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(54) **A REVERSIBLE WINDOW, USE THEREOF AND A GUIDE DEVICE FOR A REVERSIBLE WINDOW**

UMKEHRFENSTER, DESSEN VERWENDUNG UND FÜHRUNGSVORRICHTUNG FÜR EIN UMKEHRFENSTER

FENETRE REVERSIBLE, UTILISATION CORRESPONDANTE ET DISPOSITIF DE GUIDAGE POUR FENETRE REVERSIBLE

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Description

[0001] The present invention relates to a reversible window comprising a frame and a sash which is displaceably and swingably connected at one end to the frame, and a guide device comprising a tension member which is pivotally connected at one end to the frame, and a pressure rod which is pivotally connected at one end to the sash near the latter's centre of gravity and is connected at the other end to the frame, the other end of the tension member being connected to the pressure rod at a location between the ends of this rod, and use of such reversible window.

[0002] The present invention also relates to a guide device for a reversible window, the device comprising a tension member which is adapted at one end for pivotal connection with a frame, and a pressure rod which is adapted at one end for pivotal connection with a sash and is adapted at the other end for displaceable connection with the frame, the other end of the tension member being connected to the pressure rod at a location between the ends of this rod.

[0003] Reversible windows of this type are very practical as front windows as these reversible windows can be rotated substantially 180 degrees, allowing for cleaning of the outside of the window from the inside, which obviously makes it much easier to clean the windows, particularly if they are located high above the ground. Despite this advantage, reversible windows are not much in use, one reason being that the prior-art reversible windows are somewhat more expensive than, for example, top-hung windows, and another reason being that they often deviate in appearance from other windows, thus ruining the architecture of a coherent glass front.

[0004] WO 96/17151 describes a reversible window of the above type mounted with a link arm mechanism. The inward-facing side surfaces of the window frame are provided with a groove with which one end of the window sash engages. The link arm mechanism comprises a pressure rod, one end of which also displaceably engages with the frame groove, while the other end of the rod is pivotally fastened to the sash near the latter's centre of gravity, and a tension rod one end of which is pivotally connected to the frame while the other end is pivotally connected to the pressure rod at a point between the latter's ends. This window structure requires frame and sash to be custom-made or adapted for this purpose as grooves have to be provided in the opening of the frame, and the frame or the sash must be provided with suitable recesses to make room for the link arm mechanism. Mounting of the link arm mechanism is made difficult because it is mounted inside the opening of the frame, which results in difficult working positions at mounting.

[0005] WO 00/28184 describes a fitting for a reversible window, one end of the window sash being guided in a guide in the frame. The fitting comprises a telescopic arm which is fastened at one end to the frame and is fastened at the other end to the side jambs of the sash approximately at the centre of gravity of the sash. The fitting also comprises a tension rod which is fastened at one end to the frame and at the other end to the telescopic arm. It is indicated that the tension rod has been made very thin so that it is hardly visible, the rest of the fitting being apparently hidden behind the sash. Also this window structure requires grooves to be provided in the side surfaces of the frame opening for guiding the sash. Mounting of the fitting is also made difficult because the tension rod is mounted inside the opening, which results in a difficult working position, and it will probably also be necessary to provide the frame with a recess to make room for the fitting.

[0006] US 4, 616, 443 describes a reversible window for preventing the protrusion of a sash from a frame toward the indoor side during reversal of the sash and for facilitating said reversal. The window comprises a tension member and a movable link member interposed between a pressure rod and a frame.

[0007] DE 43 14 404 describes a conversion kit for converting a pitch roof swing window to a top-hung swing window with an intermediate sash. The converted window comprises swingable arms attached at one end to the upper end of a frame and at the other end to the sash.

[0008] It is an object of the present invention to provide a reversible window of the type mentioned in the introduction for particularly simple mounting.

