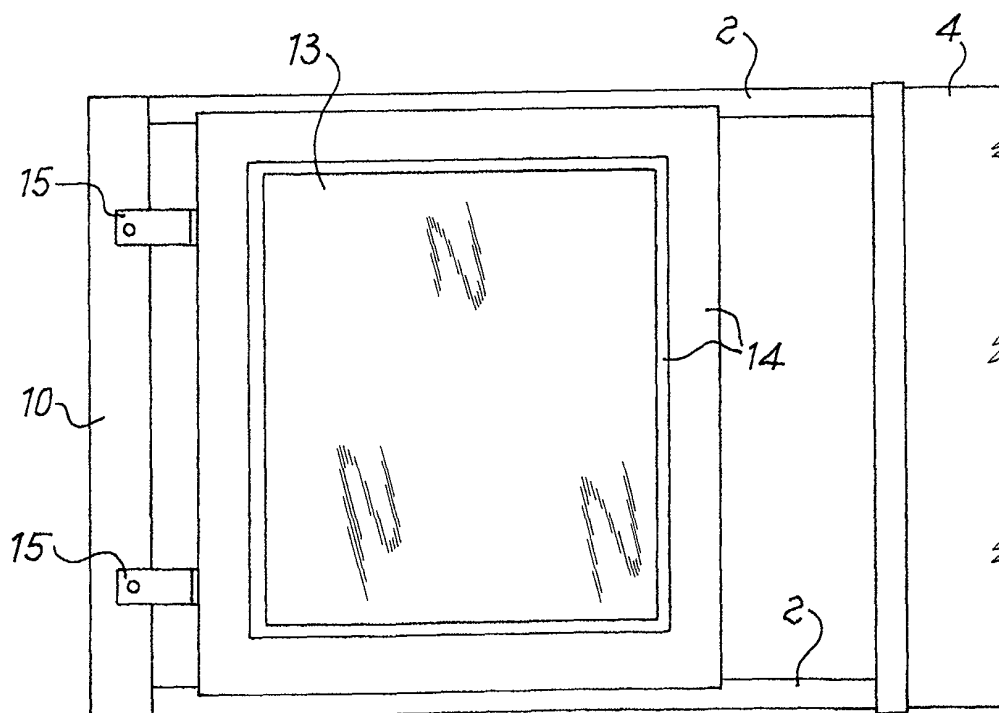


Fig. 3a

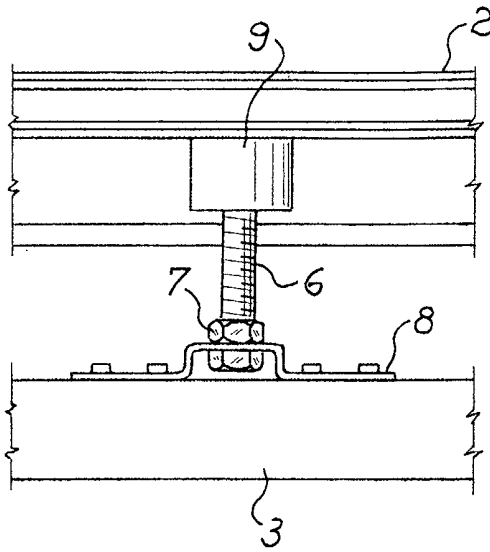


