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(54) **A ROOF WINDOW WITH A TOP SASH MODULE**

(57) The roof window (1) has a frame (2) defining a frame plane, and a sash (3) having a top member (9), a bottom member (10) and two side members (11, 12) defining a sash plane. The sash (3) has an opening for a pane (4) and an outer surface opposite said opening, the window (1) further comprising in connection with said sash top member (9) a top sash module (411) with a first side (412), a second side (415) opposite to and extending substantially parallel with said first side (411), a third side (413) and a fourth side (414) opposite to and extending substantially parallel with said third side (413), said third and fourth sides (413, 414) extending substantially perpendicular to and connecting said first and second sides (412, 415), wherein said top sash module (411) is connected to said top sash member (9) and/or said side sash members (11, 12) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3). The window is provided with at least one lock (17) for locking the frame (2) and sash (3) together.

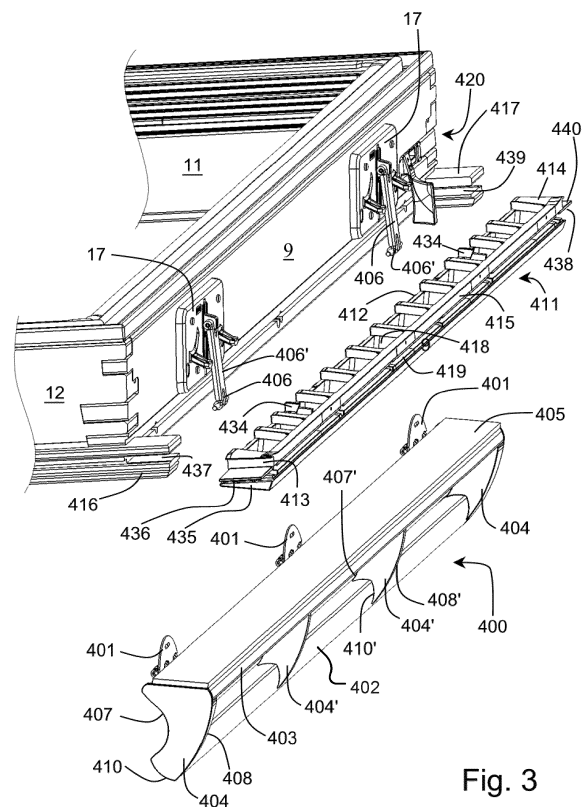


Fig. 3

Description

[0001] The present invention relates to a roof window comprising a frame with a top member, a bottom member and two side members defining a frame plane, and a sash having a top member, a bottom member and two side members defining a sash plane, the sash having an opening for a pane and an outer surface opposite said opening, the window further comprising in connection with the sash top member a top sash module with a first side, a second side opposite to and extending substantially parallel with the first side, a third side and a fourth side opposite to and extending substantially parallel with the third side, the third and fourth sides extending substantially perpendicular to and connecting the first and second sides, the top sash module comprising one or more ventilation openings adapted for providing ventilation of a building in which the window is mounted.

[0002] Roof windows of this kind are known in a number of different configurations and have proven to function very well in a number of different uses. However, in the known windows the top sash module restricts the space available for the pane of the window, and thereby restricts the amount of light entering a building in which the window is mounted.

[0003] It is therefore an object of the present invention to provide a roof window, which provides for an increased light admitting area without compromising the provision of ventilation openings.

[0004] This is achieved with a roof window of the above kind, where the top sash module is connected to the top sash member and/or the side sash members in such a way that the top sash module is arranged at the outer surface of the sash.

[0005] Thereby a roof window is provided with which the top sash module does not interfere with the space available for the pane of the window. Consequently the pane area is maximized and the amount of light entering a building in which the window is mounted is correspondingly increased.

[0006] Preferred embodiments and further advantages will be apparent from the following detailed description and the appended dependent claims.

[0007] The invention will be described in more detail below by means of a non-limiting example of an embodiment and with reference to the schematic drawing, in which

Fig. 1 shows a perspective view of a window according to the invention in the assembled state seen from below or inside,

Fig. 2 shows a perspective view of a window according to the invention in the assembled state seen from above or outside,

Fig. 3 shows an exploded view of the top of a window according to the invention featuring a top sash module according to the invention.

Figs 4 and 5 show views corresponding to Figs 1

and 2 showing a slightly different embodiment of the window according to the invention; and

Fig. 6 shows a partial perspective view of the window shown in Figs 4 and 5.

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[0008] Fig. 1 and Fig. 2 show one embodiment of a window 1 according to the invention comprising a pane 4 defining plane 16, a frame 2 having a top member 5, a bottom member 6 and two side members 7, 8 defining a frame plane, and a sash 3 having a top member 9, a bottom member 10 and two side members 11, 12 defining a sash plane. In the embodiment shown, the window is centre-hung in that the sash 3 is connected to the frame 2 by a pivot hinge (not shown) provided between side members 7, 11; 8, 12 of the frame 2 and sash 3, respectively, to be openable by tilting the sash 3 of the window 1 about the pivot hinge axis 21 defined by the pivot hinge. The pivot hinge comprises two parts, namely a sash part and a frame part.

[0009] The hinges used are preferably of the type described in the applicant's earlier patent applications WO9928581 and GB1028251, where a curved member and a tap on one hinge part travels in a curved guide track in the other during opening and closing of the window. The radius of curvature entails that when using such hinges, the hinge axis lies at a small distance above the actual hinge parts and as the sash frame is turned first the curved member and then the tap comes out of the track. In combination this provides a pattern of movement which allows easy operation of a centre-hung window and allows the sash frame to be turned substantially entirely around.

[0010] As used in this description, a closed position of the window 1 means a position in which the frame plane and the sash plane coincide, that is form an angle of 0 degrees with each other. Similarly an open position of the window 1 as used herein generally means a position in which the sash 3 is tilted about the pivot hinge axis 21 such that the frame plane and the sash plane no longer coincide.

[0011] As seen in Fig. 1 a longitudinal axis 13 of the window 1 is defined as extending perpendicular to and between the frame top member 5 and the frame bottom member 6, a transversal axis 14 of the window is defined as extending perpendicular to and between the respective frame side members 7 and 8 and thereby perpendicular to the longitudinal axis 13 and a depth axis 15 of the window 1 is defined as extending perpendicular to both the longitudinal axis 13 and the transversal axis 14. The pivot hinge axis 21 and the transversal axis 14 are parallel, and are shown as coinciding in the figures.