[0009] In view of this object, the reversible window is characterized in that the guide device is mounted on the face of the frame. This structure allows very easy mounting of the guide device, as the mounting is not, as in the prior-art reversible windows, made inside the frame opening, but directly on the face of the frame, which results in much better working positions at mounting. Another advantage of this structure is that the reversible window may consist of a standard frame and a standard sash, as special adaptation of the frame or sash is not required or, for example, a particularly narrow sash. It is furthermore advantageous that the guide device is not mounted in the opening of the frame, as no gap or recess between frame and sash is required at mounting on the face of the frame. This allows the use of a standard frame and sash without any need for subsequent refinishing thereof.

[0010] In one embodiment, the reversible window is characterized in that the pressure rod consists of a first part hinge-connected to the frame and a second part hinge-connected to the sash, the two parts being in telescopic connection. This makes it possible for the centre of gravity of the sash to move along an approximately rectilinear path outwards from the frame, and at the same time a guide device of a particular size can fit reversible windows of varying sizes as the telescopic connection can absorb this variety.

[0011] In an alternative embodiment, the reversible window is characterized in that the pressure rod is displaceably connected at its other end to the frame. This makes it possible in a simple manner for the centre of

gravity of the sash to move along an approximately rectilinear path outwards from the frame. In relation to the telescopic connection mentioned above, the displaceably connected pressure rod has the advantage that it consists of fewer parts and also that it provides more reliable guiding of the sash.

[0012] Grooves in the frame may, of course, be provided for the displaceable connection, but in a preferred embodiment the reversible window is characterized in that the guide device also comprises a rail extending along the face of the frame substantially in the entire length of the frame and displaceably receiving an engagement member connected to one end of the sash.

[0013] In one embodiment, the reversible window is characterized in that the rail displaceably receives the other end of the pressure rod. Since the sash and the pressure rod are displaced in one and the same rail, no more rails are required, which reduces costs and facilitates mounting.

[0014] The reversible window may, of course, be provided with a guide device in which the tension member and the pressure rod are of the same thickness, but preferably the tension member is substantially thinner than the pressure rod. This is possible since the tension member is, only exposed to tensile loads owing to the net weight of the sash and the pane, and dimensioning for tensile loads results in much smaller dimensions than dimensioning for pressure loads, where, for example, deflection also has to be taken into account. It is thus possible to minimize the material consumption for this first arm, and thus also the weight of the complete structure, and moreover the dimensions of the guide device become smaller, and the guide device is thus easier to fit into the reversible window.

[0015] In a preferred embodiment, the reversible window is characterized in that, at its sides, the sash is provided with a flange which, in a front view of the window in the closed position, substantially hides the second arm of the guide device. This provides a very discreet incorporation of the guide device, as the only visible part of the guide device of a closed window will be the tension member which must be able to pass the exterior of the sash.

[0016] Another aspect of the present invention relates to the use of a reversible window of the above type.

[0017] The reversible window may, of course, be a single element of, for example, a brick front. However, it is a particular advantage of the present reversible window that it is possible to build a front with several closely spaced windows, the frame part of the reversible window being placed closely up against the frame part of an adjacent window, such as a pivot-hung, tilting or reversible window or a fixed window.

[0018] Due to the construction of the reversible window with a very discreet guide device which, in the closed position of the window, may be substantially hidden by the sash, which may also hide the frame, it is possible to arrange the reversible window closely adjacent to other windows without resulting conspicuous deviations and wide gaps between the window sashes, as would be the case with conventional reversible windows. Of course, this optimum possibility occurs in the cases where, as mentioned above, the sash and frame are standard components which are also used in pivot-hung and tilting windows and fixed windows without opening capacity so that the reversible windows do not deviate in appearance from other windows, thus retaining the architecture of a coherent glass front.

[0019] Another object of the present invention is to provide a guide device of the type mentioned in the introduction for a reversible window, which guide device is of a design allowing particularly discreet incorporation into a reversible window.

[0020] In view of this object the guide device is characterized in that the tension member has a thickness of less than 2 mm, preferably approximately 1.5 mm. This is possible, as the tension member is substantially only exposed to tensile loads which a relatively thin metal arm is well capable of bearing. Since, in the present structure, the tension member is the only part of the guide device that has to pass the exterior of the sash, the visible part of the guide device in the closed position thereby becomes minimal, as the rest of the guide device can be hidden behind the face of the sash. The necessary thickness of the tension member will depend on the size and weight of the sash with pane, but for front windows of an ordinary size a tension member with a thickness of between 1.5 and 2 mm will be a sensible compromise between reliable guiding of the sash and a discreet guide device. If it is of particular importance to obtain a discreet guide device which is hardly visible, one option is a guide device in which the tension member has a thickness of less than 1.5 mm, and in principle the arm might, for example, be constituted by a thin wire.