Fig. 3b

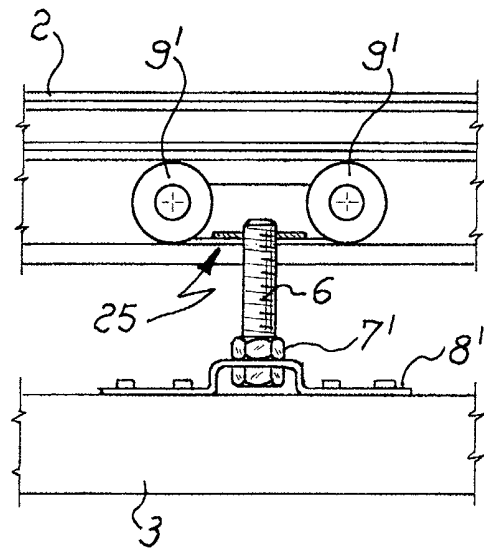
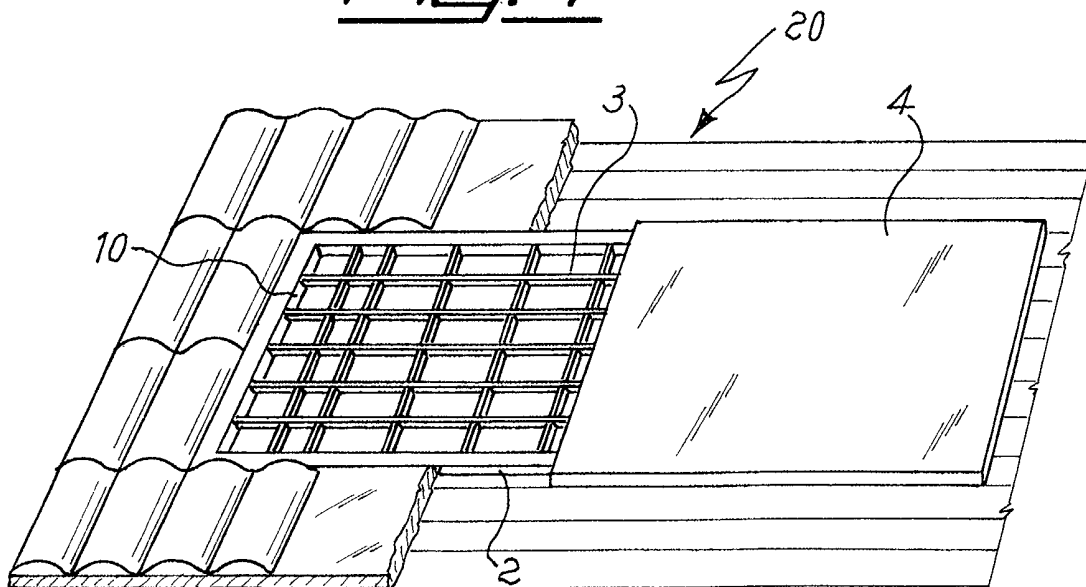
