



HU000028282T2

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Szellemi Tulajdon Nemzeti Hivatala(11) Lajstromszám: **E 028 282**(13) **T2****EURÓPAI SZABADALOM**
SZÖVEGÉNEK FORDÍTÁSA(21) Magyar ügyszám: **E 12 772213**(22) A bejelentés napja: **2012. 10. 04.**

(96) Az európai bejelentés bejelentési száma:

EP 20120772213

(97) Az európai bejelentés közzétételi adatai:

EP 2748391 A1 **2013. 04. 11.**

(97) Az európai szabadalom megadásának meghirdetési adatai:

EP 2748391 B1 **2016. 03. 16.**(51) Int. Cl.: **E04D 130/35** (2006.01)

(86) A nemzetközi (PCT) bejelentési szám:

PCT/DK 12/050374

(87) A nemzetközi közzétételi szám:

WO 13050042

(30) Elsőbbségi adatok:

201170556**2011. 10. 04.****DK**

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Keret ablakhoz és eljárás keret előállítására

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

(19)



(11)

EP 2 748 391 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
16.03.2016 Bulletin 2016/11

(21) Application number: **12772213.0**

(22) Date of filing: **04.10.2012**

(51) Int Cl.:
E04D 13/035 (2006.01)

(86) International application number:
PCT/DK2012/050374

(87) International publication number:
WO 2013/050042 (11.04.2013 Gazette 2013/15)

(54) **A FRAME FOR A WINDOW AND A METHOD FOR MAKING A FRAME**

FENSTERRAHMEN UND VERFAHREN ZUR HERSTELLUNG EINES SOLCHEN RAHMENS

CADRE DE FENÊTRE ET PROCÉDÉ DE FABRICATION D'UN CADRE

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **04.10.2011 DK 201170556**

(43) Date of publication of application:
02.07.2014 Bulletin 2014/27

(60) Divisional application:
15193185.4

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Description

[0001] The present invention relates to a centre-hung pivot window comprising a stationary frame and a sash frame, said frames comprising a top member, a bottom member and two side members, each having a side surface intended to face a corresponding side surface of the other frame of the window. It further relates to a method of making such a centre-hung pivot window.

[0002] In this, whenever the term "frame" is used it is to be understood as including both sash frames carrying panes and stationary frames carrying sash frames. The terms "sash frame" and "stationary frame" are used when reference is made specifically to frames intended for one of these two purposes.

[0003] Frames for windows are traditionally made from wooden members, from moulded polyurethane members with a wooden core for reinforcement or from extruded members of aluminium or polyvinylchloride. Different components such as hinges, locking assemblies and gaskets are added to provide the needed functionality and when using extruded profiles, insulation material may be provided in hollows in the profile.

[0004] NL7412704A discloses a centre-hung pivot window according to the preamble of claim 1.

[0005] With these ways of making a frame, a limit on the thermal properties seems to have been reached, but the demand for still more energy efficient windows keeps rising.

[0006] It is therefore the object of the present invention to provide an alternative window and a method for making such a window having even better thermal properties.

[0007] This is achieved with a centre-hung pivot window according to claim 1.

[0008] Abutment lists are used where the sash frame comes into contact with the stationary frame during opening and closing of the window and closes the gap between the sash frame and the stationary frame formed to make room for hinges. For a centre-hung pivot window abutment lists are usually found at the lowermost half of the side members of the stationary frame and at the uppermost half of the side members of the sash frame. The abutment lists have hitherto been integrated in the frame member or made from the same material as a main body of the frame member, but now contributes to the insulation of the window.

[0009] It is noted that the term pivot hinge is intended to cover hinges of the type originally described in DK70390 and the term pivot window to cover windows with this type of hinges, i.e. windows where the hinges are located between the side members of the sash frame and the stationary frame and where the axis of rotation is located at a distance from the plane of the frames.

[0010] The desired thermal conductivity is achieved with polystyrene. Expanded polystyrene (EPS) or extruded polystyrene (XPS) is particularly well-suited since these materials are well tested, relatively cheap, non-toxic and durable.

[0011] The insulating abutment lists preferably cover the side surfaces of the parts of the side members extending from a hinge axis to the bottom or top member substantially entirely. This continuity provides for an uninterrupted surface, which makes it durable and easy to keep clean, but it is also possible to use discrete blocks of material. A continuous embodiment, however, allows the insulating abutment list to contribute to the tightening of the window and gives better insulating properties. Moreover, an abutment list on the stationary frame will also be visible from the inside, when the window is open, and a continuous surface is perceived as visually more appealing by most users.

[0012] The best possible continuity of the insulating abutment list is achieved when recesses are formed at the ends nearest to the hinge parts in the mounted state, said recesses conforming in shape to the shape of the hinge parts.

[0013] To improve the insulating properties the insulating abutment list covers at least a part of the exterior side of the frame member, i.e. the side intended to face the exterior of a building in the mounted state of the window.

[0014] Likewise it is noted that the frame member carrying the insulating abutment list may itself include insulating material, which may for example be provided in the interior of the frame member, and that the window may be arranged in one or more insulating frames during mounting in a load-bearing structure, such as a roof.

[0015] Insulating abutment lists may be attached to the main bodies of the frame members in any appropriate way including the use of screws, glue and/or an adhesive. The attachment must of course be sufficient to keep the insulating abutment list in place during use of the window, but it may be detachable to allow replacement of the insulating abutment list.

[0016] The invention will be explained in more detail below by means of non-limiting examples 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 the interior,

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

Fig. 3 shows a side sash frame member in a perspective view,

Fig. 4 shows a stationary side frame member in a perspective view,

Fig. 5 shows a sketch of a cross-section along the line V-V in Fig. 1 in the closed and mounted state of the window,

Fig. 6 shows a perspective view of the bottom member of the stationary frame with insulation, strike plate and covering,

Fig. 7 shows a cross-section along the line VII-VII in Fig. 6, and

Figs 8 and 9 correspond to Figs 1 and 2 showing a roof window according to the invention in from two different angles.

[0017] Figs 1 and 2 show a preferred embodiment of a window 1 according to the invention comprising a pane 4, a stationary frame 2 having a top member 5, a bottom member 6 and two side members 7, 8 defining a stationary frame plane, and a sash frame 3 having a top member 9, a bottom member 10 and two side members 11, 12 defining a sash frame plane. In the embodiment shown, the window is centre-hung in that the sash frame 3 is connected to the stationary frame 2 by a pivot hinge 19, 20 (see Figs 3 and 4) provided between side members 7, 11; 8, 12 of the stationary frame 2 and sash frame 3, respectively. The window is openable by tilting the sash frame 3 of the window 1 about the pivot hinge axis 21 defined by the pivot hinge. The pivot hinge comprises two parts, namely a stationary frame part 19 and a sash frame part 20.

[0018] 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 parts 20 travels in a curved guide track in the other 19 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.

[0019] As used in this description, a closed position of the window 1 means a position in which the stationary frame plane and the sash frame 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 frame 3 is tilted about the pivot hinge axis 21 such that the stationary frame plane and the sash frame plane no longer coincide.

[0020] As seen in Fig. 1 a longitudinal axis 13 of the window 1 is defined as extending perpendicular to and between the stationary frame top member 5 and the stationary frame bottom member 6, a transversal axis 14 of the window is defined as extending perpendicular to and between the respective stationary 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.

