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(54) SKYLIGHT ASSEMBLY WITH SEAL

(57) Skylight assembly, particularly for installation in an inclining surface, comprising a window frame (100) and a window (200) which is mounted movably in the window frame, wherein the window comprises a frame (210), a first window pane (220) received in the frame and, arranged thereabove, a second window pane (230), **characterized in that,** on a side (201) of the window which is intended to form a lower side, the second window pane extends beyond the first window pane over the frame, wherein provided between the frame and the second window pane is a seal (300) which is configured to seal the space between the frame and the second window pane, even in the event of deformation of the second window pane.

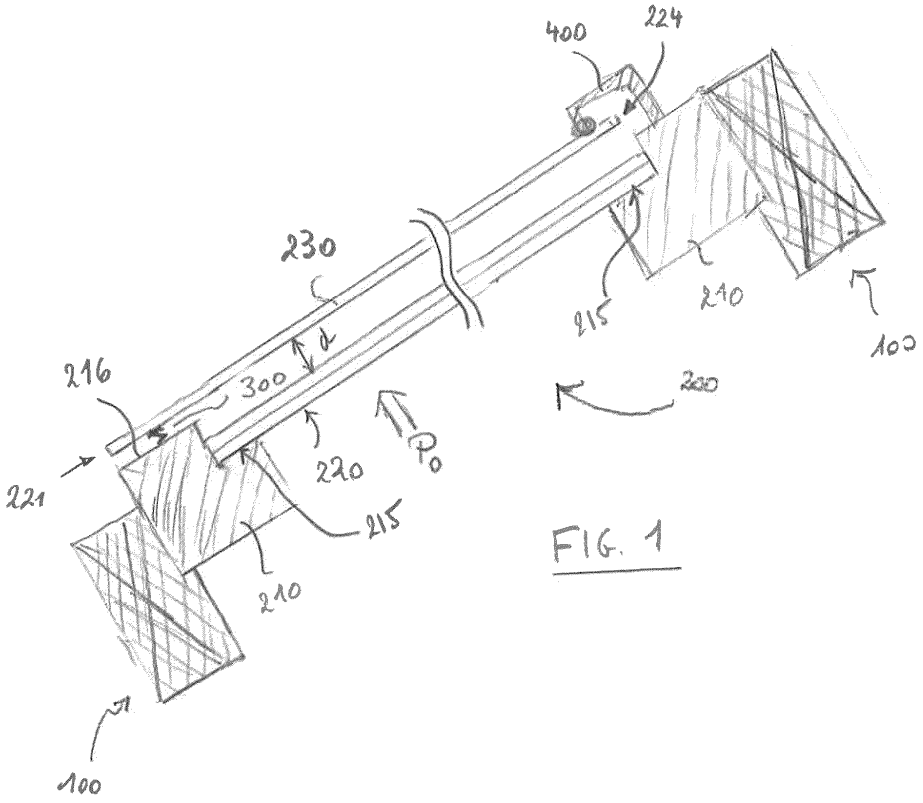


FIG. 1

EP 3 872 275 A1

Description

Field of the invention

[0001] The present invention relates to a window assembly, particularly a skylight assembly intended to be built into an inclining surface such as a roof.

Background

[0002] The use of a window assembly allows more daylight to come indoors. Ventilation and visual contact with the outside world also become possible when the window assembly is integrated in a roof. Skylights for sloping roofs typically comprise a fixed window frame and a window mounted tiltably therein. Examples of such window assemblies are generally known to the skilled person. A particularly advantageous embodiment of such a skylight assembly is disclosed in European patent EP 2 792 810 B1 in the name of applicant. When opening such a skylight, the upper part of the window tilts inward, while the lower part can tilt outward.

[0003] The window comprises a frame and one or more window panes mounted in or on the frame. In determined embodiments an outer window pane can have the tendency to bulge as a result of pressure differences between an outer and inner side of the outer window pane, resulting in an undesired airflow under the outer window pane. The undesired airflow between the window pane and the frame results in heat loss and, when there is a lot of wind, can produce an annoying sound.

Summary of the invention

[0004] Embodiments of the invention have for their object to improve the airtightness of a window assembly, and particularly the airtightness of the window, even if the outer window pane has a bulge.

[0005] A first aspect of the invention relates to a skylight assembly, particularly for installation in an inclining surface. The skylight assembly comprises a window frame and a window which is mounted movably in the window frame. The window comprises a frame and a first window pane received in the frame and, arranged thereabove, a second window pane. On a side of the window which is intended to form a lower side, the second window pane extends beyond the first window pane over the frame. Provided between the frame and the second window pane is a seal which is configured to seal the space between the frame and the second window pane, even in the event of deformation of the second window pane.

[0006] The seal, which is configured to seal the space between the frame and the second window pane even in the case of deformation of the second window pane, will prevent an unpleasant airflow between the frame and the second window pane. This ensures that the thermal insulation of the window is better preserved and that there is no annoying sound during high wind speeds.