[0021] In one embodiment the guide device is an integral structure consisting of a rail to which the other end of the pressure rod is displaceably connected, and at the end of which the first end of the tension member is pivotally connected. With the guide device designed as an integral structure, mounting of the device is extremely simple. The rail is thus mounted on the face of the frame, which can be done from the outside in a natural working position, for example, if the fitter is standing on scaffolding. As the rail is pre-fitted with tension member and pressure rod correctly positioned in relation to each other, the tension member merely has to be fastened to the sash and the sash to the rail. The entire mounting can therefore be performed quickly and thus at low cost, and moreover ergonomically correct. A further advantage is that the guide device is an integral structure, as this minimizes the risk that parts of a wrong dimension for the relevant window are used at the mounting, or that parts get lost before or during the mounting of the reversible window. For the fitter it may thus be rather difficult to keep track of many small individual parts if he is working on a restricted area, for example, on scaffolding, and if a part is

lost, it often has to be replaced as it is rarely possible to find it again.

[0022] The invention will now be described in more detail below by means of examples and with reference to the accompanying drawing, in which

Fig. 1 is a perspective view of a reversible window according to the invention in an open position,
Fig. 2 is a side view of the reversible window,
Fig. 3 is a cross-sectional view of the frame and sash of the reversible window,
Fig. 4 is a sectional view along IV-IV in Fig. 2, and
Fig. 5 is a sectional view along V-V in Fig. 2.

[0023] Fig. 1 shows a reversible window 1 in a slightly open position, the window 1 comprising a frame 2 and a sash 3 which is displaceably connected at its upper end to the frame 2, for example, by means of a stud in a groove or a slide shoe inserted in a rail. Moreover, at each side the reversible window 1 comprises a guide device 4, which is seen more clearly in Fig. 2, showing a side view of the reversible window 1 in an open position. The guide device comprises a tension member 5 which is hinge-connected at one end 5a to the frame 2, and a pressure rod 6 which is pivotally connected at one end 6a to the sash 3 approximately at the latter's centre of gravity and is displaceably connected at its other end 6b to the frame 2, for example, by means of a slide shoe or a stud in engagement with a rail 7. It is apparent that in this open position the tension member 5 passes the side edge of the sash 3. The tension member 5 lies within the external periphery of the frame 2 and may suitably be closely adjacent to this external periphery of the frame 2, as the frame width may correspond to the sash width plus the thickness of the two tension members. In this case it is thus possible to arrange two reversible windows 1 closely adjacent to each other with their respective frames 2 abutting each other discreetly, the sashes 3 hiding the frames 2 and the guide devices 4 apart from a narrow gap corresponding to the double thickness of the tension member 5. Since the tension member 5 may have a thickness of, for example, 1.5 mm, the gap need not be wider than 3 mm, which makes it practically invisible. Furthermore, for the frame and sash, standard components may be used which are also used for the building of pivot-hung and tilting windows as well as fixed windows.