[0012] The window 1 furthermore comprises at least one lock 17 of a type known per se for locking the frame 2 and sash 3 together as well as a generally circumferentially extending sealing 18 provided on the sash 3 for sealing the gap between the sash 3 and the frame 2 in the closed position of the window 1. The sealing 18 comprises at least one, preferably at least two sealing strips.

[0013] Notwithstanding the centre-hung window 1 shown in Fig. 1 the window according to the invention may in other embodiments be top-hung, with or without an intermediate frame structure, have the hinge axis somewhere between the top and the centre, be side-hung or for that matter even be bottom-hung.

[0014] The sash 3 and frame 2 of the window according to the invention may be made of wooden members or members made of cast or extruded polyurethane (PUR).

[0015] Referring now to Fig. 3 the window 1 comprises in connection with the top member 9 of the sash 3 a top sash module 411 having a substantially rectangular cross section with a first side 412, a second side 415 opposite to and extending parallel with said first side 411, a third side 413 and a fourth side 414 opposite to and extending parallel with said third side 413. The third and fourth sides 413 and 414 extend substantially perpendicular to and connecting said first and second sides 412 and 415.

[0016] The first side 412 of the top sash module 411 is adapted to be attached to or abutting a surface of the top sash member 9 opposite the pane 4 of the window 1.

[0017] The side sash members 11 and 12 of the window 1 each comprise an extension 417, respectively 416, extending in the longitudinal direction 13 of the window 1 beyond the top sash member 9. The third and fourth sides 413 and 414 are connected to the extensions 416, respectively 417, of the side sash members 12, respectively 11. In this way the top sash module 411 is placed essentially outside the space defined by the sash 3, i.e. essentially outside the sash plane.

[0018] The connection between the third side 413 and the extension 416, respectively the fourth side 414 and the extension 417, may be achieved in any suitable way, such as by a friction-locking or snap-locking mechanism or even by means of an adhesive or an attachment means such as a screw or a nail.

[0019] In a preferred embodiment shown in Fig. 3, the third and fourth side 413 and 414 are each provided with an attachment member 435, respectively 438, while the extensions 416 and 417 are each provided with a corresponding receiving member 437, respectively 439. In the embodiment shown, the attachment members 435 and 438 are protrusions provided with a slot 436, respectively 440, while the receiving members 437 and 439 are corresponding slots in the extensions 416 and 417. The slots 436, 440 provide the attachment members 435 and 438 with a spring-effect such that the attachment members 435 and 438 are retained in the receiving members 437 and 439 by means of friction. Such an arrangement provides for a particularly secure and strong attachment of the top sash module 411.

[0020] In another embodiment, being particularly suitable for roof windows in which the sash 3 and the frame 2 are made of plastic, preferably of PUR, the top sash module 411 is provided as an integral or separate part of the top sash member 9 and/or of the side sash members 11 and/or 12. In this embodiment the top sash module is preferably placed substantially inside the space

defined by the sash. Furthermore, in this embodiment the top sash module 411 is preferably made of a plastic, such as PUR. In case the top sash module 411 is provided as a separate element it is preferably attached by means of a snap locking connection somewhat resembling the attachment members 435, 438 and the slots 436, 440 described above and shown in fig. 3, but where the slot is relatively wide, while the attachment members are provided as thin, flexible tongues.

[0021] As likewise shown on Fig. 3, the window 1 furthermore comprises a ventilation flap 400 in connection with the top sash member 9. The ventilation flap 400 is an elongate element, which is connected to the top sash member 9 by means of at least one pivot connection 401 such as a hinge and to the lock 17 by means of another pivot connection 406. The pivot connection 406, which may be a hinge, and the lock 17 are preferably adapted to enable the ventilation flap 400 to be placed in at least two, and preferably at least three, different positions including a closed and at least one open position. To this end the lock 17 may for instance be a spring biased locking mechanism. Although two locks 17 are shown in Fig. 3, only one lock or for that matter more than two locks may also be provided.

[0022] The ventilation flap 400 extends substantially in the total longitudinal extension of the top sash member 9. The ventilation flap 400 comprises a first profile 402, a second profile 403, two third profiles 404 and at least one fourth profile 404'.

[0023] The first profile 402 is an elongate profile extending substantially in the total longitudinal extension of the top sash member 9 and being adapted for functioning as a handle for operating the ventilation flap 400. The first profile 402 may in principle have any cross-sectional shape, although a rounded, triangular shape is preferred.

[0024] The second profile 403 is likewise an elongate profile extending substantially in the total longitudinal extension of the top sash member 9. The second profile 403 is adapted for abutment against a top sash module 411, which will be described in closer detail further below, as well as optionally against the top sash member 9. To this end the second profile 403 may comprise a layer 405 of a durable and flexible material suitable for sealing the transition between the second profile 403 on one side and the top sash member 9 and top sash module 411, respectively, on the other side. The layer 405 of flexible material may for instance be made of a suitable foam or felt and may comprise a reinforcing surface layer for added durability. The second profile 403 may in principle have any suitable cross-sectional shape, although a shape of which at least the surface comprising the layer 405 is substantially plane is preferred.

[0025] The second profile 403 furthermore comprises the pivot connection(s) 401, of which three are shown in Fig. 3 although any number may in principle be provided, connecting the ventilation flap 400 and the top sash member 9 as well as the pivot connection 406 connecting the ventilation flap to the lock 17.

[0026] The first and second profiles 402 and 403 are connected by means of the third and fourth profiles 404, 404' in such a way that they extend substantially parallel to each other and that the handle, i.e. the first profile 402, for operating the ventilation flap is displaced in relation to the second profile 403 in a direction away from the top sash member 9 and towards the pane 4 in the longitudinal direction 13 of the window 1.

[0027] More specifically, the third profiles 404 are located connecting end sections of the first and second profiles 402 and 403, while the at least one fourth profile 404' is located connecting the first and second profiles 402 and 403 at a location between the end sections for supporting purposes.

[0028] In a preferred embodiment that may be seen on Fig. 3, the third and fourth profiles 404 and 404' are curved in such a way that, when the first and second profiles 402 and 403 are connected by means of the third and fourth profiles 404 and 404', the first profile 402 is arranged staggered with respect to the second profile 403, particularly staggered in the longitudinal direction 13 of the window 1.