[0021] The window 1 furthermore comprises a locking assembly 17 of a type known per se for locking the stationary frame 2 and sash frame 3 to each other as well as a generally circumferentially extending sealing 18 provided on the sash frame 3 for sealing the gap between

the sash frame 3 and the stationary frame 2 in the closed position of the window 1. The sealing 18 comprises at least one, preferably at least two sealing strips.

[0022] The sash frame 3 and stationary frame 2 of the window according to the invention may for example be made of wooden members or members made of cast or extruded polyurethane (PUR).

[0023] Referring now to Figs. 3 and 4, the window 1 further comprises at least one insulating abutment list 430a, 430b. Here an insulating abutment list is provided on both of the opposing side members 8 and 12 of the sash frame and stationary frame respectively and each extending over approximately half the length of the side frame member. It is, however, also possible, though less preferred, to use an insulating abutment list only on one of the frame side members, possibly extending over its entire length.

[0024] Seen in the height direction, the insulating abutment lists 430a, 430b of this preferred embodiment covers the side frame members 8, 12 down to the sealing strip 18, 433, which is arranged in a groove 18a, 433a in the main body of the side frame member. It is, however, also possible to use an insulating abutment list covering a bigger part of the side member, possibly the entire height, and the sealing strip 18, 433 may then be attached to or integrated in the insulating abutment list. In this embodiment, each frame comprises only a single sealing strip, but particularly the stationary frame may advantageously comprise two sealing strips arranged one above the other.

[0025] The insulating abutment list covers at least a part of the exterior surface of the frame member, i.e. the side intended to face the exterior of a building in the mounted state of the window as may be seen most clearly in Fig. 5, but is also shown in Fig. 4. Here the insulating abutment list covers only a part of the exterior surface of the frame member and in Fig. 4 a recess 83 is provided for receiving the part of the list projecting over the exterior side, but it may also cover a larger part or even the entire exterior surface. Likewise, the insulating abutment list may project over the exterior side in the height direction as in Figs 3 and 5. The design of the abutment list should, however, be made in accordance with the design of the covering and cladding members so as to allow a reliable attachment of these to the frame member and vice versa.

[0026] The insulating abutment lists 430a, 430b shown in Figs. 3-5 are attached to the side frame members 8, 12 by means of screws 431, but other ways of attachment may in principle also be used. As an example the abutment strip may be glued to the main body of the side frame member 8, 12.

[0027] The insulating abutment lists 430a, 430b each comprise a recess 432a, 432b conforming in shape with the respective part 19, 20 of the pivot hinge 200 connecting the stationary frame 2 and the sash frame 3. This enables the insulating abutment list 430 to be mounted adjacent to, possibly even abutting the pivot hinge. Due care should of course be taken to allow the intended

movement of the hinge parts and the two frames in relation to each other.

[0028] The insulating abutment list is made of expanded polystyrene (EPS) or extruded polystyrene (XPS), but may in principle be made of any suitable polystyrene.

[0029] Prior art windows having no insulating abutment list 430 are provided with a sash frame 3 and/or stationary frame 2 having a wooden part or element corresponding to the insulating abutment list 430. Providing the window 1 with insulating abutment lists 430 in lieu of the wooden part or element provides for a close fit and improved sealing of the gap between stationary frame 2 and sash frame 3 in the closed position of the window 1. In addition, a frame 2, 3 build in this way has a smaller thermal conductivity and thus improved heat transfer properties. Thereby the provision of insulating abutment lists 430 provides for a window 1 having a smaller overall heat transfer coefficient, also known as U value or U factor.

[0030] The use of insulating abutment lists may be combined with the use of insulating materials at other positions in the window structure and/or with arranging the window in one or more insulating frames as described for example in EP1061199. An example of such a combination of insulating materials is shown in Fig. 5, where the side member 8 of the stationary frame 2 is provided with an insulating abutment list 430a, where the stationary frame 2 includes a strip 81 of an insulating material and where the window 1 is mounted in an insulating frame 82. Here the insulating frame 82 covers only the lowermost corner of the stationary frame, but it is to be understood that it may cover a larger part of the frame and that two or more such insulating frames may be used in combination. Likewise the strip 81 of insulating material may be at a different position and/or of a different shape and/or be enveloped by the frame material, thus forming a core in the frame member.

[0031] The above embodiment is particularly preferred in case of a wooden window. In case of a PUR-window the insulating abutment list 430 and the side frame member 7, 8, 11, 12 may be made as a one piece integral side frame member, the insulating material of the insulating abutment list being attached to the wooden reinforcement typically used in such frames before moulding.

[0032] Depending on the type of window, it is furthermore possible to provide an insulating abutment list similar to the insulating abutment lists 430a, 430b described above, but attached to and covering substantially at least the half of the side sash frame member 11 nearest the top sash frame member 9 and vice versa for the stationary frame. Likewise, insulating abutment lists may be used in combination with traditional wooden or integrated abutment lists.

[0033] Figs 6 and 7 show an example of an insulating abutment list 434 on the top member 5 of the stationary frame 2. As may be seen the insulating abutment list is profiled to give room for a strike plate 51 and the associated locking assembly 17 on the sash frame 3. This insulating abutment list is furthermore provided with ven-

tilation passages 435 allowing an air-exchange between the interior of a building and the space underneath the top frame covering 500 as indicated by the arrows A in Fig. 7.

[0034] Still referring to Fig 6 the insulating abutment list 434 is fastened to the top frame member 5 by means of plastic screws having relatively large heads. This of course minimizes thermal bridging and the risk of the screw heads damaging the insulating material, but more importantly it makes dismantling very easy for users of the window wishing to install accessories such as an awning or blinds. It is even possible to provide the screws with lugs or slots allowing them to be taken out without the use of a screwdriver or like tool, for example by hand or simply using a flat object such as a coin.

[0035] A window according to the invention is shown in an open state from two different angles in Figs 8 and 9.

20 Claims

1. A centre-hung pivot window (1) with a stationary frame (2) and a sash frame (3), said frames (2, 3) each comprising a top member (5, 9), a bottom member (6, 10) and two side members (7, 8, 11, 12), each having a side surface intended to face a corresponding side surface of the other frame (2, 3) of the window (1),

characterized in that

at least one of the top (5, 9), bottom (6, 10) or side members (7, 8, 11, 12) of at least one of said frames (2, 3) comprises an insulating abutment list (430a, 430b) on the side surface intended to face a side surface of another frame of the window (1), said insulating abutment list (430a, 430b) being made from a polystyrene material having a thermal conductivity of less than 0,08 W/(m·K), preferably less than 0,04 W/(m·K), and that said insulating abutment list (430a, 430b) is positioned where the sash frame (3) comes into contact with the stationary frame (2) during opening and closing of the window, and said insulating abutment list (430a, 430b) closing a gap between the sash frame (3) and the stationary frame (2) formed to make room for hinges, and where the insulating abutment list (430a, 430b) also covers at least a part of the exterior side of the respective frame member.

2. A window according to claim 1, where the insulating abutment list (430a, 430b) is made from a plastic material comprising polystyrene, such as expanded polystyrene (EPS) or extruded polystyrene (XPS).
3. A window according to claim 1 or 2, where hinge parts (19, 20) are attached to the side members (7, 8, 11, 12) so as to form a hinge axis (21), which is substantially parallel to the top member (5, 9) and the bottom member (6, 10), and where insulating

abutment lists (430a, 430b) covers the side surfaces of the parts of the side members (7, 8, 11, 12) extending from the hinge axis (21) to the bottom (6,10) or top member (5, 9) substantially entirely.