[0007] The seal preferably comprises a flexible element which is fastened between the frame and the second window pane. The flexibility of the flexible element is then preferably chosen such that a bulging of the second window pane can be accommodated.

[0008] The flexible element is preferably adhered to the second window pane, for instance with an adhesive. The flexibility and the adhesion ensure that the flexible element adapts to the bulge of the second window pane when it changes due to the effect of a pressure difference.

[0009] According to a preferred embodiment, the flexible element is adhered to the second window pane by means of a tape. In this way the mounting of the flexible element can take place in simple manner.

[0010] The flexible element is preferably likewise adhered to the frame, for instance by means of a tape.

[0011] According to a possible embodiment, the flexible element is configured to move from a more folded or creased position to a less folded or creased position in the event of bulging of the second window pane. The flexible element can thus be embodied as a kind of concertina and thus easily compensate for differences in distance between the second window pane and the frame.

[0012] According to a possible embodiment, the flexible element is configured to be stretched elastically in the event of bulging of the second window pane. Because it is elastically deformable, differences in distance between the second window pane and the frame can be accommodated. The skilled person will appreciate that the flexible element can also combine a concertina action with an elastic deformability.

[0013] According to a preferred embodiment of the window assembly, the first window pane has an upper edge, a lower edge and two side edges. The upper edge and/or the two side edges are provided with a peripheral profile, while the lower edge lies clear. In this way, when it rains, rainwater can be discharged easily along the lower edge without being obstructed by a peripheral profile. The peripheral profile along the upper edge and/or along the two side edges further provides for a good finish and seal.

[0014] The first window pane preferably comprises a laminated glass. This laminated structure increases the insulation value of the window assembly. In addition, laminated glass also has the advantage of being burglarproof, this increasing the safety of the window assembly. The laminated glass preferably comprises at least two glass layers and a plastic layer which holds the glass layers together in the case of breakage. The laminated structure also has the advantage relative to single glazing that the sound insulation is improved.

[0015] The second window pane preferably comprises a pane of glass. This pane of glass forms a first protection of the window assembly against external impact, and further increases the insulation value of the window assembly.

[0016] According to a preferred embodiment of the window assembly, the frame is provided with a recess on an inner periphery. The recess forms a support for the first

window pane.

[0017] The second window pane is preferably supported on the frame at a distance from the first window pane.

[0018] According to a preferred embodiment of the window assembly, the window is mounted pivotally in the window frame such that an upper side of the window can tilt inward and preferably such that a lower side of the window can tilt outward.

[0019] According to a further developed embodiment, the window assembly comprises a screen which is connected pivotally to an upper edge of the window frame at an upper edge. The window has a lower side which is connected slidably and pivotally to the screen, such that the screen can be tilted outward by tilting the upper side of the window inward. This provides the option of tilting the window wholly outward to a vertical position, whereby the second window pane is easily accessible in this position. It is hereby possible to clean this side of the window assembly from inside. The screen can further be equipped to fulfil a determined function: insect screen, sun protection, blackout blind, and so on. A possible embodiment is described in detail in EP 2 792 810 B1 in the name of applicant, which is included here by way of reference.

Brief figure description

[0020] The above stated and other advantageous features and objects of the invention will become more apparent, and the invention better understood, on the basis of the following detailed description when read in combination with the accompanying drawings, in which:

Figure 1 shows a schematic cross-section through an embodiment of a skylight assembly in an inclining surface;

Figure 2 shows a schematic perspective view of the window of the embodiment of figure 1;

Figure 3 shows a schematic perspective view of a preferred embodiment of a window assembly;

Figure 4A shows a schematic top view of the window assembly of figure 3;

Figure 4B shows a schematic cross-section along IVB in figure 4A;

Figure 4C shows a detail view of zone IVC in figure 4B; and

Figure 5 shows a side view of yet another embodiment of a skylight assembly in an inclining surface.

Detailed embodiments

[0021] Figures 1 and 2 illustrate a first embodiment of a skylight assembly, particularly for installation in an inclining surface. The skylight assembly comprises a window frame 100 and a window 200 which is mounted movably in window frame 100. Window 200 comprises a frame 210, a first window pane 220 received in frame 210 and, arranged thereabove, a second window pane 230. On a side 201 of the window, which is intended to form a lower side 201, the second window pane 230 extends beyond the first window pane 220 over the frame 210. Provided between frame 210 and second window pane 230 is a seal 300 which is configured to seal the space between frame 210 and second window pane 230, even in the event of deformation of second window pane 230. Seal 300 is operative between an upper side 216 of frame 210 and the second window pane 230. The airtightness of the window assembly, and particularly the airtightness of window 200, is improved in this way, even if outer window pane 230 has a bulge B as shown in broken lines in figure 2. An unpleasant airflow between frame 210 and second window pane 230 will be prevented by the seal 300, which is configured to seal the space between frame 210 and second window pane 230, even in the event of deformation of second window pane 230. This ensures that the thermal insulation of window 200 is better preserved and that there is no annoying sound during high wind speeds.