[0029] In further detail, the third profiles 404 each comprise a first surface 409, a second surface 410, a third surface 407 and a fourth surface 408. The first surface 409 is adapted for abutting and connection with an end section of the second profile 403, particularly the outermost 5 mm or less of the second profile 403 seen in the longitudinal direction thereof. The second surface 410 is arranged opposite said first surface 409 and is adapted for connection with an end section of the first profile 402, particularly the outermost 5 mm or less of the first profile 402 seen in the longitudinal direction thereof. The mutually opposite third and fourth surfaces 407 and 408 are connecting the first and second surfaces 409 and 410. The third and fourth surfaces 407 and 408 are both curved, the third surface 407 having a smaller radius of curvature than the fourth surface 408. In this way the general shape of the third profiles 404 may be described as similar to that of e.g. a comma.

[0030] Similarly, the fourth profiles 404' each comprise a first surface (409', but not visible on Fig. 3) adapted for connection with an intermediate section of the second profile 403, a second surface 410' opposite said first surface 409 adapted for connection with an intermediate section of the first profile 402 and mutually opposite third and fourth surfaces 407' and 408' connecting said first and second surfaces 409' and 410'. The third and fourth surfaces 407' and 408' are both curved, preferably in the same way as the third and fourth surfaces 407 and 408 of the third profiles 404, the third surface 407 having a smaller radius of curvature than the fourth surface 408.

[0031] The third and fourth profiles 404 and 404' are preferably less than 5 mm, most preferred less than 3 mm, in thickness.

[0032] Providing the ventilation flap 400, and particularly the third and fourth profiles 404 and 404', with a shape as that described in general terms above has the

effect of providing more room for the hands of a user desiring to grip and operate the handle thus facilitating gripping and operating the ventilation flap 400. A further advantage of such a displacement will become obvious from the below description of the associated top sash module 411.

[0033] The profiles 402, 403, 404 and 404' of the ventilation flap may be made of a metal, preferably aluminium, wood, plastic or polyurethane. In case of a wooden window 1, the first profile 402 is preferably made of aluminium, the second profile 403 of wood and the third and fourth profiles 404 and 404' of plastic. The profiles 402, 403, 404 and 404' are preferably assembled using an adhesive. In case of a window 1 made of extruded or cast PUR, all of the profiles are preferably likewise made of PUR, and may be cast separately or partially or fully integral.

[0034] When operating the handle, i.e. the first profile 402, the ventilation flap 400 is pivoted about the pivot connection 401 from an open position to a closed position in abutment against the top sash module 411 or vice versa. One or more intermediate positions, in which the ventilation flap 400 may be temporarily locked, may be defined between the open and closed position.

[0035] The top sash module 411 is furthermore provided with one or more ventilation openings 418. For ventilation purposes air is allowed to pass through the ventilation openings 418 when the ventilation flap 400 is in its open position, while the ventilation openings 418 are closed when the ventilation flap 400 is in its closed position abutting the top sash module 411. The amount of air passing the ventilation openings 418 may be regulated by means of the intermediate positions of the ventilation flap 400. In the closed position of the ventilation flap 400, the sash module 411 forms a sealing stop for the ventilation flap 400.

[0036] The top sash module 411 may furthermore be provided with at least one, preferably two, protrusions 434, which are arranged in connection with a ventilation opening 418. The protrusion(s) 434 is intended for acting as a guide means for an element 406' connecting the pivot connection 406 and the lock 17. Although Fig. 3 shows an embodiment of a window 1 comprising two locks 17, another preferred embodiment of a window features only one lock 17, which is preferably placed centrally on the top sash member 9, and correspondingly the top sash module 411 features only one, likewise centrally arranged, protrusion 434.

[0037] This arrangement has the advantage compared with the known solutions, that the ventilation arrangement provided by the top sash module 411 and the ventilation flap 400 in combination is positioned essentially outside the space defined by the sash members 9, 10, 11, 12. In other words, the top sash module 411 and the ventilation flap 400 are positioned in such a way as to enable the area available for the pane 4 to be increased, which in turn allows for a larger amount of light to be transmitted through the window into a building in which

it is installed. Particularly, measurements have shown that this arrangement may increase the pane area by 8 to 9 %, particularly about 8 %. Another advantage provided with this arrangement lies in that the top casing 500 may be made smaller, which in turn saves material and thus provides for a window 1 which is cheaper to manufacture.

[0038] Preferably, the top sash module 411 is made of a plastic, such as PUR, and it may be cast or extruded. This has the further advantage of improved insulation characteristics compared with existing solutions. Preferably, the thickness of the top sash module 411 is between 1 and 2 centimetres. For windows 1 with a sash 3 and a frame 2 made of polyurethane, the top sash module 411 may be cast in one piece with the sash 3, but it may also be cast as a separate module such as that described above.

[0039] Furthermore, the top sash module 411 may be adapted to function as a holder for receiving a gasket or sealing strip for sealing the gap between the top sash module 411 and the top frame member 5 in the closed position of the window 1. To this end the second side 415 of the top sash module may be provided with receiving means, such as a recess or groove 419 extending substantially in the total longitudinal extension of the top sash module 411 as shown on Fig. 3.

[0040] Preferably, the recess 419 is arranged such as to be flush with a corresponding recess or groove in the respective adjacent extensions 416 and 417 of the side sash members 11 and 12 in the mounted position of the top sash module 411, such as to enable providing the window 1 with a preferably circumferentially extending sealing 18 for sealing the gap between the sash 3 and the frame 2 in the closed position of the window 1.

[0041] The top sash module is normally intended to be provided in a length corresponding to the width of the window in question. It is also conceivable to provide the respective end parts of the top sash module as standard units for all window sizes in a range. The top sash module is then made to fit the particular window width in question by connecting an intermediate section of appropriate length with a standard unit end part at either end. In this manner, the need for stock-keeping of various sizes is reduced. The connection between the intermediate section and the standard unit end parts may be carried out in any suitable manner, for instance by moulding.

[0042] In alternative embodiments the top sash module 411 may alternatively be attached to the top frame member 5 or the sealing strips may be omitted.

[0043] Referring now to Figs 4 to 7 showing a slightly different embodiment, the window furthermore comprises at least one barrel bolt 420 described in further detail in Applicant's co-pending European patent application having the same filing date as the present application. Here, an aperture 711 intended for receiving a bolt of the barrel bolt 422 is shown at the bottom of the frame side member 7. This aperture 711 is intended for receiving the barrel bolt in the cleaning position, i.e. when the sash

has been turned past its normal opening angle. Another aperture 712 is positioned near the top of the frame side member 7. If desirable, this aperture 712 makes it possible to provide a further ventilating position at a relatively small angle, but still allows for more air entrance than by the ventilation flap 400 in itself.