[0024] Fig. 3 shows a cross-sectional view of the frame 2 and the sash 3 as well as the pane 8 mounted in the sash. In the Figure the reversible window is shown in the closed position in which the guide device 4 is folded down along the side of the sash 3. It is apparent that the guide device 4 is mounted on the face 2a of the frame 2, the pressure rod 6 being displaceably connected to the rail 7 in the example shown, which is seen in Fig. 5. The sash 3 may suitably be displaceably connected at its upper end to the same rail 7, which is seen in Fig. 4, and the tension member 5 may be hinge-connected at its one end 5a to the rail 7, possibly by means of a fitting mounted thereon as indicated in Figs. 1 and 2. The pressure rod 6 is hinge-connected at one end 6a to the sash 3 at the latter's outward side opposite to the pane 8. As is apparent, along its sides the sash 3 is provided with a flange 3' which projects beyond the pressure rod 6 and the rail 7 and thus hides the pressure rod 6 and the rail 7 as seen from the front, while the tension member 5, which must be able to pass the sash 3, will be visible from the front past the flange 3' of the sash. However, as is apparent, the tension member 5 is very thin so that, as seen from the front, it will be hard to see it. In a manner not shown, the tension member 5 may be bent in its longitudinal direction so that its cross-section will be a V-shape slightly open outwards. This makes it possible for the tension member 5, which has to pass along the edge of the sash 3, to slide on its middle instead of along its rather sharp edge, which might otherwise scrape the sash 3. The tension member 5 and/or the sash edge may moreover be provided with a coating of a friction-reducing material, such as Teflon. The rail 7 may have its open side outwards, but preferably the rail 7 is open towards the opening of the frame, as shown, as this provides further security against the pressure rod 6 or the sash 3 coming out of engagement with the rail 7 during the opening movement if the outward force becomes large. Instead of a partially closed rail 7 as the one shown, the rail may be completely open, but the rail shown makes it possible to ensure that the slide shoe is always sure of positive engagement with the rail and cannot leave it. As shown, the frame 2 may be provided with an indent for partial reception of the sash 3 in order to obtain good sealing of the window. As is apparent, the reversible window 1 may be designed so that the sash 3 is not seen from the inside, as it will be hidden by the frame 2, and as distinguished from many conventional reversible windows the sash 3 thus does not reduce the opening of the reversible window, thus providing the largest possible light incidence.

[0025] Fig. 4, which is a sectional view along IV-IV in Fig. 2, shows a section through the frame 2 and the sash 3 at the fastening of the sash 3 to the frame 2 in a slightly open position of the reversible window 1. It is apparent that the sash 3 is displaceably connected at its upper end to the frame 2, the sash 3 being provided with a slide shoe 9 engaging with the rail 7, thus providing reliable guiding of the sash 3. In this open position of the reversible window 1, the tension member 5 passes the exterior of the sash 3, passing closely along the exterior of the sash 3 and possibly sliding along the exterior of the sash-3 during the opening movement of the reversible window 1. In the example, the sash 3 is connected to the frame 2 at the upper end of the sash 3, but it is evident that the reverse situation in which the sash 3 is instead displaceably connected to the frame 2 at its lower end is also imaginable, and guide devices 4 may also be conceived for reversal of the reversible window 1 about a vertical axis so that the sash 3 is displaceably connected to the upper and lower members of the frame 2. However,

this necessitates a different dimensioning of the arms 5,6, as in this situation the tension member 5 is no longer exposed only to a purely tensile load.

[0026] Another sectional view through the frame 2 and the sash 3 at a slightly open reversible window 1 is shown in Fig. 5. This Figure, which is a sectional view along V-V in Fig. 2, shows a section through the frame 2 and the sash 3 at the place where the pressure rod 6 is hinge-connected by means of its one end 6a to the sash 3. The pressure rod 6 is connected at its other end 6b to the frame 2, the arm 6 at this other end 6b being provided with a slide shoe 10 in engagement with the rail 7. It is also indicated that the tension member 5 is hinge-connected to the pressure rod 6 at a location between the one erid 6a and the other end 6b of the pressure rod 6.

[0027] The reversible window may also suitably be provided with a locking fitting which can retain the reversible window in the reversed position (cleaning position) to obviate the risk that the window will reverse again during the cleaning.

[0028] The reversible window may furthermore be provided with means for locking the window against reversal so that this lock has to be actively released before the window can be reversed in order to prevent unintended reversal of the window. This may be particularly suitable to ensure that children or animals do not reverse the window unintentionally, thus risking falling out of the window..

[0029] The reversible window may also have some degree of built-in friction so that the sash can be retained in any random position. The friction may, for example, be built into the displaceable connection of the sash to the frame and/or the rail and the pressure rod and may possibly be of an order so that the friction will prevent small children and animals from reversing the window.