4. A window according to claim 3, where recesses are formed in the insulating abutment lists (430a, 430b) at the ends nearest to the hinge parts (19, 20), said recesses conforming in shape to the shape of the hinge parts (19, 20).
5. A window according to any of the preceding claims, where main bodies of the top (5,9), bottom (6,10) and side members (7, 8, 11, 12) are made from wood and where the insulating abutment list(s) (430a, 430b) is/are attached using screws, glue and/or an adhesive.
6. A window according to any of the preceding claims, where the stationary frame (2) comprises at least one insulating abutment list (430a, 430b) on an inner surface facing the sash frame (3) and extending from a hinge part (19) to the top member (5) of the stationary frame (2).
7. A window according to any of the preceding claims, where the sash frame (3) comprises at least one insulating abutment list on an outer surface facing the stationary frame (2) and extending from a hinge part (20) to the bottom member (6) of the sash frame (3).
8. A method for making a centre-hung pivot window with a stationary frame (2) and a sash frame (3), where an insulating abutment list (430a, 430b) is attached permanently or detachably to a main body of a top, bottom or side member of at least one of the frames (2, 3) at a position where the sash frame (3) comes into contact with the stationary frame (2) during opening and closing of the window, so that said insulating abutment list closes a gap between the sash frame (3) and the stationary frame (2) formed to make room for hinges and also covers at least a part of the exterior side of the respective frame member, said insulating abutment list being made from a different material than the main body, said material comprising polystyrene and having a thermal conductivity of less than $0,08 \text{ W/(m}\cdot\text{K)}$.
9. A method according to claim 8, where at least one main body of a frame member is made from wood and where the least one insulating abutment list (430a, 430b) attached thereto is made from expanded polystyrene (EPS) or extruded polystyrene (XPS).

Patentansprüche

1. Mittig aufgehängtes Schwenkfenster (1) mit einem stationären Rahmen (2) und einem Flügelrahmen (3), wobei jeder Rahmen (2, 3) ein oberes Element (5, 9), ein unteres Element (6, 10) und zwei seitliche Elemente (7, 8, 11, 12) aufweist, wobei jedes eine seitliche Oberfläche hat, die vorgesehen ist, einer entsprechenden seitlichen Oberfläche des anderen Rahmens (2, 3) des Fensters (1) gegenüberzuliegen, **dadurch gekennzeichnet, dass** wenigstens eines der oberen (5, 9), der unteren (6, 10) oder der seitlichen Elemente (7, 8, 11, 12) von wenigstens einem der Rahmen (2, 3) eine Isolationsanlageleiste (430a, 430b) an der seitlichen Oberfläche aufweist, die vorgesehen ist, einer seitlichen Oberfläche eines anderen Rahmens des Fensters (1) gegenüberzuliegen, wobei die Isolationsanlageleiste (430a, 430b) aus einem Polystyrolmaterial mit einer Wärmeleitfähigkeit von weniger als $0,08 \text{ W/(m}\cdot\text{K)}$, vorzugsweise weniger als $0,04 \text{ W/(m}\cdot\text{K)}$, hergestellt ist, und dass die Isolationsanlageleiste (430a, 430b) angeordnet ist, wo der Flügelrahmen (3) während des Öffnens und Schließens des Fensters in Kontakt mit dem stationären Rahmen (2) kommt, und wobei die Isolationsanlageleiste (430a, 430b) einen Spalt zwischen dem Flügelrahmen (3) und dem stationären Rahmen (2) verschließt, der gebildet ist, um Raum für Scharniere zu schaffen, und wo die Isolationsanlageleiste (430a, 430b) auch wenigstens einen Teil der äußeren Seite des entsprechenden Rahmenelements abdeckt.
2. Fenster nach Anspruch 1, wobei die Isolationsanlageleiste (430a, 430b) aus einem Kunststoffmaterial hergestellt ist, das Polystyrol aufweist, beispielsweise expandiertes Polystyrol (EPS) oder extrudiertes Polystyrol (XPS).
3. Fenster nach Anspruch 1 oder 2, wobei Scharnierteile (19, 20) an den seitlichen Elementen (7, 8, 11, 12) befestigt sind, um eine Scharnierachse (21) zu bilden, die im Wesentlichen parallel zu dem oberen Element (5, 9) und dem unteren Element (6, 10) ist, und wobei die Isolationsanlageleisten (430a, 430b) die seitlichen Oberflächen der Teile der seitlichen Elemente (7, 8, 11, 12) im Wesentlichen vollständig abdecken, die sich von der Scharnierachse (21) zu dem unteren (6, 10) oder dem oberen Element (5, 9) erstrecken.
4. Fenster nach Anspruch 3, wobei Vertiefungen in den Isolationsanlageleisten (430a, 430b) an den Enden ausgebildet sind, die den Scharnierteilen (19, 20) am nächsten sind, wobei die Vertiefungen in der Form der Form der Scharnierteile (19, 20) entsprechen.

5. Fenster nach einem der vorhergehenden Ansprüche, wobei Hauptkörper der oberen (5, 9), unteren (6, 10) und seitlichen Elemente (7, 8, 11, 12) aus Holz hergestellt sind und wobei die Isolationsanlageleiste(n) (430a, 430b) unter Verwendung von Schrauben, Leim und/oder eines Klebers befestigt ist/sind.
6. Fenster nach einem der vorhergehenden Ansprüche, wobei der stationäre Rahmen (2) wenigstens eine Isolationsanlageleiste (430a, 430b) an einer inneren Oberfläche aufweist, die dem Flügelrahmen (3) gegenüberliegt und sich von einem Scharnierteil (19) zu dem oberen Element (5) des stationären Rahmens (2) erstreckt.
7. Fenster nach einem der vorhergehenden Ansprüche, wobei der Flügelrahmen (3) wenigstens eine Isolationsanlageleiste an einer äußeren Oberfläche aufweist, die dem stationären Rahmen (2) gegenüberliegt und sich von einem Scharnierteil (20) zu dem unteren Element (6) des Flügelrahmens (3) erstreckt.
8. Verfahren zum Herstellen eines mittig aufgehängten Schwenkfensters mit einem stationären Rahmen (2) und einem Flügelrahmen (3), wobei eine Isolationsanlageleiste (430a, 430b) permanent oder lösbar an einem Hauptkörper eines oberen, unteren oder seitlichen Elements von wenigstens einem der Rahmen (2, 3) an einer Position angebracht ist, wo der Flügelrahmen (3) während eines Öffnens und Schließens des Fensters in Kontakt mit dem stationären Rahmen (2) kommt, so dass die Isolationsanlageleiste einen Spalt zwischen dem Flügelrahmen (3) und dem stationären Rahmen (2) schließt, der gebildet ist, um Raum für Scharniere zu schaffen, und auch wenigstens einen Teil der äußeren Seite des entsprechenden Rahmenelements abdeckt, wobei die Isolationsanlageleiste aus einem von dem Hauptkörper unterschiedlichen Material hergestellt ist, wobei das Material Polystyrol aufweist und eine Wärmeleitfähigkeit von weniger als 0,08 W/(m·K) hat.
9. Verfahren nach Anspruch 8, wobei wenigstens ein Hauptkörper eines Rahmenelements aus Holz hergestellt ist und wobei die wenigstens eine daran befestigte Isolationsanlageleiste (430a, 430b) aus expandiertem Polystyrol (EPS) oder extrudiertem Polystyrol (XPS) hergestellt ist.