[0044] It should be noted that the above description of preferred embodiments serves only as an example, and that a person skilled in the art will know that numerous variations are possible without deviating from the scope of the claims.

[0045] The following is an itemized list of embodiments:

Embodiment 1. A roof window (1) comprising a frame (2) with a top member (5), a bottom member (6) and two side members (7, 8) defining a frame plane, and a sash (3) having a top member (9), a bottom member (10) and two side members (11, 12) defining a sash plane, the sash (3) having an opening for a pane (4) and an outer surface opposite said opening, the window (1) further comprising in connection with said sash top member (9) a top sash module (411) with a first side (412), a second side (415) opposite to and extending substantially parallel with said first side (412), a third side (413) and a fourth side (414) opposite to and extending substantially parallel with said third side (413), said third and fourth sides (413, 414) extending substantially perpendicular to and connecting said first and second sides (412, 415) the top sash module (411) comprising one or more ventilation openings (418) adapted for providing ventilation of a building in which the roof window is mounted, wherein said top sash module (411) is connected to said top sash member (9) and/or said side sash members (11, 12) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3).

Embodiment 2. A roof window according to embodiment 1, wherein said side sash members (11, 12) each comprises an extension (417, 416), extending in a longitudinal direction (13) of the window (1) at least partially beyond the top sash member (9), said third and fourth sides (413, 414) of said top sash module (411) being connected to said extensions (416, 417) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3).

Embodiment 3. A roof window according to embodiment 1 or 2, wherein that said top sash module (411) furthermore comprises at least one, preferably at least two, protrusions (434) being arranged in connection with a ventilation opening (418).

Embodiment 4. A roof window according to any one of the preceding Embodiments, wherein said top sash module (411) is made of plastic, preferably polyurethane.

Embodiment 5. A roof window according to any one of the preceding Embodiments, wherein the thick-

ness of said top sash module (411) is between 1 and 2 cm.

Embodiment 6. A roof window according to any one of the preceding Embodiments, wherein said top sash module (411) comprises receiving means (419) such as to be adapted to function as a holder for receiving a gasket or sealing strip for sealing the gap between the top sash module (411) and the top frame member (5) in the closed position of the window (1).

Embodiment 7. A roof window according to any one of Embodiments 2-6, wherein said third side (413) and said extension (416), respectively said fourth side (414) and said extension (417), are connected by means of a friction-locking mechanism, a snap-locking mechanism, an adhesive or an attachment means, e.g. a screw or a nail or the like, or combinations thereof.

Embodiment 8. A roof window according to any one of the preceding Embodiments, wherein the third and fourth side (413, 414) are each provided with an attachment member (435, 438), preferably being protrusions provided with a slot (436, 440), while the extensions (416, 417) are each provided with a corresponding receiving member (437, 439) preferably being corresponding slots.

Embodiment 9. A roof window according to any one of the preceding Embodiments, wherein the sash (3) and a frame (2) of said window (1) are made of plastic, preferably polyurethane, and that said top sash module (411) is cast or moulded in one piece with the sash (3), or is cast or moulded as a separate module.

Embodiment 10. A roof window according to any one of the preceding Embodiments, wherein the respective end parts of the top sash module are provided as standard units, and wherein the top sash module is made to fit a particular window width by connecting an intermediate section of appropriate length with a standard unit end part at either end.

Embodiment 11. A roof window (1) comprising a frame (2) with a top member (5), a bottom member (6) and two side members (7, 8) defining a frame plane, and a sash (3) having a top member (9), a bottom member (10) and two side members (11, 12) defining a sash plane, the sash (3) having an opening for a pane (4) and an outer surface opposite said opening, the window (1) further comprising in connection with said sash top member (9) a top sash module (411) with a first side (412), a second side (415) opposite to and extending substantially parallel with said first side (411), a third side (413) and a fourth side (414) opposite to and extending substantially parallel with said third side (413), said third and fourth sides (413, 414) extending substantially perpendicular to and connecting said first and second sides (412, 415) the top sash module (411) comprising one or more ventilation openings (418) adapted for providing ventilation of a building in which the roof

window is mounted, wherein

said top sash module (411) is connected to said top sash member (9) and/or said side sash members (11, 12) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3),

and wherein the window is provided with at least one lock (17) for locking the frame (2) and sash (3) together.

12. A roof window according to Embodiment 11, wherein the lock (17) is operated by a handle (402).

13. A roof window according to Embodiment 12, wherein the handle (402) is a profile forming part of a ventilation flap (400).

14. A roof window according to Embodiment 13, wherein the ventilation flap (400) is an elongate element, which is connected to the lock (17) is connected to the top sash member (9) by means of at least one pivot connection (401) and to the lock (17) by means of another pivot connection (406).

15. A roof window according to Embodiment 14, wherein the top sash module (411) is provided with guide means in the form of at least one protrusion (434) for an element (406') connecting the pivot connection (406) and the lock (17).

16. A roof window according to Embodiment 11 and 15, wherein said side sash members (11, 12) each comprises an extension (417, 416), extending in a longitudinal direction (13) of the window (1) at least partially beyond the top sash member (9), said third and fourth sides (413, 414) of said top sash module (411) being connected to said extensions (416, 417) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3).

17. A roof window according to Embodiment 16, wherein that said top sash module (411) furthermore comprises said at least one protrusion (434) arranged in connection with said one or more ventilation openings (418).

18. A roof window according to Embodiment 16, wherein said top sash module (411) is made of plastic, preferably polyurethane.

19. A roof window according to Embodiment 16, wherein the thickness of said top sash module (411) is between 1 and 2 cm.

20. A roof window according to Embodiment 16, wherein said top sash module (411) comprises receiving means (419) such as to be adapted to function as a holder for receiving a gasket or sealing strip for sealing the gap between the top sash module (411) and the top frame member (5) in the closed position of the window (1).

21. A roof window according to Embodiment 16, wherein said third side (413) and said extension (416), respectively said fourth side (414) and said extension (417), are connected by means of a fric-

tion-locking mechanism, a snap-locking mechanism, an adhesive or an attachment means, e.g. a screw or a nail or the like, or combinations thereof.

22. A roof window according to Embodiment 16, wherein the third and fourth side (413, 414) are each provided with an attachment member (435, 438), preferably being protrusions provided with a slot (436, 440), while the extensions (416, 417) are each provided with a corresponding receiving member (437, 439) preferably being corresponding slots.