[0030] The reversible window shown in the drawing and reviewed in the example functions as a top-hung window moving outwards at the bottom, and in general use it will not differ substantially from a top-hung window, but naturally with the built-in extra option of reversing the window substantially 180 degrees so that the window can be cleaned from the inside. Alternatively, the reversible window may have a function as a bottom-hung window moving outwards at the top, which is sometimes preferred, for example in view of ventilation and to prevent draughts in the room.

Claims

1. A reversible window (1) comprising a frame (2) and a sash (3) which is displaceably and swingably connected at one end to the frame (2), and a guide device (4) comprising a tension member (5) which is pivotally connected at one end (5a) to the frame (2), and a pressure rod (6) which is pivotally connected at one end (6a) to the sash (3) near the latter's centre of gravity and is connected at the other end (6b) to the frame (2), the other end of the tension member (5b) being connected to the pressure rod (6) at a location between the ends (6a, 6b) of this rod, **characterized in that** the guide device (4) is mounted on the face (2a) of the frame (2).

2. A reversible window (1) according to claim 1, wherein the sash (3) is dimensioned to substantially hide the frame (2).

3. A reversible window (1) according to claim 1 or 2, wherein the frame width corresponds to the sash width plus the thickness of two tension members.

4. A reversible window (1) according to any of the claims above, wherein the tension member (5) and/or the sash edge is provided with a coating of a friction-reducing material, such as Teflon.

5. A reversible window (1) according to any of the claims above, wherein the reversible window has built-in friction so that the sash can be retained in any random position.

6. A reversible window (1) according to any of the claims above, **characterized in that** the pressure rod (6) consists of a first part (6') hinge-connected to the frame (2) and a second part (6") hinge-connected to the sash (3), the two parts (6', 6") being in telescopic connection.

7. A reversible window (1) according to any of the claims 1-6, **characterized in that** the pressure rod (6) is displaceably connected at its other end (6b) to the frame (2).

8. A reversible window (1) according to any one of the preceding claims, **characterized in that** the guide device (4) also comprises a rail (7) extending along the face of the frame (2) substantially in the entire length of the frame and displaceably receiving an engagement member, such as a stud or a shoe, connected to one end of the sash (3).

9. A reversible window (1) according to claim 8, **characterized in that** the rail (7) displaceably receives the other end (6b) of the pressure rod (6).

10. A reversible window (1) according to any one of the preceding claims, **characterized in that** the tension member (5) is substantially thinner than the pressure rod (6).

11. A reversible window (1) according to any of the preceding claims, wherein the tension member is a wire.

12. A reversible window (1) according to any of the preceding claims, wherein the tension member is a strip

element having a slight V-shape in cross-section.

13. A reversible window (1) according to any one of the preceding claims, **characterized in that**, at its sides, the sash (3) is provided, with a flange (3') which, in a front view of the window in the closed position, substantially hides the pressure rod (6).

14. A reversible window (1) according to any one of claims 8-13, **characterized in that** the rail (7) extends along the outer edge of the frame (2).

15. A reversible window (1) according to any of the claims 8-14, wherein the rail (7) is of U-shape with the opening thereof facing the clear opening of the window.

16. A reversible window (1) according to any of the claims above, designed in such a way that the sash (3) is hidden by the frame (2) when seen from the inside.

17. A reversible window (1) according to any of the claims above, which is furthermore provided with means for locking the window against reversal.

18. A reversible window (1) according to any of the claims above, which is further provided with a locking fitting to retain the reversible window in the reversed position (cleaning position) to obviate the risk that the window will reverse again during the cleaning.

19. A reversible window (1) according to any of the claims above, wherein the frame (2) is provided with an indent for partial reception of the sash (3).

20. Use of a reversible window (1) according to any one of the preceding claims, **characterized in that** the frame part of the reversible window is placed closely up against the frame (2) of an adjacent window, such as a pivot-hung, tilting or reversible window or a fixed window.