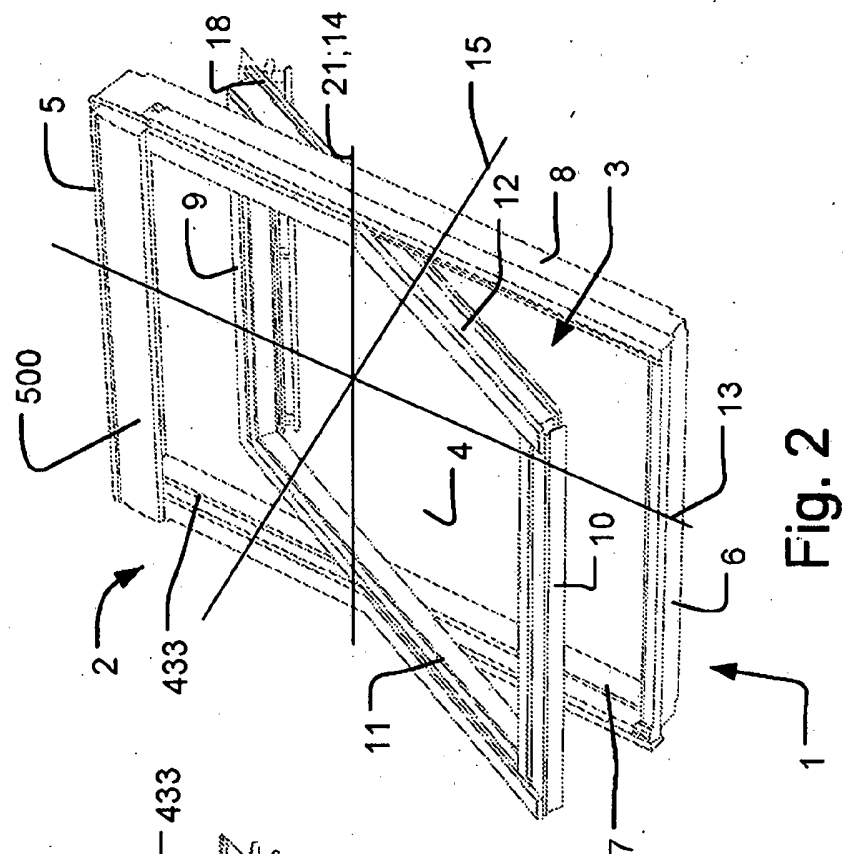
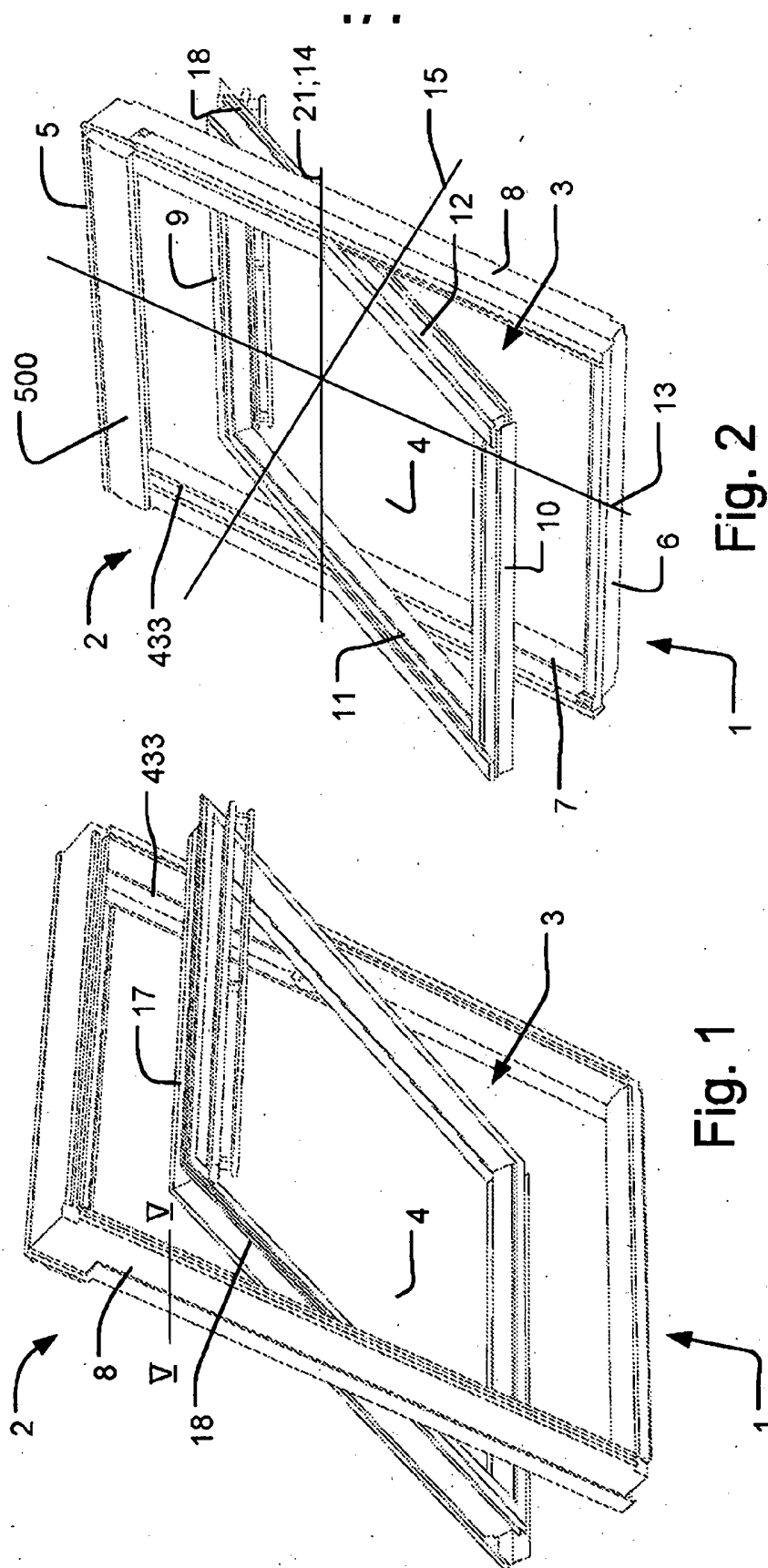
Revendications

1. Fenêtre à pivot à suspension centrale (1) pourvue d'un cadre fixe (2) et d'un cadre de châssis (3), lesdits cadres (2,3) comportant, chacun, un élément

supérieur (5, 9), un élément inférieur (6, 10) et deux éléments latéraux (7, 8, 11, 12), chacun présentant une surface latérale conçue pour faire face à une surface latérale correspondante de l'autre cadre (2, 3) de la fenêtre (1), **caractérisée en ce que** au moins l'un des éléments supérieurs (5, 9), inférieurs (6, 10) ou latéraux (7, 8, 11, 12) d'au moins l'un desdits cadres (2, 3) comporte une pièce de butée isolante (430a, 430b) sur la surface latérale conçue pour se trouver face à une surface latérale d'un autre cadre de la fenêtre (1), ladite pièce de butée isolante (430a, 430b) étant constituée d'un matériau de polystyrène présentant une conductivité thermique inférieure à 0,08 W/(m·K), de préférence inférieure à 0,04 W/(m·K), et **en ce que** ladite pièce de butée isolante (430a, 430b) est positionnée à l'endroit où le cadre de châssis (3) se trouve en contact avec le cadre fixe (2) pendant l'ouverture et la fermeture de la fenêtre, et **en ce que** ladite pièce de butée isolante (430a, 430b) ferme un espace compris entre le cadre de châssis (3) et le cadre fixe (2) formé pour servir de logement à des pièces d'articulation, et à l'endroit où la pièce de butée isolante (430a, 430b) couvre également au moins une partie du côté extérieur de l'élément de cadre respectif.