23. A roof window according to Embodiment 16, wherein the sash (3) and a frame (2) of said window (1) are made of plastic, preferably polyurethane, and that said top sash module (411) is cast or moulded in one piece with the sash (3), or is cast or moulded as a separate module.

24. A roof window according to Embodiment 16, wherein the respective end parts of the top sash module are provided as standard units, and wherein the top sash module is made to fit a particular window width by connecting an intermediate section of appropriate length with a standard unit end part at either end.

Claims

1. A roof window (1) comprising a frame (2) with a top member (5), a bottom member (6) and two side members (7, 8) defining a frame plane, and a sash (3) having a top member (9), a bottom member (10) and two side members (11, 12) defining a sash plane, the sash (3) having an opening for a pane (4) and an outer surface opposite said opening, the window (1) further comprising in connection with said sash top member (9) a top sash module (411) with a first side (412), a second side (415) opposite to and extending substantially parallel with said first side (412), a third side (413) and a fourth side (414) opposite to and extending substantially parallel with said third side (413), said third and fourth sides (413, 414) extending substantially perpendicular to and connecting said first and second sides (412, 415) the top sash module (411) comprising one or more ventilation openings (418) adapted for providing ventilation of a building in which the roof window is mounted, wherein said top sash module (411) is connected to said top sash member (9) and/or said side sash members (11, 12) in such a way that said top sash module (411) is arranged at the outer surface of said sash (3).
2. A roof window according to claim 1, wherein the window (1) furthermore comprises a ventilation flap (400) in connection with the top sash member (9).
3. A roof window according to claim 2, wherein the ventilation flap (400) comprises a first profile (402) being an elongate profile extending substantially in the total longitudinal extension of the top sash member (9) and being adapted for functioning as a handle for operating the ventilation flap. (400).
4. A roof window according to claim 2 or 3, wherein the ventilation flap (400) comprises a second profile (403) which extends substantially in the total longitudinal extension of the top sash member (9) and comprises a layer (405) of a durable and flexible material suitable for sealing the transition between the second profile (403) on one side and the top sash member (9) and the top sash module (411), respectively, on the other side.
5. A roof window according to claims 3 and 4, wherein the first and second profiles (402, 403) are connected by means of third and fourth profiles (404, 404') in such a way that they extend substantially parallel to each other and such that the handle for operating the ventilation flap is displaced in relation to the second profile (403) in a direction away from the top sash member (9) and towards the pane (4) in a longitudinal direction (13) of the window (1).
6. A roof window according to any one of claims 4 to 5, wherein the second profile (403) comprises pivot connection(s) (401) connecting the ventilation flap (400) and the top sash member (9) as well as a pivot connection (406) connecting the ventilation flap (400) to a lock (17).
7. A roof window according to claim 1, wherein the window is provided with at least one lock (17) for locking the frame (2) and sash (3) together, and the ventilation flap (400) is an elongate element, which is connected to the top sash member (9) by means of at least one pivot connection (401) such as a hinge and to the lock (17) by means of another pivot connection (406), and wherein the top sash module (411) is provided with at least one, preferably two, protrusions (434), which are arranged in connection with the one or more ventilation openings (418), the protrusion(s) (434) acting as a guide means for an element (406') connecting the pivot connection (406) and the lock (17).
8. A roof window according to any one of the preceding claims, wherein the top sash module (411) is adapted to function as a holder for receiving a gasket or sealing strip for sealing the gap between the top sash module (411) and the top frame member (5) in the closed position of the window (1).
9. A roof window according to any one of the preceding claims, wherein the second side (415) of the top sash

module is provided with receiving means, such as a recess or groove (419) extending substantially in the total longitudinal extension of the top sash module (411).

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- 10. A roof window according to claim 9, wherein the recess (419) is arranged such as to be flush with a corresponding recess or groove in respective adjacent extensions (416, 417) of the side sash members (11, 12) in the mounted position of the top sash module (411), such as to enable providing the window (1) with a preferably circumferentially extending sealing (18) for sealing the gap between the sash (3) and the frame (2) in the closed position of the window (1).