[0022] Seal 300 preferably comprises a flexible element which is fastened between frame 210 and second window pane 230. The flexibility of the flexible element is then preferably chosen such that a bulge B of second window pane 230 can be accommodated. The flexible element is preferably adhered to the second window pane 230, for instance with an adhesive. The flexibility and the adhesion ensure that the flexible element adapts to the bulge B of second window pane 230 when this window pane changes due to the effect of a pressure difference. This can for instance be the case when an overpressure Po prevails inside. The flexible element can for instance be adhered to second window pane 230 by means of a double-sided adhesive tape. In this way the mounting of the flexible element can take place in simple manner. The flexible element is preferably likewise fastened to frame 210, for instance by means of a tape.

[0023] According to a possible embodiment, the flexible element is configured to move from a more folded or creased position to a less folded or creased position in the event of bulging B of second window pane 230. The flexible element can thus be embodied as a kind of concertina and thus easily compensate for differences in distance between second window pane 230 and frame 210. According to another possible embodiment, the flexible element is configured to be stretched elastically in the event of bulging B of second window pane 230. Because it is elastically deformable, differences in distance between second window pane 230 and frame 210 can be accommodated. The skilled person will appreciate that the flexible element can also combine a concertina action with an elastic deformability.

[0024] First window pane 220 has an upper edge 224, a lower edge 221 and two side edges 222, 223. The upper edge 224 and the two side edges 222, 223 are provided with a peripheral profile 500, while the lower edge 221 lies clear. In this way rainwater can be discharged easily along lower edge 221 without being obstructed by any

peripheral profile. Peripheral profile 500 along upper edge 224 and along the two side edges 222, 223 further provides for a good finish and seal of window 200.

[0025] The first window pane 220 preferably comprises a laminated glass. The second window pane 230 is preferably a pane of glass. Frame 210 is provided with a recess 215 on an inner periphery thereof. The recess forms a support for first window pane 220. Second window pane 230 is preferably supported on frame 210 at a distance d from first window pane 220.

[0026] Figures 3 and 4A-4C illustrate a second embodiment of a skylight assembly for an inclining surface, wherein similar components are designated with the same reference numerals as in the embodiment discussed above. Window 200 is mounted pivotally in window frame 100 such that an upper side 204 of window 200 can tilt inward and such that a lower side 201 of window 200 can tilt outward. The window assembly comprises here a screen 400 which is connected pivotally to an upper edge 104 of window frame 100 at an upper edge 404. Window 200 has a lower edge 201 which is connected slidably and pivotally to screen 400, such that screen 400 can be tilted outward by tilting the upper edge 204 of window 200 inward. Screen 400 can further be equipped to fulfil a determined function: insect screen, sun protection, blackout blind, and so on.

[0027] Figure 5 shows yet another embodiment of a window assembly wherein similar components are designated with the same reference numerals as in the embodiments discussed above. This is a window assembly as described in detail in EP 2 792 810 B1 in the name of applicant, which is included here by way of reference, but wherein a seal 300 is incorporated in the window. Seal 300 is not visible, but provided in window 200 in a manner which can be similar to the embodiments discussed above. The window assembly comprises here a screen 400 which is connected pivotally to the upper side 104 of window frame 100 at an upper edge 404. A lower edge 201 of window 200 is connected slidably and pivotally to screen 400, all this such that screen 400 can be tilted outward by tilting the upper edge 204 of window 200 inward.

[0028] The skilled person will appreciate that the invention is not limited to the above described embodiments and that many modifications and variants are possible within the scope of the invention, which is defined solely by the following claims.

Claims

1. Skylight assembly, particularly for installation in an inclining surface, comprising a window frame (100) and a window (200) which is mounted movably in the window frame, wherein the window comprises a frame (210), a first window pane (220) received in the frame and, arranged thereabove, a second window pane (230), **characterized in that,** on a side (201) of the window which is intended to form a lower side, the second window pane extends beyond the first window pane over the frame, wherein provided between the frame and the second window pane is a seal (300) which is configured to seal the space between the frame and the second window pane, even in the event of deformation of the second window pane.

2. Window assembly according to any one of the foregoing claims, **characterized in that** the seal comprises a flexible element (310) which is fastened between the frame and the second window pane.

3. Window assembly according to the foregoing claim, **characterized in that** the flexible element is adhered to the second window pane.

4. Window assembly according to the foregoing claim, **characterized in that** the flexible element is adhered to the second window pane by means of a tape (320).

5. Window assembly according to any one of the claims 2-4, **characterized in that** the flexible element is fastened to the frame, for instance by means of a tape (330).

6. Window assembly according to any one of the claims 2-5, **characterized in that** the flexible element is configured to move from a more folded or creased position to a less folded or creased position in the event of bulging of the second window pane.

7. Window assembly according to any one of the claims 2-5, **characterized in that** the flexible element is configured to be stretched elastically in the event of bulging of the second window pane.