2. Fenêtre selon la revendication 1, dans laquelle la pièce de butée isolante (430a, 430b) est constituée d'un matériau plastique comportant du polystyrène, tel que du polystyrène expansé (EPS) ou du polystyrène extrudé (XPS).
3. Fenêtre selon la revendication 1 ou 2, dans laquelle les pièces d'articulation (19, 20) sont fixées sur les éléments latéraux (7, 8, 11, 12) de façon à former un axe d'articulation (21), lequel est essentiellement parallèle à l'élément supérieur (5, 9) et à l'élément inférieur (6, 10), et dans laquelle les pièces de butée isolantes (430a, 430b) couvrent les surfaces latérales des parties des éléments latéraux (7, 8, 11, 12) s'étendant de l'axe d'articulation (21) à l'élément inférieur (6, 10) ou à l'élément supérieur (5, 9) de façon substantiellement totale.
4. Fenêtre selon la revendication 3, dans laquelle des évidements sont formés dans les pièces de butée isolantes (430a, 430b) au niveau des extrémités les plus proches des pièces d'articulation (19, 20), lesdits évidements étant conformes à la configuration des pièces d'articulation (19, 20).
5. Fenêtre selon l'une quelconque des revendications précédentes, dans laquelle les corps principaux des éléments supérieurs (5, 9), inférieurs (6, 10) et latéraux (7, 8, 11, 12) sont constitués de bois et dans laquelle la (les) pièce(s) de butée isolante(s) (430a, 430b) est (sont) fixée (s) en utilisant des vis, de la colle et/ou un adhésif.

6. Fenêtre selon l'une quelconque des revendications précédentes, dans laquelle le cadre fixe (2) comporte au moins une pièce de butée isolante (430a, 430b) sur une surface intérieure se trouvant face au cadre de châssis (3), et s'étendant depuis une pièce d'articulation (19) jusqu'à l'élément supérieur (5) du cadre fixe (2). 5
7. Fenêtre selon l'une quelconque des revendications précédentes, dans laquelle le cadre de châssis (3) comporte au moins une pièce de butée isolante sur une surface extérieure se trouvant face au cadre fixe (2) et s'étendant depuis une pièce d'articulation (20) jusqu'à l'élément inférieur (6) du cadre de châssis (3). 10 15
8. Procédé de fabrication d'une fenêtre à pivot à suspension centrale dotée d'un cadre fixe (2) et d'un cadre de châssis (3), dans lequel une pièce de butée isolante (430a, 430b) est fixée de façon permanente ou détachable sur un corps principal d'un élément supérieur, inférieur ou latéral d'au moins l'un des cadres (2, 3) au niveau d'une position où le cadre de châssis (3) vient en contact avec le cadre fixe (2) pendant l'ouverture et la fermeture de la fenêtre, de sorte que ladite pièce de butée isolante ferme un espace compris entre le cadre de châssis (3) et le cadre fixe (2) formé pour servir de logement aux pièces d'articulation et couvre également au moins une partie du côté extérieur de l'élément de cadre respectif, ladite pièce de butée isolante étant constituée d'un matériau différent de celui du corps principal, ledit matériau comportant du polystyrène et présentant une conductivité thermique inférieure à 0,08W/(m·K). 20 25 30 35
9. Procédé selon la revendication 8, dans lequel au moins un corps principal d'un élément de cadre est constitué de bois et dans lequel au moins une pièce de butée isolante (430a, 430b) fixée sur lui est constituée de polystyrène expansé (EPS) ou de polystyrène extrudé (XPS). 40 45 50 55