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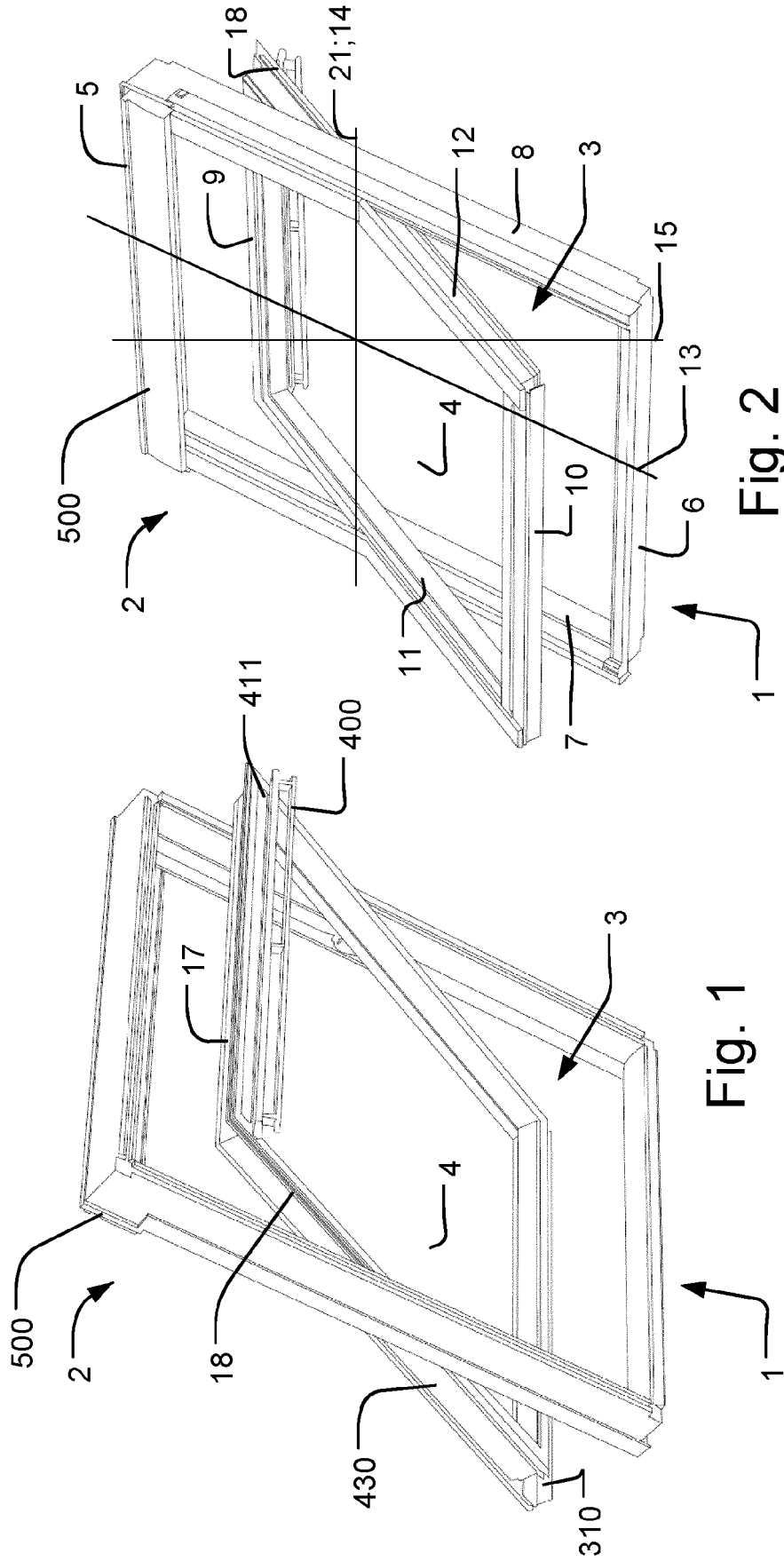
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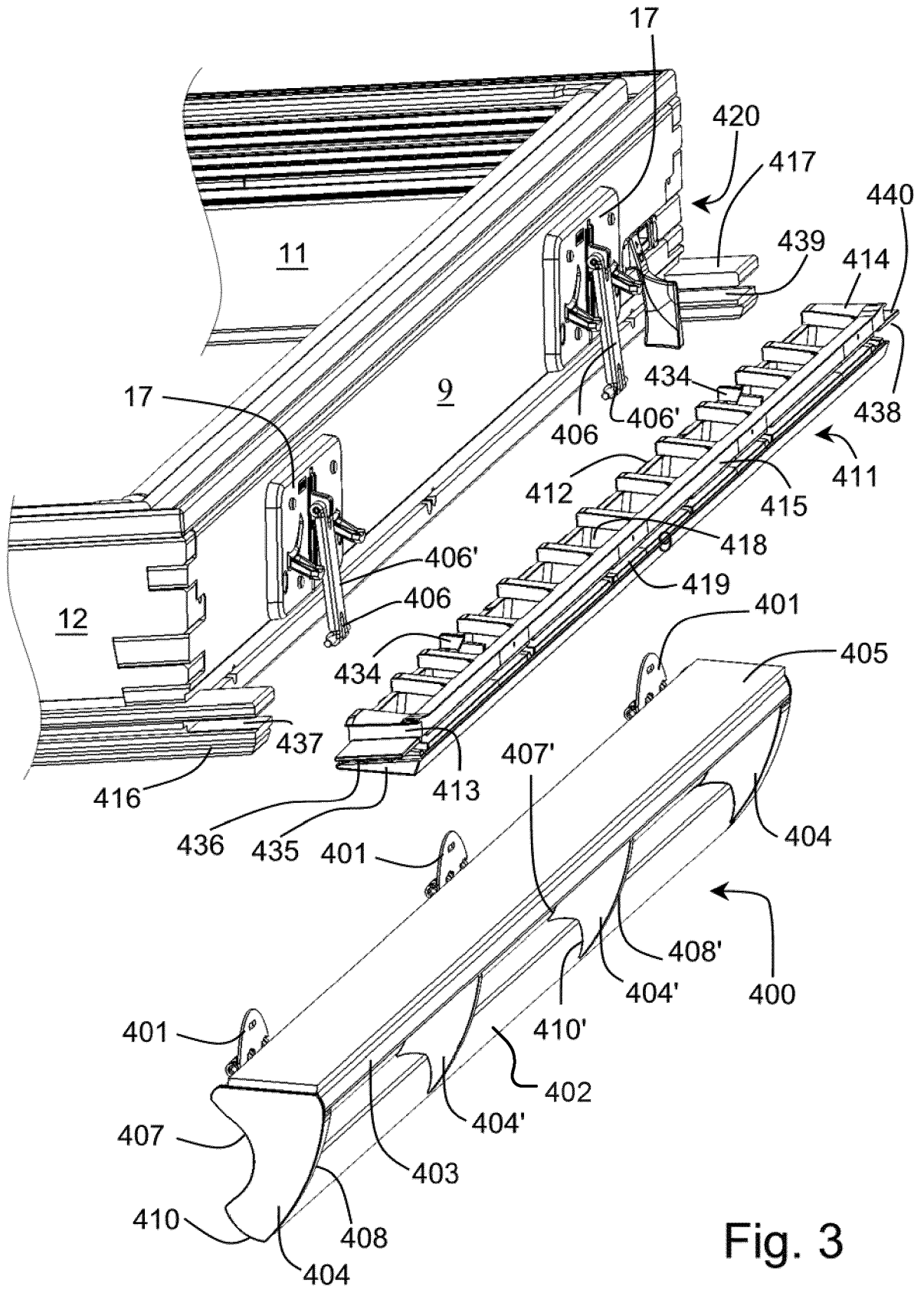