8. Window assembly according to any one of the foregoing claims, **characterized in that** the first window pane (220) has an upper edge (224), a lower edge (221) and two side edges (222, 223), wherein a peripheral profile is provided over the upper edge and the two side edges, while the lower edge lies clear.

9. Window assembly according to any one of the foregoing claims, **characterized in that** the first window pane (220) comprises a laminated glass.

10. Window assembly according to any one of the foregoing claims, **characterized in that** the second window pane (230) comprises a pane of glass.

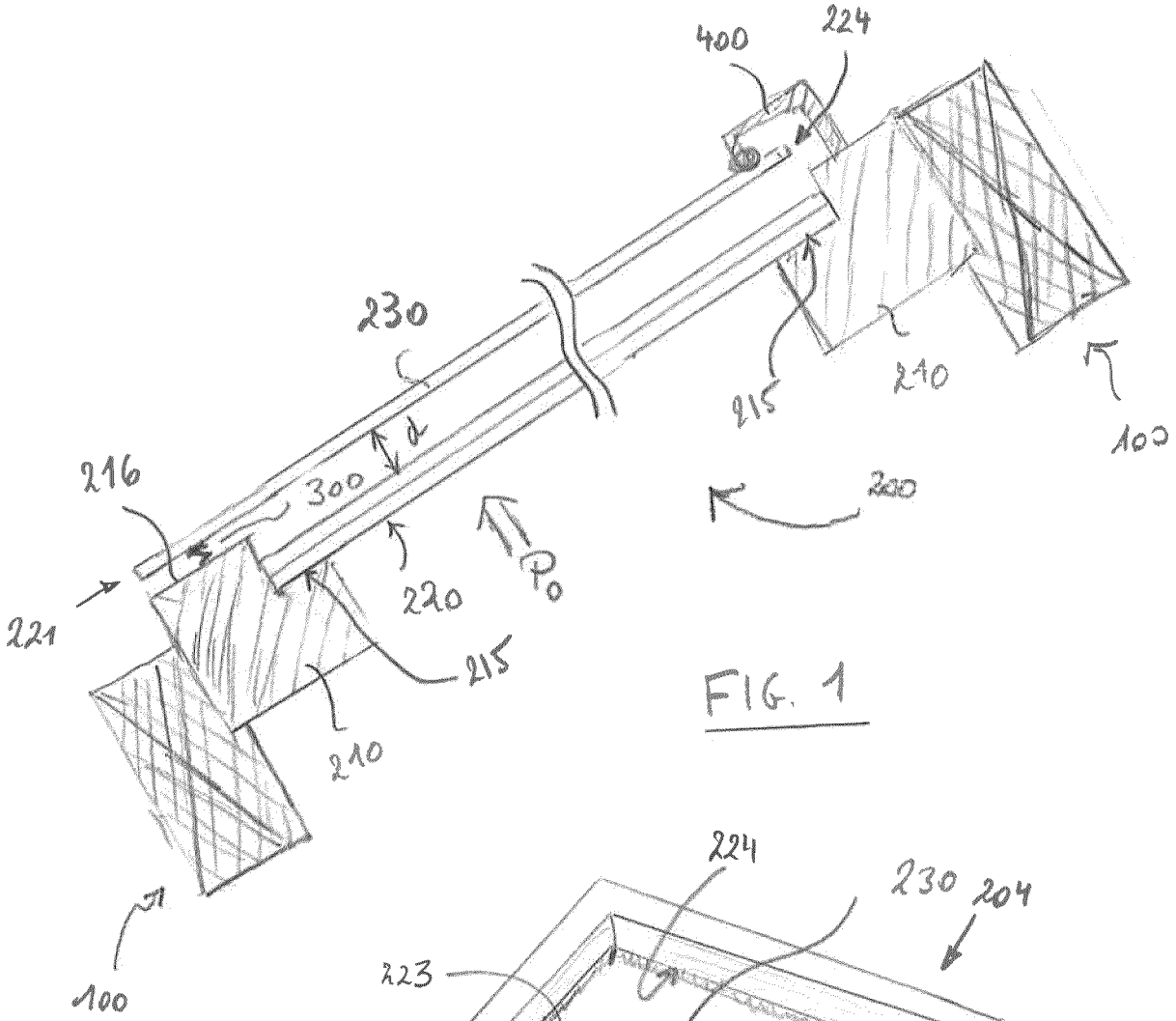
11. Window assembly according to any one of the foregoing claims, **characterized in that** the frame (210) is provided with a recess (215) on an inner periphery for the purpose of forming a support for the first win-

dow pane.

12. Window assembly according to any one of the foregoing claims, **characterized in that** the second window pane (230) is supported on the frame at a distance (d) from the first window pane (220).

13. Window assembly according to any one of the foregoing claims, **characterized in that** the window (200) is mounted pivotally in the window frame such that an upper side (204) of the window can tilt inward and preferably such that a lower side (201) of the window can tilt outward.