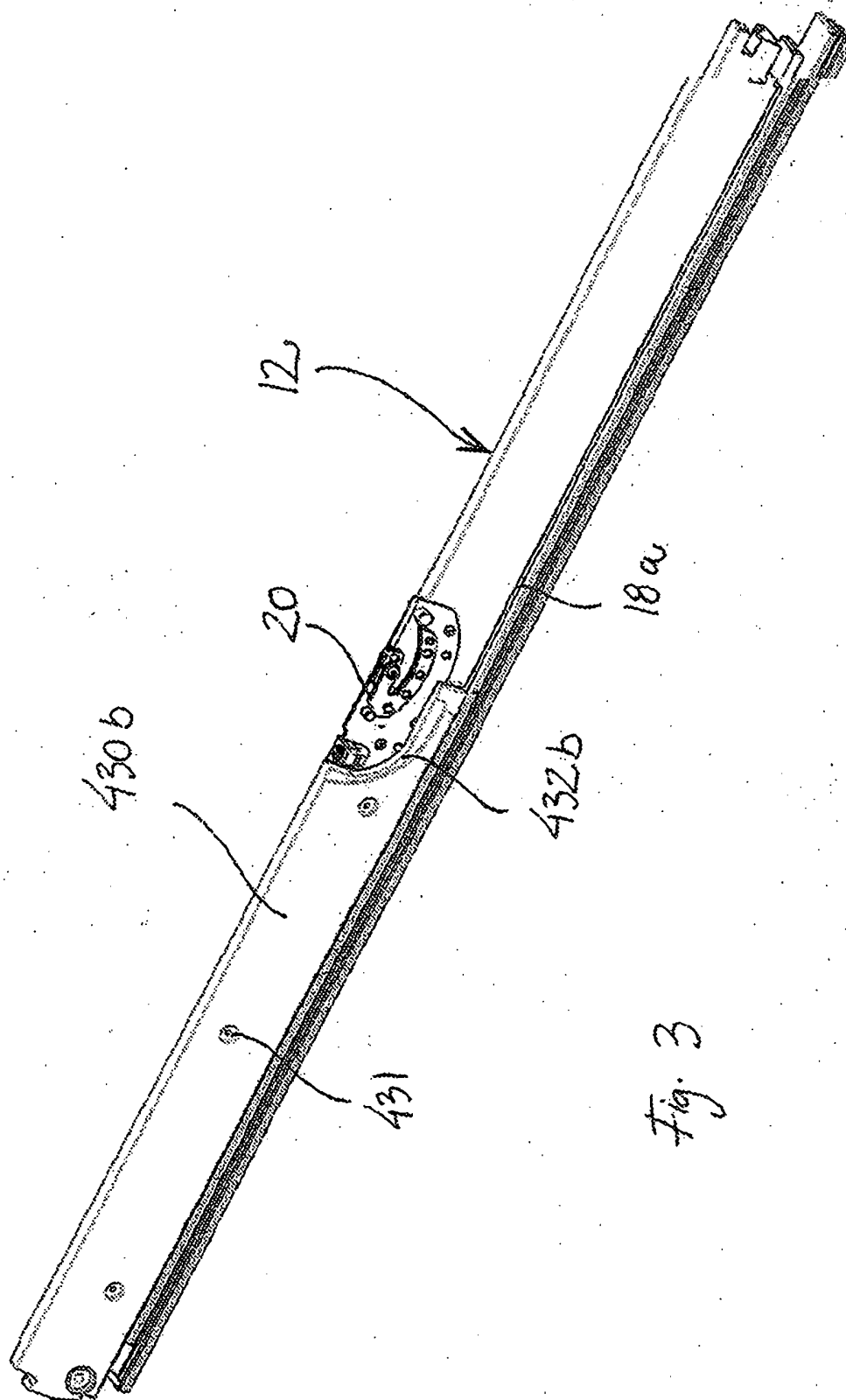


Fig. 3

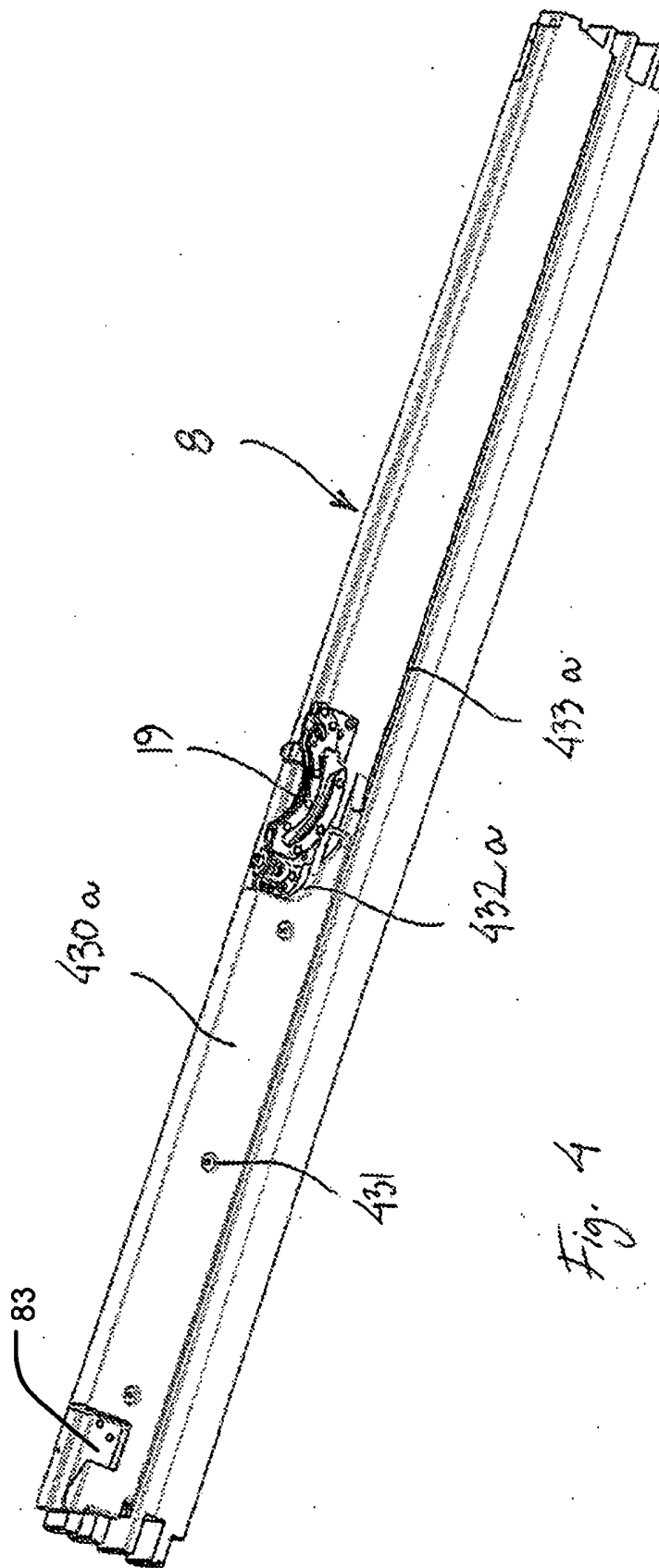


Fig. 4

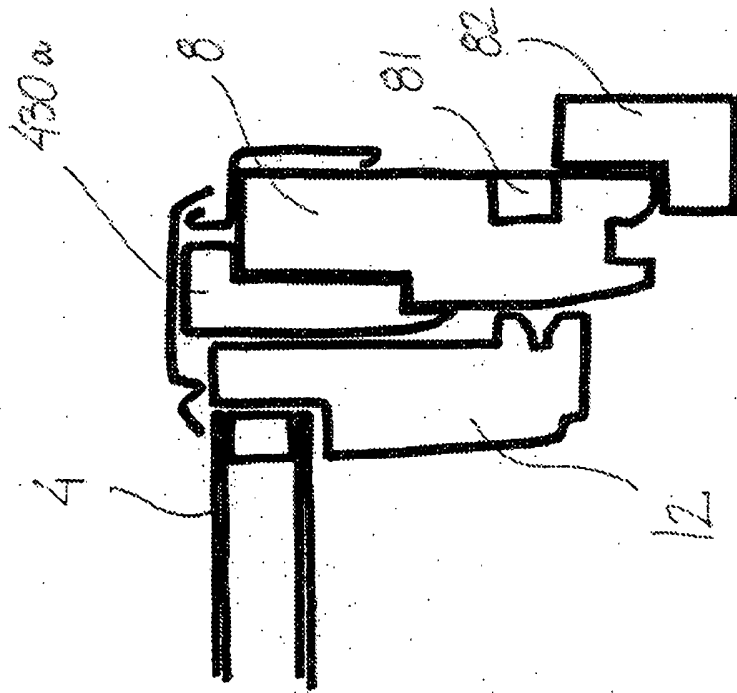


Fig. 5

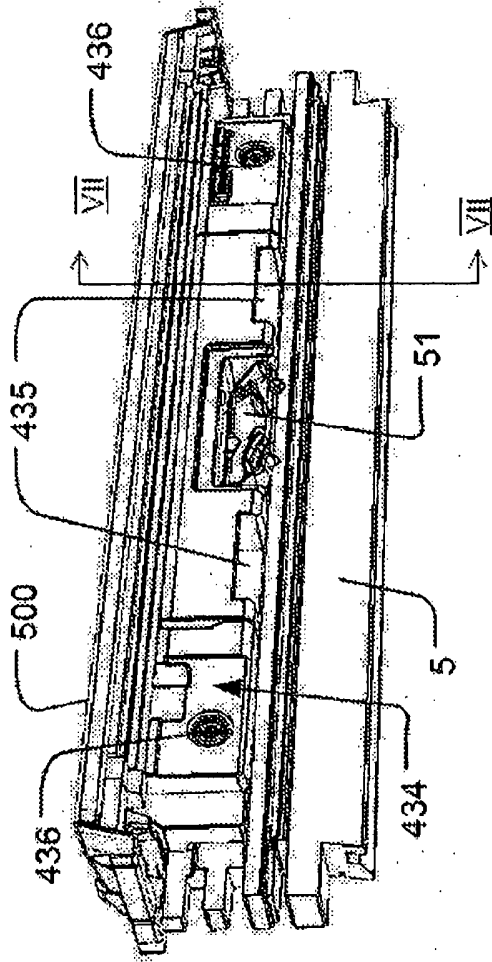


Fig. 6

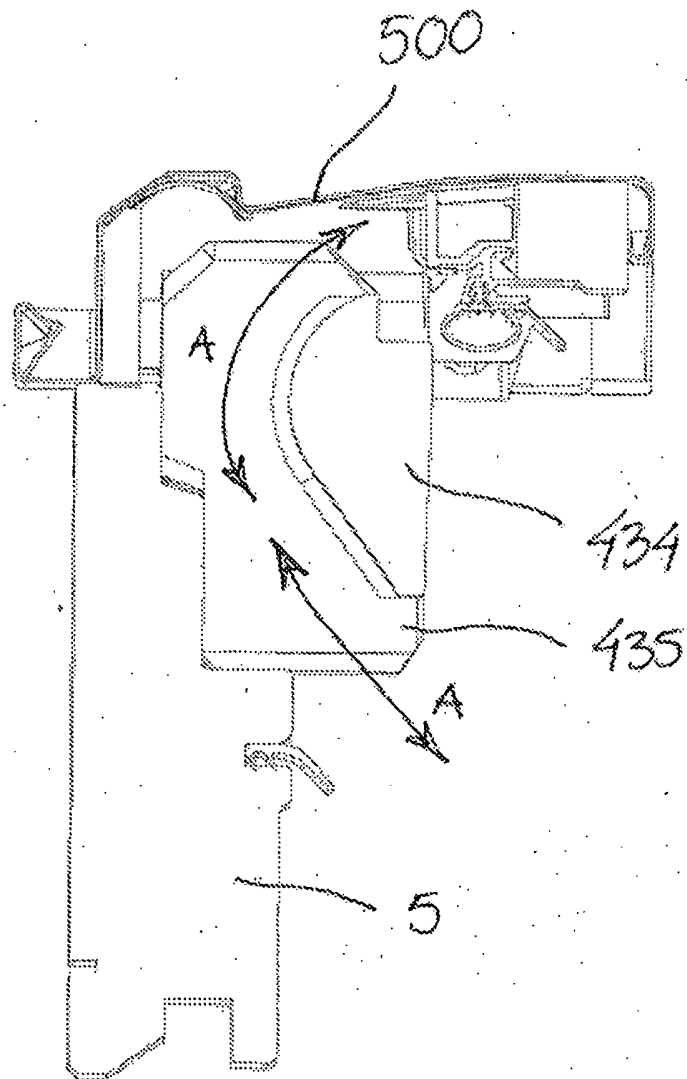


Fig. 7

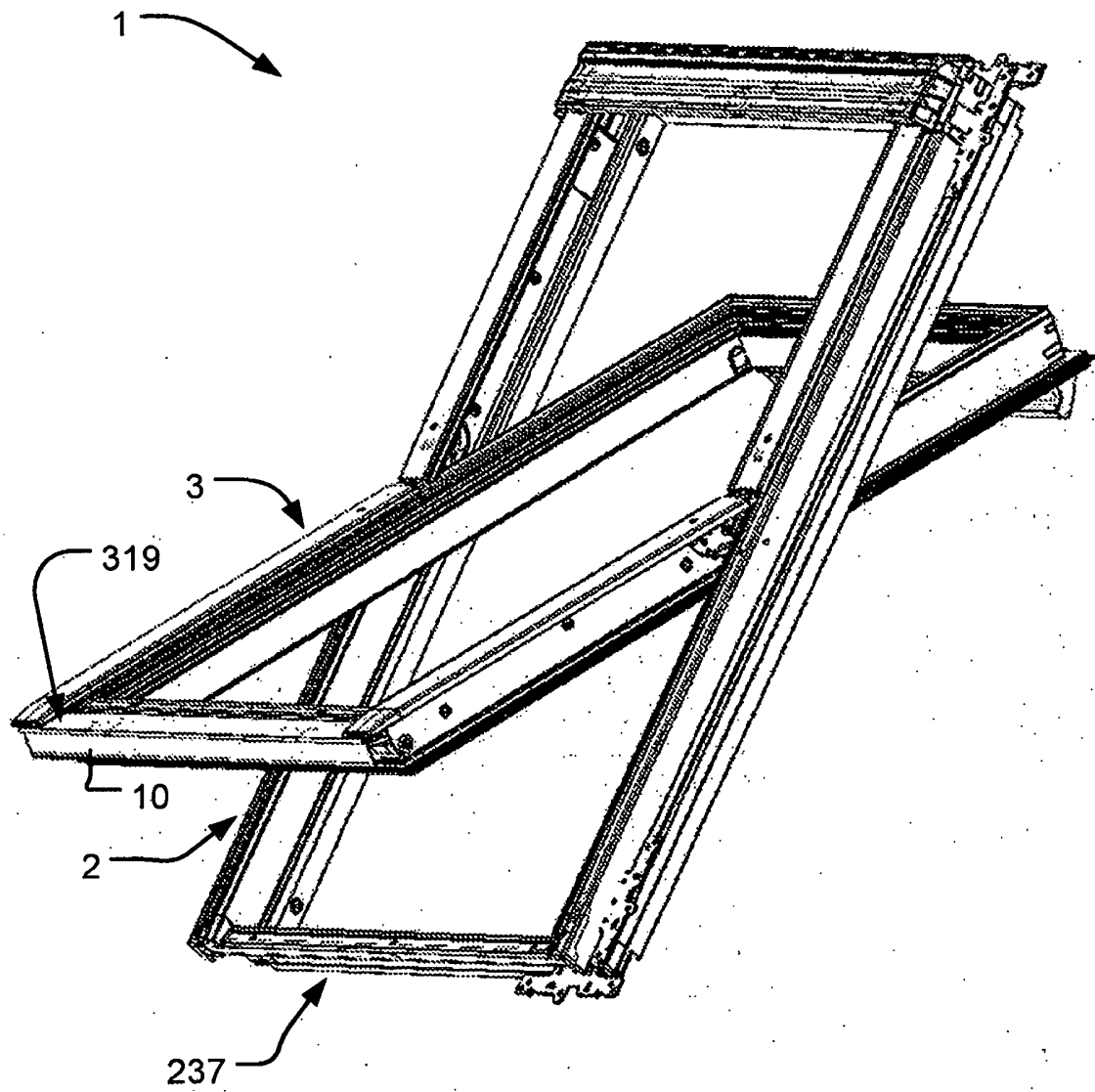


Fig. 8

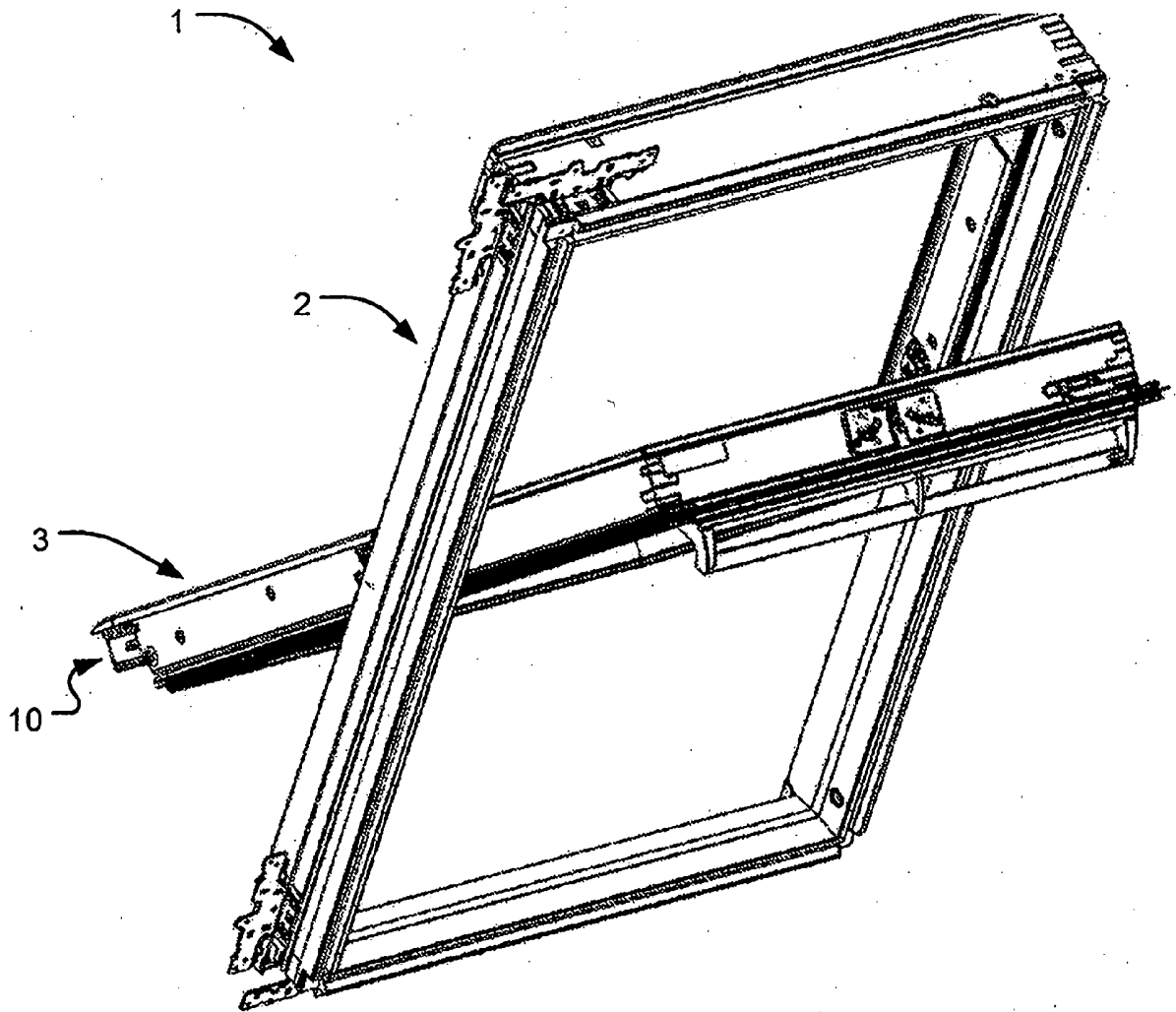


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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(EP 2748391)

1. Középen billenő ablak (1), amely nem mozgó kerettel (2) és ablakszárny kerettel (3) rendelkezik, amely keretek (2, 3) mindegyike - az ablak (1) másik keretének (2, 3) megfelelő oldalfelülete felé néző oldalfelülettel rendelkező - felső tagot (5, 9), alsó tagot (6, 10), és két oldalsó tagot (7, 8, 11, 12) tartalmaz, **azzal jellemezve**, hogy legalább az egyik keret (2, 3) felső tagjának (5, 9), alsó tagjának (6, 10), vagy oldalsó tagjának (7, 8, 11, 12) legalább egyike az ablak (1) másik keretének (2, 3) megfelelő oldalfelülete felé néző oldalfelületén szigetelő érintkezőréteget (430a, 430b) tartalmaz, amely szigetelő érintkezőréteg (430a, 430b) polisztirol anyagból készül, melynek hővezető képessége alacsonyabb, mint $0,08 \text{ W/(m} \cdot \text{K)}$, előnyösen alacsonyabb, mint $0,04 \text{ W/(m} \cdot \text{K)}$, és a szigetelő érintkezőréteg (430a, 430b) ott van elrendezve, ahol az ablakszárny keret (3) és az álló keret (2) az ablak (1) nyitása és zárása során egymással érintkezésbe kerül, és a szigetelő érintkezőréteg (430a, 430b) az ablakszárny keret (3) és az álló keret (2) közötti - a zsanéroknek helyet adó - rést záróan van kialakítva, és a szigetelő érintkezőréteg (430a, 430b) a megfelelő keret tag külső oldalának legalább egy részét lefedi.