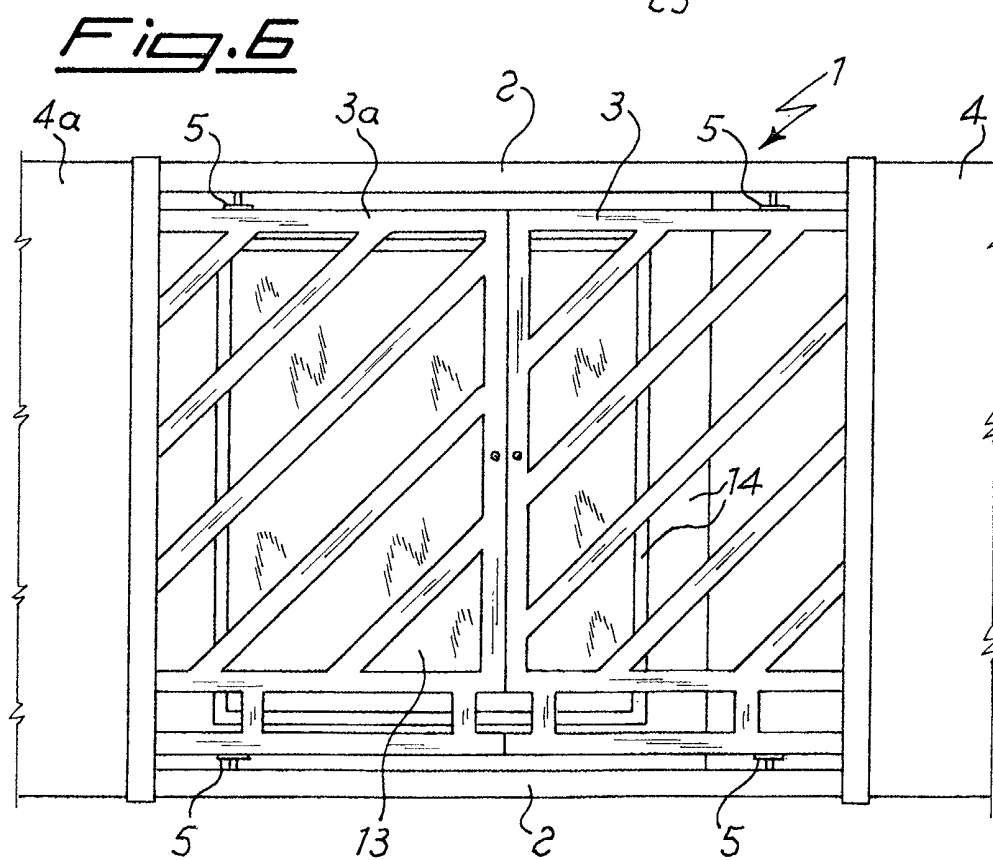
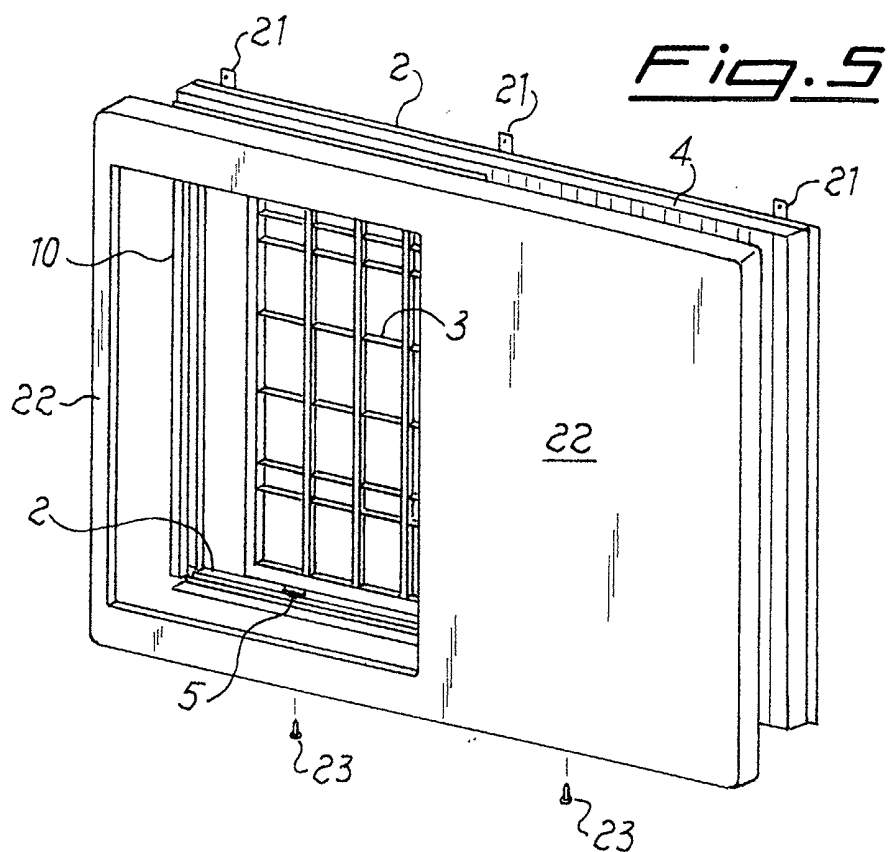