Fig. 3

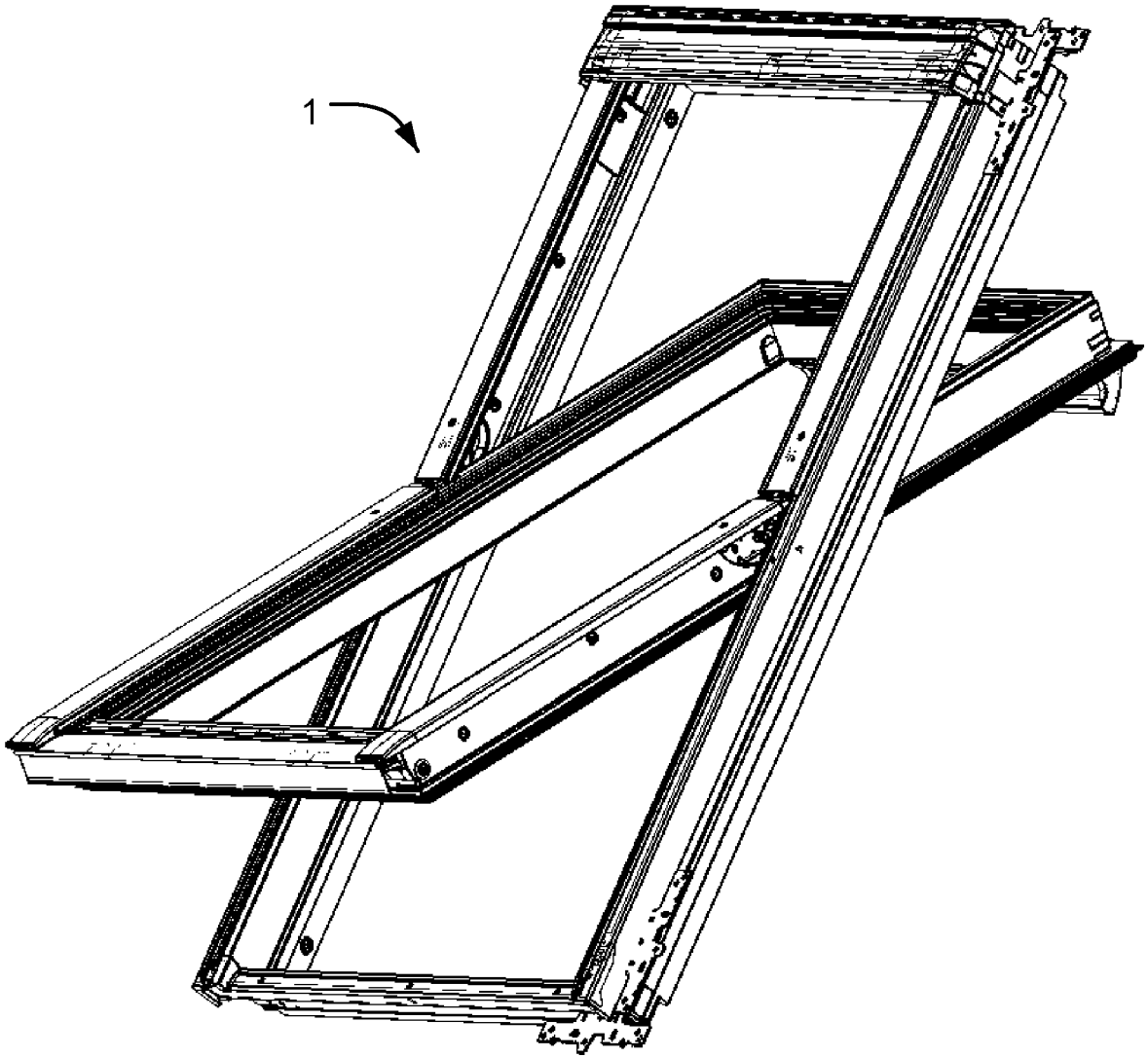


Fig. 4

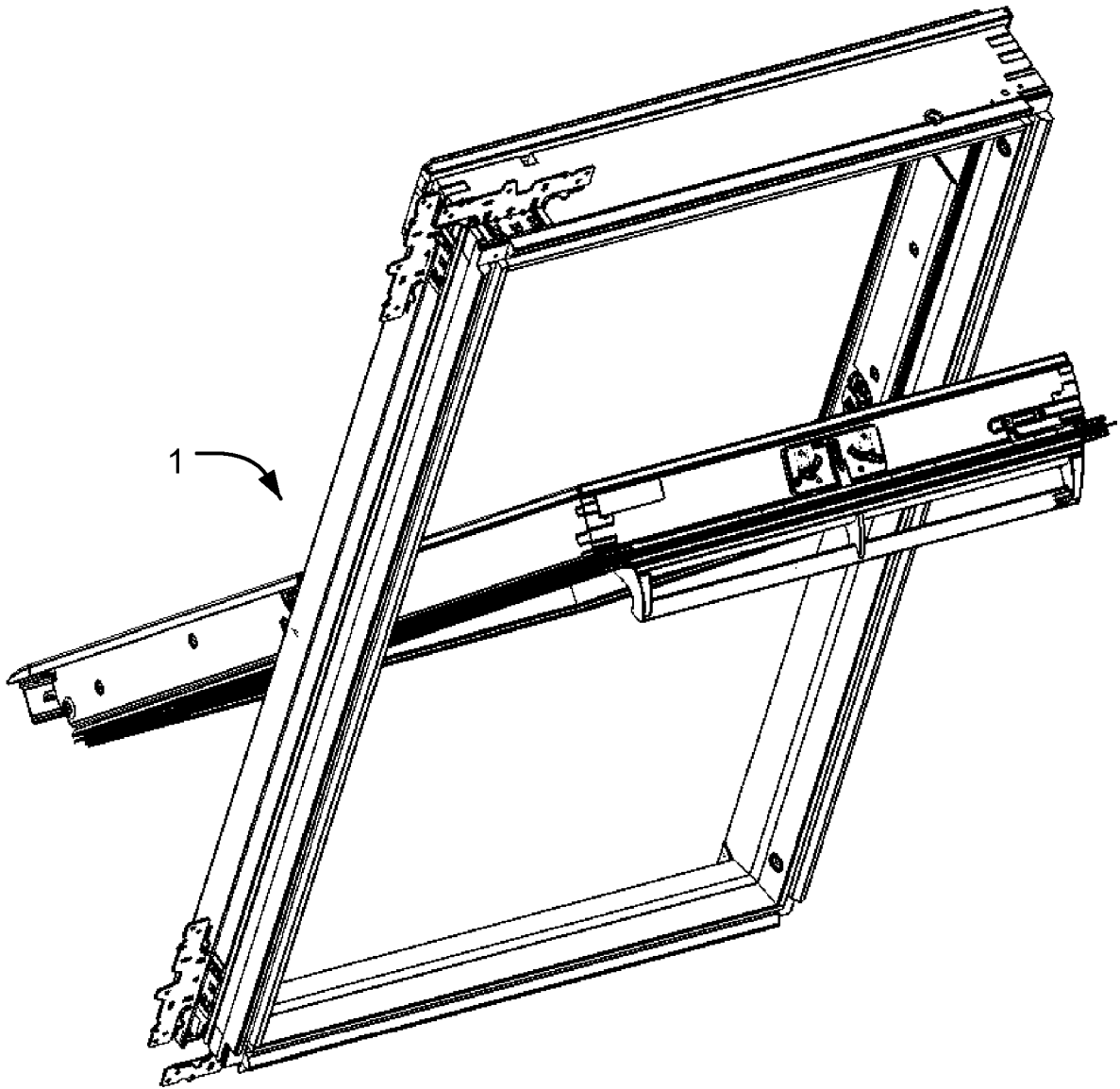


Fig. 5

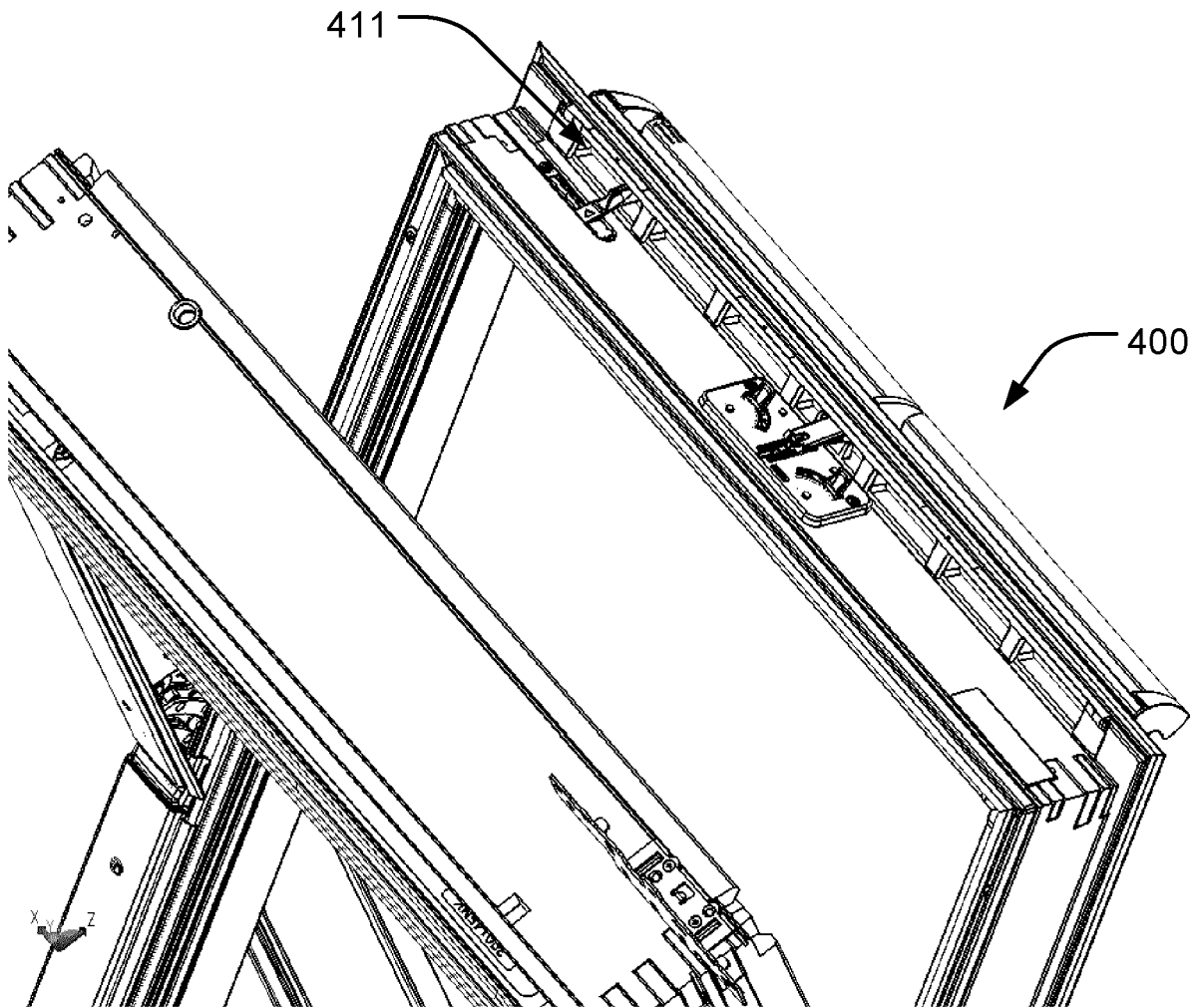


Fig. 6



EUROPEAN SEARCH REPORT

Application Number

EP 23 16 1705

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DOCUMENTS CONSIDERED TO BE RELEVANT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
E	EP 2 565 355 A2 (VKR HOLDING AS [DK]) 6 March 2013 (2013-03-06) * figures 2, 5, 7a, 7b, 8 * * paragraph [0014] * -----	1-3, 8-10	INV. E04D13/035 E06B7/10 F24F13/18 E04D13/03
X	WO 2007/028590 A2 (VKR HOLDING AS [DK]; TORBEN ALLESEN PEDERSEN [DK]) 15 March 2007 (2007-03-15) * figures 1, 11-16 * -----	1-3, 8-10	
A	WO 03/001017 A1 (VKR HOLDING AS [DK]; JAKOBSEN PEDER DINESS [DK]) 3 January 2003 (2003-01-03) * figures 1, 2 * -----	4-7	
A	WO 99/51832 A1 (VELUX IND AS [DK]; FRANSSON JAN [DK] ET AL.) 14 October 1999 (1999-10-14) * figures 2, 3 * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E06B F24F

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The present search report has been drawn up for all claims

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Place of search The Hague	Date of completion of the search 22 June 2023	Examiner Tryfonas, N
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ON EUROPEAN PATENT APPLICATION NO.

EP 23 16 1705

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The members are as contained in the European Patent Office EDP file on
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22-06-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2565355	A2	06-03-2013	NONE

WO 2007028590	A2	15-03-2007	CN 101305148 A
			EA 200800749 A1
			EP 1922465 A2
			JP 5114407 B2
			JP 2009520134 A
			US 2008309099 A1
			WO 2007028590 A2

WO 03001017	A1	03-01-2003	AT 403058 T
			CN 1507527 A
			CZ 303633 B6
			DK 1404940 T3
			EA 200400062 A1
			EP 1404940 A1
			EP 2034121 A2
			HU 0400126 A2
			PL 366562 A1
			WO 03001017 A1

WO 9951832	A1	14-10-1999	AT 241063 T
			AU 2827699 A
			DE 69908116 T2
			EP 1070181 A1
			HU 0100984 A2
			PL 343362 A1
			WO 9951832 A1

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 9928581 A [0009]
- GB 1028251 A [0009]