14. Window assembly according to the foregoing claim, further comprising a screen (400) which is connected pivotally to an upper edge (104) of the window frame (100) at an upper edge (404), **characterized in that** a lower edge (201) of the window (200) is connected slidably and pivotally to the screen, all this such that the screen can be tilted outward by tilting the upper side (204) of the window inward.


400
224
230
d
216
300
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P_0
221
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210
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200

FIG. 1

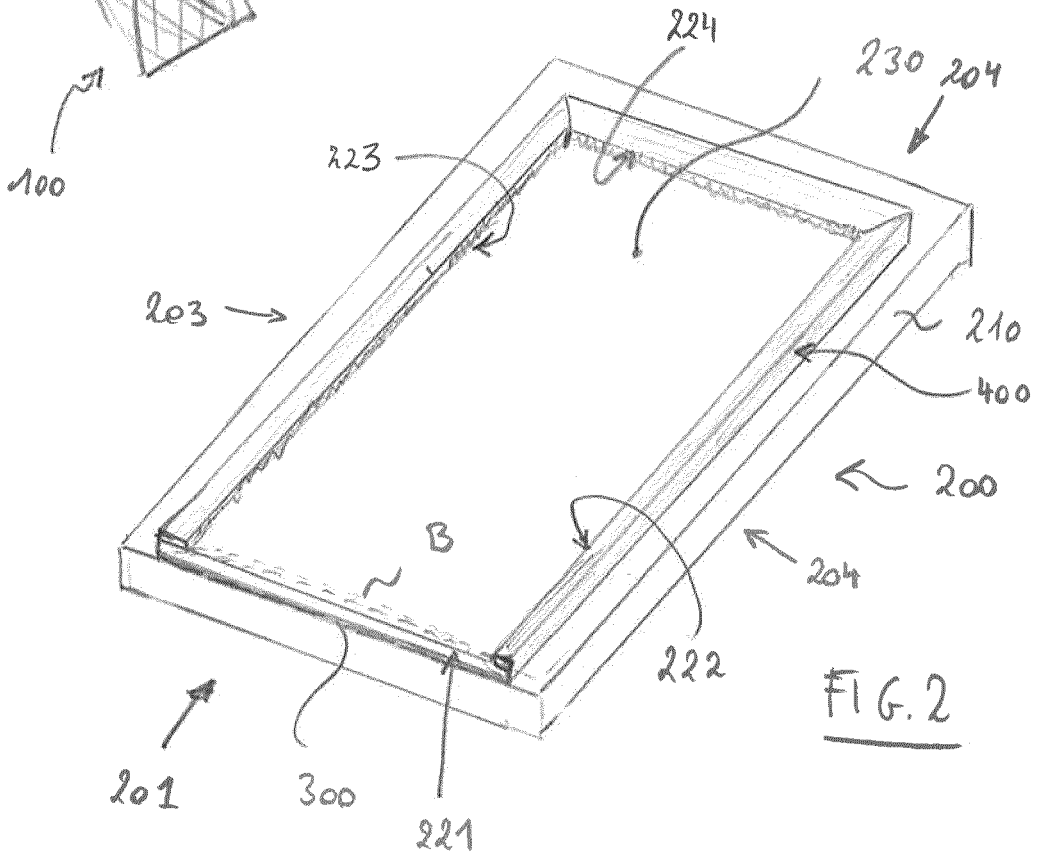
224
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FIG. 2