2. Az 1. igénypont szerinti ablak, **azzal jellemezve**, hogy a szigetelő érintkezőréteg (430a, 430b) polisztirolt, úgymint expandált polisztirolt (EPS) vagy extrudált polisztirolt (XPS) tartalmazó műanyagból készül.

3. Az 1. vagy 2. igénypont szerinti ablak, **azzal jellemezve**, hogy az oldalsó tagokhoz (7, 8, 11, 12) a felső taggal (5, 9) és az alsó taggal (6, 10) lényegében párhuzamos zsanér tengelyt (21) meghatározó zsanér részek (19, 20) vannak csatlakoztatva, és a szigetelő érintkezőréteg (430a, 430b) az oldalsó tagoknak (7, 8, 11, 12) a zsanér tengely (21) felől az alsó tag (6, 10) vagy a felső tag (5, 9) felé kiterjedő részeinek oldalfelületeit lényegében teljesen lefedi.

4. A 3. igénypont szerinti ablak, **azzal jellemezve**, hogy a szigetelő érintkezőréteg (430a, 430b) zsanér részekhez (19, 20) legközelebbi végein a zsanér részek (19, 20) formájának megfelelő formájú vájatok vannak kialakítva.

5. Az 1- 4. igénypontok bármelyike szerinti ablak, **azzal jellemezve**, hogy a felső tag (5, 9), alsó tag (6, 10), és az oldalsó tag (7, 8, 11, 12) teste fából készül és az

egy vagy több szigetelő érintkezőréteg (430a, 430b) csavarok, ragasztó és/vagy kötőanyag segítségével van csatlakoztatva.

6. Az 1- 5. igénypontok bármelyike szerinti ablak, **azzal jellemezve**, hogy az álló keret (2) az ablakszárny keret (3) felé néző, és a zsanér rész (19) felől az álló keret (2) felső tagja (5) felé kiterjedő belső felületén legalább egy szigetelő érintkezőréteget (430a, 430b) tartalmaz.