Fig. 4







European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 02 42 5464

| 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.7) |
| X                                                                                                                                                                                                                       | DE 41 26 283 A (SCHANO JOSEF)<br>17 September 1992 (1992-09-17)                                                                                                    | 1,3,5,<br>10,12,13                                                                                                                                                                                                                                                           | E04D13/03<br>E06B9/04                        |
| Y                                                                                                                                                                                                                       | * the whole document *                                                                                                                                             | 2,7,9,11                                                                                                                                                                                                                                                                     |                                              |
|                                                                                                                                                                                                                         | ---                                                                                                                                                                |                                                                                                                                                                                                                                                                              |                                              |
| X                                                                                                                                                                                                                       | FR 2 768 164 A (GODEFROY GERARD)<br>12 March 1999 (1999-03-12)<br>* page 3, line 6 - page 3, line 16 *<br>* page 4, line 15 - page 5, line 12 *<br>* figures 1-3 * | 1-6,8,9,<br>12,13                                                                                                                                                                                                                                                            |                                              |
|                                                                                                                                                                                                                         | ---                                                                                                                                                                |                                                                                                                                                                                                                                                                              |                                              |
| Y                                                                                                                                                                                                                       | DE 34 43 212 A (GEWALD LUDWIG)<br>28 May 1986 (1986-05-28)<br>* figures 1-4,9 *                                                                                    | 2,9,11                                                                                                                                                                                                                                                                       |                                              |
|                                                                                                                                                                                                                         | ---                                                                                                                                                                |                                                                                                                                                                                                                                                                              |                                              |
| Y                                                                                                                                                                                                                       | DE 29 42 958 A (HARTL KURT)<br>30 April 1981 (1981-04-30)<br>* claims 1,16; figures 1-5 *                                                                          | 7                                                                                                                                                                                                                                                                            |                                              |
|                                                                                                                                                                                                                         | ---                                                                                                                                                                |                                                                                                                                                                                                                                                                              |                                              |
| A                                                                                                                                                                                                                       | FR 2 574 846 A (ALAZARD JULES)<br>20 June 1986 (1986-06-20)<br>* claim 1; figures 1,2,4 *                                                                          | 2,8,10,<br>13                                                                                                                                                                                                                                                                |                                              |
|                                                                                                                                                                                                                         | -----                                                                                                                                                              |                                                                                                                                                                                                                                                                              |                                              |
|                                                                                                                                                                                                                         |                                                                                                                                                                    |                                                                                                                                                                                                                                                                              | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.7)      |
|                                                                                                                                                                                                                         |                                                                                                                                                                    |                                                                                                                                                                                                                                                                              | E04D<br>E06B                                 |
| The present search report has been drawn up for all claims                                                                                                                                                              |                                                                                                                                                                    |                                                                                                                                                                                                                                                                              |                                              |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                     |                                                                                                                                                                    | Date of completion of the search<br><b>8 November 2002</b>                                                                                                                                                                                                                   | Examiner<br><b>Hendrickx, X</b>              |
| CATEGORY OF CITED DOCUMENTS                                                                                                                                                                                             |                                                                                                                                                                    | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                              |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                    |                                                                                                                                                                                                                                                                              |                                              |

EPO FORM 1503 03/02 (P04C01)

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

EP 02 42 5464

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.

08-11-2002

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---|---------------------|----------------------------|---------------------|
| DE 4126283                                | A | 17-09-1992          | DE 4008093 A1              | 24-10-1991          |
|                                           |   |                     | DE 4126283 A1              | 17-09-1992          |
| FR 2768164                                | A | 12-03-1999          | FR 2768164 A1              | 12-03-1999          |
| DE 3443212                                | A | 28-05-1986          | DE 3443212 A1              | 28-05-1986          |
| DE 2942958                                | A | 30-04-1981          | DE 2942958 A1              | 30-04-1981          |
| FR 2574846                                | A | 20-06-1986          | FR 2574846 A1              | 20-06-1986          |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82