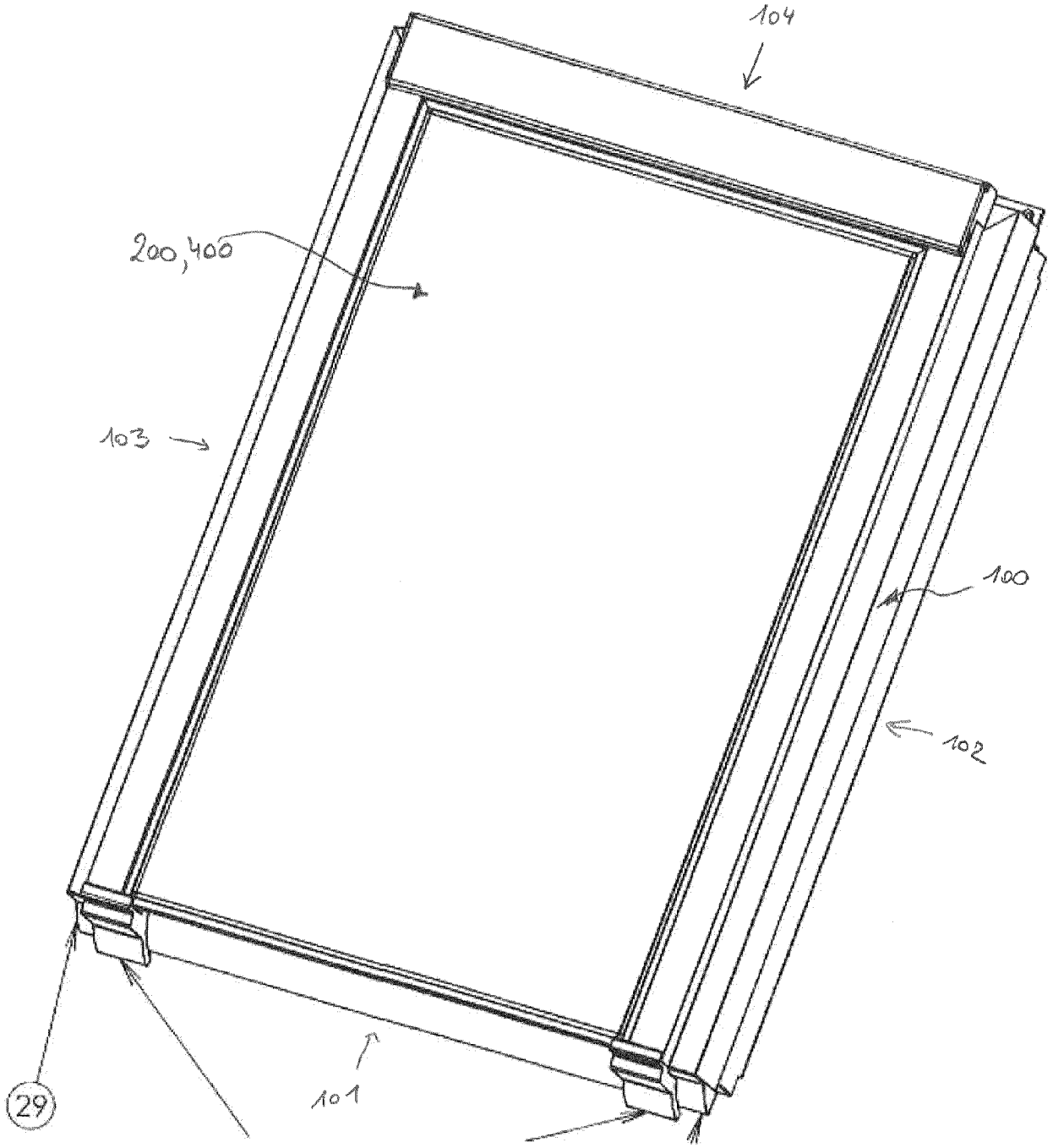
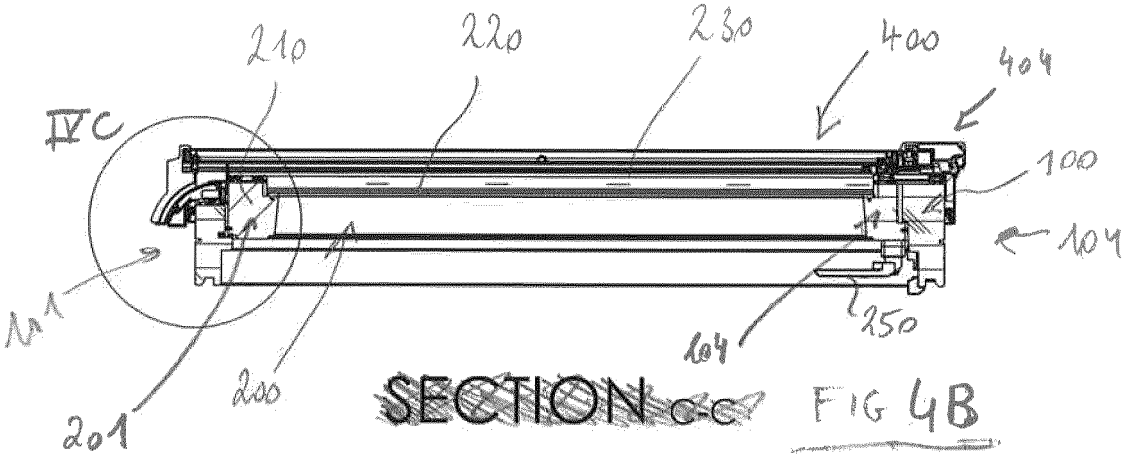