7. Az 1- 6. igénypontok bármelyike szerinti ablak, **azzal jellemezve**, hogy az ablakszárny keret (3) az álló keret (2) felé néző, és a zsanér rész (20) felől az ablakszárny keret (3) alsó tagja (6) felé kiterjedő külső felületén legalább egy szigetelő érintkezőréteget (430a, 430b) tartalmaz.

8. Eljárás álló keretet (2) és ablakszárny keretet (3) tartalmazó, középen billenő ablak (1) előállítására, **azzal jellemezve**, hogy legalább az egyik keret (2, 3) felső tagjának (5, 9), alsó tagjának (6, 10), vagy oldalsó tagjának (7, 8, 11, 12) testéhez - ott, ahol az ablakszárny keret (3) és az álló keret (2) az ablak (1) nyitása és zárása során egymással érintkezésbe kerül - oldhatatlan vagy oldható módon szigetelő érintkezőréteget (430a, 430b) rögzítünk, úgy, hogy a szigetelő érintkezőréteg (430a, 430b) az ablakszárny keret (3) és az álló keret (2) közötti - a zsanéroknak helyet adó - rést zárja és a szigetelő érintkezőréteg (430a, 430b) a megfelelő keret (2, 3) külső oldalának legalább egy részét lefedi, és a szigetelő érintkezőréteg (430a, 430b) a test anyagától különböző anyagból van kialakítva, amely anyag polisztirolt tartalmaz, és amely anyag hővezető képessége alacsonyabb, mint $0,08 \text{ W/(m} \cdot \text{K)}$.

9. A 8. igénypont szerinti eljárás, **azzal jellemezve**, hogy legalább az egyik keret tag teste fából készül, és az ahhoz csatlakoztatott legalább egy szigetelő érintkezőréteg (430a, 430b) expandált polisztirolból (EPS) vagy extrudált polisztirolból (XPS) készül.