FIG. 3

+ figure without screen



SECTION C-C FIG 4B

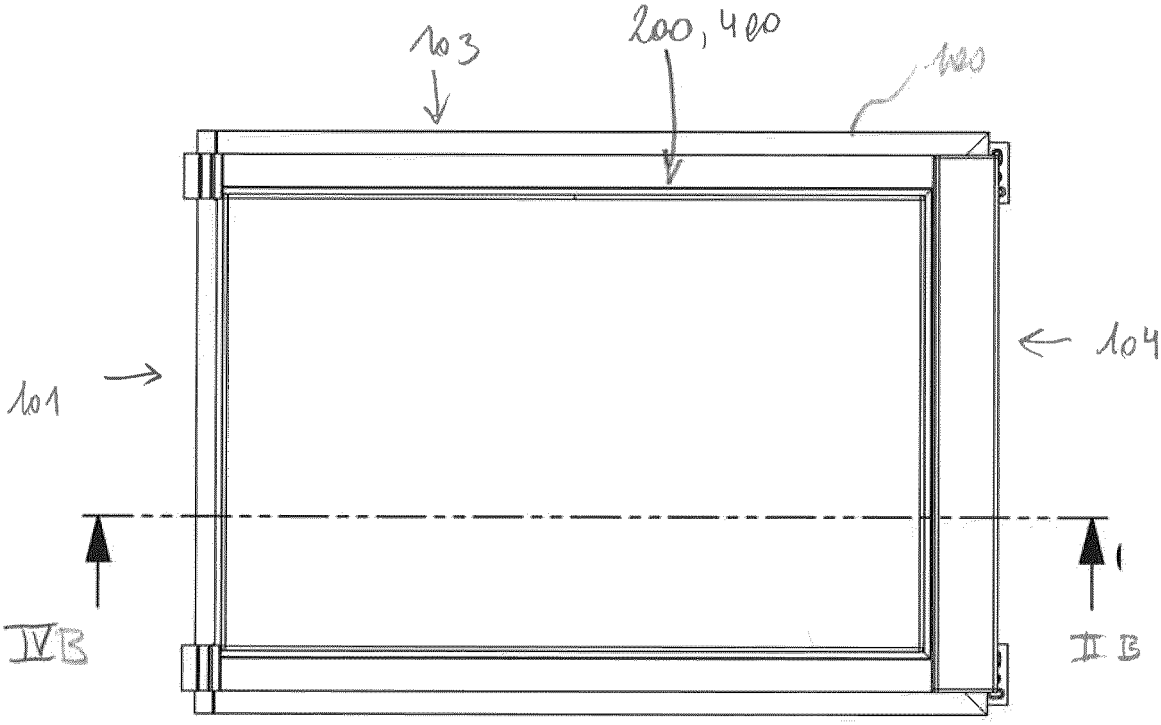


FIG. 4A

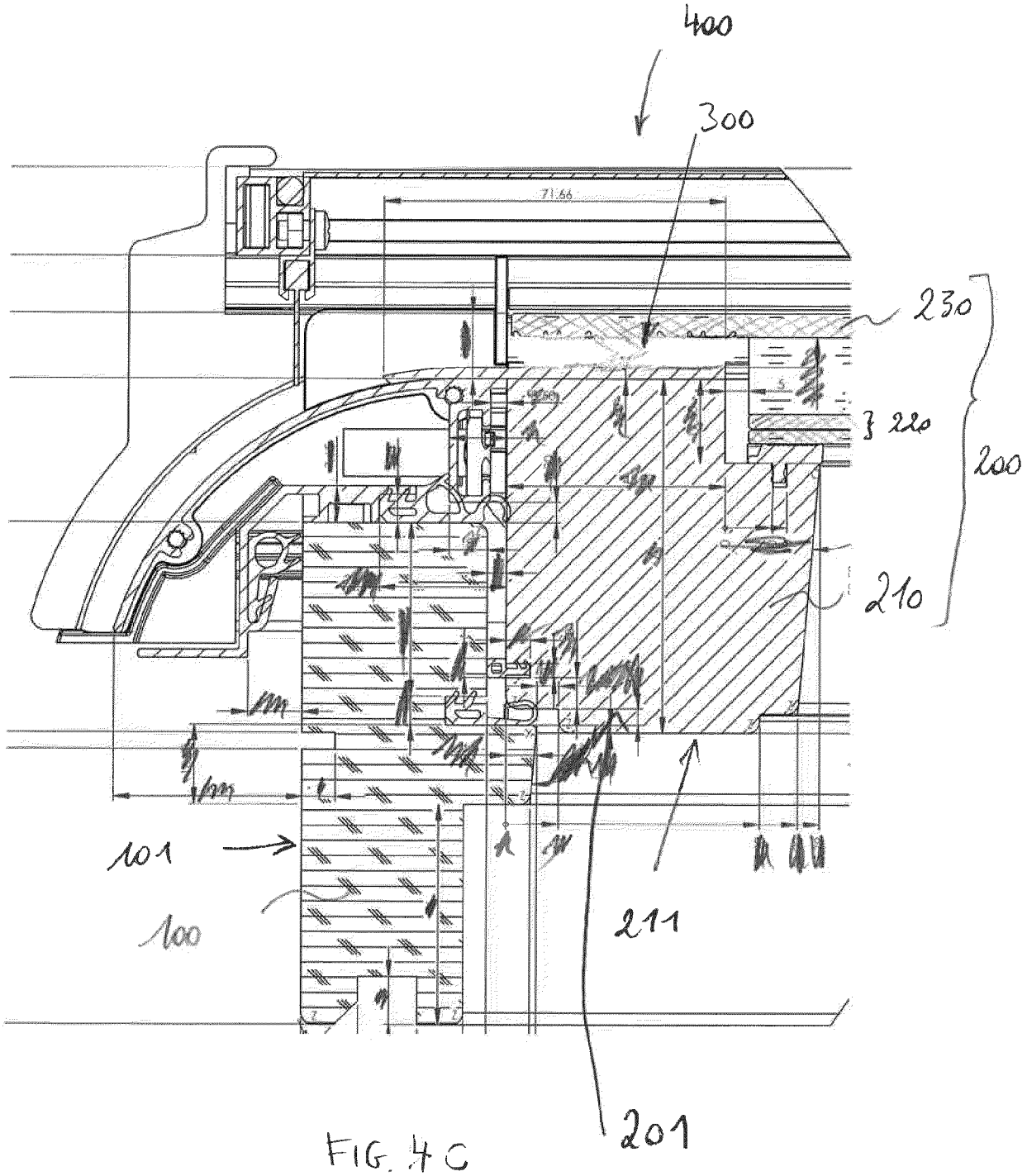
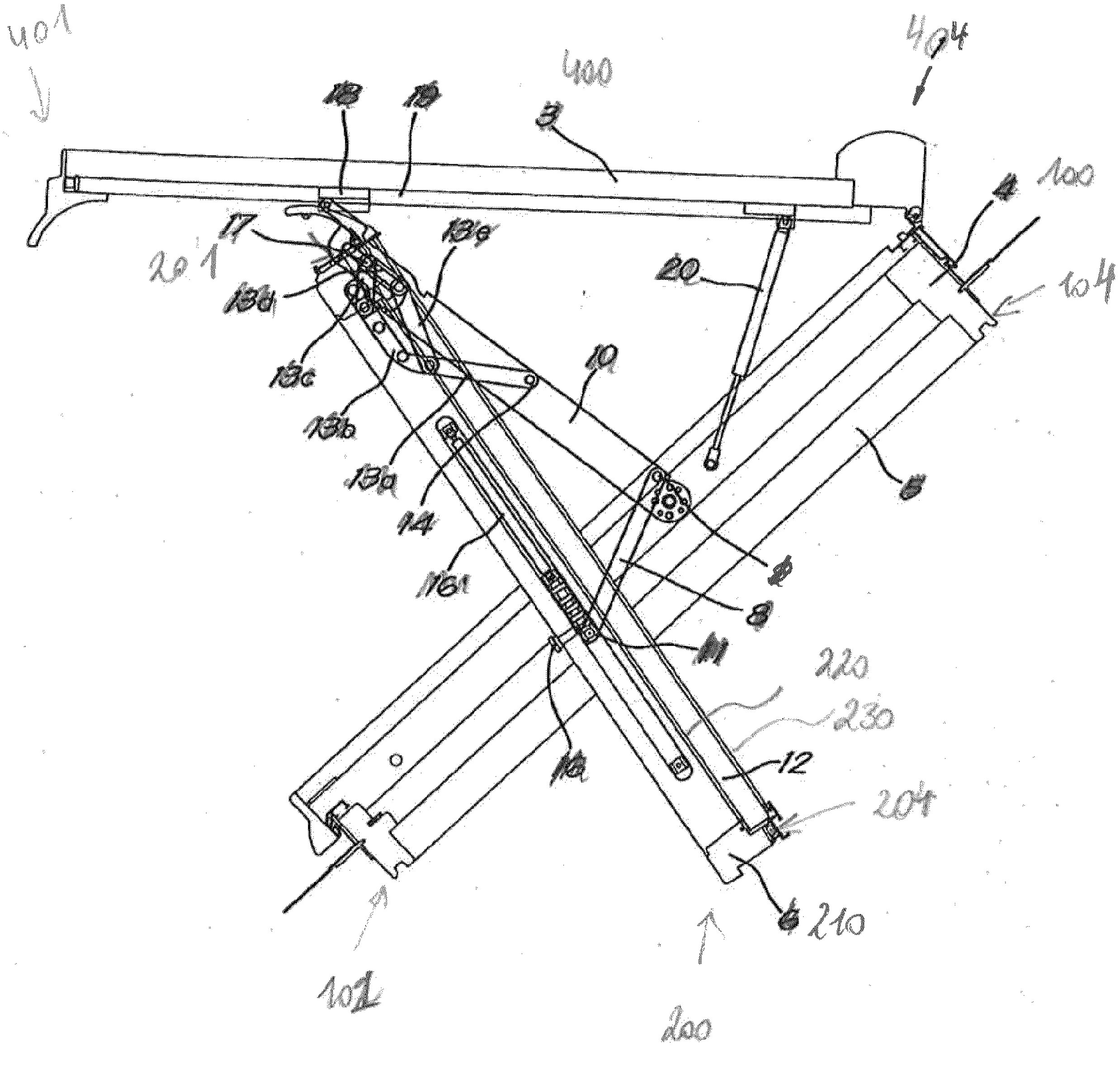


FIG. 4C


401
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204
6 210
101
200

FIG 5

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EUROPEAN SEARCH REPORT

Application Number
EP 21 15 9542

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

E04D
E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	9 June 2021	Tran, Kim Lien

CATEGORY OF CITED DOCUMENTS

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09-06-2021

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