21. A guide device (4) for a reversible window (1), the device (4) comprising a tension member (5) which is adapted at one end (5a) for pivotal connection with a frame (2), and a pressure rod (6) which is adapted at one end (6a) for pivotal connection with a sash (3) and is adapted at the other end (6b) for displaceable connection with the frame (2), the other end (5b) of the tension member being connected to the pressure rod (6) at a location between the ends (6a, 6b) of this rod, wherein the tension member (5) is substantially thinner than the pressure rod (6), and that preferably the thickness of the tension member (5) is not more than one third of the thickness of the pressure rod (6), **characterized in that** the tension member (5) has a thickness of less than 2 mm, preferably approximately 1.5 mm.

22. A guide device (4) according to claim 21, **characterized in that** the guide device (4) is an integral structure comprising of a rail (7) to which the other end (6b) of the pressure rod (6) is displaceably connected, and at the one end of which the first end (5a) of the tension member (5) is pivotally connected.

Revendications

1. Fenêtre réversible (1) comprenant un cadre (2) et un ouvrant (3) qui est de manière à pouvoir se déplacer et tourner relié à l'un bout au cadre (2), et un dispositif de guidage (4) comprenant un élément de tension (5) qui est à l'un bout (5a) relié à pivotement au cadre (2), et une tige à pression (6) qui est à l'un bout (6a) reliée à pivotement à l'ouvrant (3) près du centre de gravitation de celui-ci et à l'autre bout (6b) reliée au cadre (2), l'autre bout de l'élément de tension (5b) étant relié à la tige à pression (6) à un endroit entre les bouts (6a, 6b) de cette tige, **caractérisée en ce que** le dispositif de guidage (4) est monté sur la face (2a) du cadre (2).

2. Fenêtre réversible (1) selon la revendication 1, dans laquelle l'ouvrant (3) est dimensionné à cacher essentiellement le cadre (2).

3. Fenêtre réversible (1) selon la revendication 1 ou 2, dans laquelle la largeur du cadre correspond à celle de l'ouvrant plus l'épaisseur des deux éléments de tension.

4. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, dans laquelle l'élément de tension (5) et/ou le bord de l'ouvrant est pourvu d'un revêtement d'un matériau antifriction, tel que de téflon.

5. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, dans laquelle la fenêtre réversible comprend de la friction incorporée si bien que l'ouvrant peut être retenu dans toute position arbitraire.

6. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** la tige à pression (6) est composée d'une première portion (6') articulée à charnière au cadre (2) et d'une deuxième portion (6'') articulée à charnière à l'ouvrant (3), les deux portions (6', 6'') étant en liaison télescopique.

7. Fenêtre réversible (1) selon l'une quelconque des revendications 1-6, **caractérisée en ce qu'**à son autre bout (6b), la tige à pression (6) est de manière

à pouvoir se déplacer reliée au cadre (2).

8. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le dispositif de guidage (4) comprend également un rail (7) s'étendant le long de la face du cadre (2) essentiellement dans toute la longueur du cadre et recevant de manière à pouvoir se déplacer un élément d'engagement, tel qu'un tenon ou un sabot, relié à l'un bout de l'ouvrant (3).

9. Fenêtre réversible (1) selon la revendication 8, **caractérisée en ce que** le rail (7) reçoit de manière à pouvoir se déplacer l'autre bout (6b) de la tige à pression (6).

10. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** l'élément de tension (5) est essentiellement plus mince que la tige à pression (6).

11. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, dans laquelle l'élément de tension est un câble.

12. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, dans laquelle l'élément de tension est un élément de ruban avec une section légèrement en V.

13. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'**à ses côtés, l'ouvrant (3) est pourvu d'une bride (3') qui, dans une vue frontale de la fenêtre dans la position fermée, cache essentiellement la tige à pression (6).

14. Fenêtre réversible (1) selon l'une quelconque des revendications 8-13, **caractérisée en ce que** le rail (7) s'étend le long du bord extérieur du cadre (2).

15. Fenêtre réversible (1) selon l'une quelconque des revendications 8-14, dans laquelle le rail (7) est en U ayant l'ouverture en face de l'ouverture libre de la fenêtre.

16. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, conçue d'une telle manière que l'ouvrant (3) est caché par le cadre (2) dans une vue de l'intérieur.

17. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, étant également pourvue de moyens pour bloquer la fenêtre contre renversement.

18. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, qui est également pourvue d'une garniture de blocage pour retenir la fenêtre réversible dans la position renversée (la position de nettoyage) pour éviter le risque d'un nouveau renversement de la fenêtre lors du nettoyage.

19. Fenêtre réversible (1) selon l'une quelconque des revendications précédentes, dans laquelle le cadre (2) est pourvu d'un entaillage pour recevoir partiellement l'ouvrant (3).

20. Usage d'une fenêtre réversible (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la portion de cadre de la fenêtre réversible est arrangée étroitement contre le cadre (2) d'une fenêtre adjacente, telle qu'une fenêtre pivotante, basculante ou réversible ou une fenêtre fixée.

21. Dispositif de guidage (4) pour une fenêtre réversible (1), dispositif (4) qui comprend un élément de tension (5) qui est à l'un bout (5a) adapté à liaison à pivotement avec un cadre (2), et une tige à pression (6) qui est à l'un bout (6a) adaptée à liaison à pivotement avec un ouvrant (3) et est à l'autre bout (6b) adaptée à liaison avec le cadre (2) de manière à pouvoir se déplacer, l'autre bout (5b) de l'élément de tension étant relié à la tige à pression (6) à un endroit entre les bouts (6a, 6b) de cette tige, dans lequel l'élément de tension (5) est essentiellement plus mince que la tige à pression (6), et l'épaisseur de l'élément de tension (5) ne surpasse préférablement pas une moitié de celle de la tige à pression (6), **caractérisé en ce que** l'élément de tension (5) présente une épaisseur de moins de 2 mm, préférablement d'environ 1,5 mm.

22. Dispositif de guidage (4) selon la revendication 21, **caractérisé en ce que** le dispositif de guidage (4) est une construction d'une seule pièce comprenant un rail (7) auquel l'autre bout (6b) de la tige à pression (6) est relié de manière à pouvoir se déplacer, et à l'un bout duquel le premier bout (5a) de l'élément de tension (5) est relié à pivotement.

Patentansprüche

1. Umkehrfenster (1) umfassend einen Blendrahmen (2) und einen Flügelrahmen (3), der an seinen einem Ende verschiebbar und mit dem Blendrahmen (2) schwenkbar verbunden ist, und eine Führungsvorrichtung (4) mit einem Zugelement (5), das an einem Ende (5a) mit dem Blendrahmen (2) drehbar verbunden ist, und eine Zugstange (6), die an einem Ende (6a) mit dem Flügelrahmen (3) nahe dessen Schwerpunkt verbunden ist und an dem anderen Ende (6b) mit dem Blendrahmen (2) verbunden ist, wobei das andere Ende des Zugelements (5b) an einer Stelle zwischen den Enden (6a, 6b) der Zugstange (6) mit

dieser Stange verbunden ist, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (4) auf der Vorderseite (2a) des Blendrahmens (2) montiert ist.

2. Umkehrfenster (1) nach Anspruch 1, worin der Flügelrahmen (3) derart dimensioniert ist, dass er den Blendrahmen (2) im wesentlichen verdeckt.

3. Umkehrfenster (1) nach Anspruch 1 oder 2, wonach die Blendrahmenbreite der Flügelrahmenbreite plus der Dicke zweier Zugelemente entspricht.

4. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, worin das Zugelement (5) und/oder die Flügelrahmenkante mit einem Belag eines friktionsreduzierenden Materials, wie etwa Teflon, versehen ist.

5. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, worin das Umkehrfenster eingebaute Friktion aufweist, so dass der Flügelrahmen in jeder beliebigen Stellung festgehalten werden kann.

6. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Zugstange (6) aus einem mit dem Blendrahmen (2) scharnierverbundenen ersten Teil (6') und einem mit dem Flügelrahmen (3) scharnierverbundenen zweiten Teil (6'') besteht, welche beiden Teile (6', 6'') in Teleskopverbindung stehen.

7. Umkehrfenster (1) nach einem der Ansprüche 1-6, **dadurch gekennzeichnet, dass** die Zugstange (6) an seinem anderen Ende (6b) mit dem Blendrahmen (2) versetzbar verbunden ist.

8. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (4) ausserdem eine Schiene (7) umfasst, welche auf der Vorderseite des Blendrahmens (2) im wesentlichen dessen ganze Länge entlang verläuft und verschiebbar ein Eingriffsorgan, wie etwa einen Zapfen oder Schuh aufnimmt, der an das eine des Flügelrahmens verbunden ist.

9. Umkehrfenster (1) nach Anspruch 8, **dadurch gekennzeichnet, dass** die Schiene (7) verschiebbar das andere Ende (6b) der Zugstange (6) aufnimmt.

10. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Zugelement (5) wesentlich dünner als die Zugstange (6) ist.

11. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, wonach das Zugelement ein Draht ist.

12. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, wonach das Zugelement ein Streifenelement ist, das im Querschnitt eine leichte V-Form aufweist.

13. Umkehrfenster (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Flügelrahmen (3) an seinen Seiten mit einem Flansch (3') versehen ist, der in einer Vorderansicht des Fensters in dessen geschlossener Stellung die Zugstange (6) im wesentlichen verdeckt.

14. Umkehrfenster (1) nach einem der Ansprüche 8-13, **dadurch gekennzeichnet, dass** die Schiene (7) entlang der Aussenkante des Blendrahmens (2) verläuft.

15. Umkehrfenster (1) nach einem der Ansprüche 8-14, wonach die Schiene (7) eine U-Form aufweist und deren Öffnung der freien Öffnung des Fensters zuwendet.

16. Umkehrfenster (1) nach einem der obenstehenden Ansprüche, das derart ausgeformt ist, dass von innen gesehen der Flügelrahmen (3) durch den Blendrahmen (3) verdeckt ist.

17. Umkehrfenster (1) nach einem der obenstehenden Ansprüche, das ausserdem mit Mitteln zum Verschliessen des Fensters gegen ein Wenden versehen ist.

18. Umkehrfenster (1) nach einem der obenstehenden Ansprüche, das ferner mit einem Schliessbeschlag zum Festhalten des Umkehrfensters in Umkehrstellung (Reinigungsstellung) versehen ist, zur Vermeidung des Risikos, dass das Fenster unter dem Reinigen wiederum wendet.

19. Umkehrfenster (1) nach einem der obenstehenden Ansprüche, wonach der Blendrahmen (2) mit einer Einkerbung zur teilweisen Aufnahme des Flügelrahmens (3) versehen ist.

20. Verwendung eines Umkehrfensters (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Blendrahmenteil des Umkehrfensters in der Nähe des Blendrahmens (2) eines benachbarten Fensters, wie etwa eines drehbar aufgehängten Fensters, Kippfensters oder Umkehrfensters oder eines festen Fensters platziert ist.

21. Führungsvorrichtung (4) für ein Umkehrfenster (1), welche Vorrichtung (4) umfasst: ein Zugelement (5), das an einem Ende (5a) für drehbare Verbindung mit dem Blendrahmen (2) eingerichtet ist, und eine Zugstange (6), die an einem Ende (6a) für drehbare Verbindung mit dem Flügelrahmen (3) und an dem anderen Ende (6b) für versetzbare Verbindung mit

dem Blendrahmen (2) eingerichtet ist, wobei das andere Ende (5b) des Zugelements mit der Zugstange (6) an einer Stelle zwischen den Enden (6a, 6b) dieser Stange verbunden ist, und das Zugelement (4) wesentlich dünner als die Zugstange (6) ist, und dass die Dicke des Zugelements (5) vorzugsweise nicht mehr als ein Drittel der Dicke der Zugstange (6) beträgt, **dadurch gekennzeichnet, dass** das Zugelement (5) eine Dicke von weniger als 2 mm, vorzugsweise etwa 1,5 mm aufweist.

22. Führungsvorrichtung (4) nach Anspruch 21, **dadurch gekennzeichnet, dass** die Führungsvorrichtung (4) eine integrale Konstruktion ist umfassend eine Schiene (7), mit welcher das andere Ende (6b) der Zugstange (6) verschiebbar verbunden ist, und an deren einem Ende das erste Ende (5a) des Zugelements (5) drehbar verbunden ist.

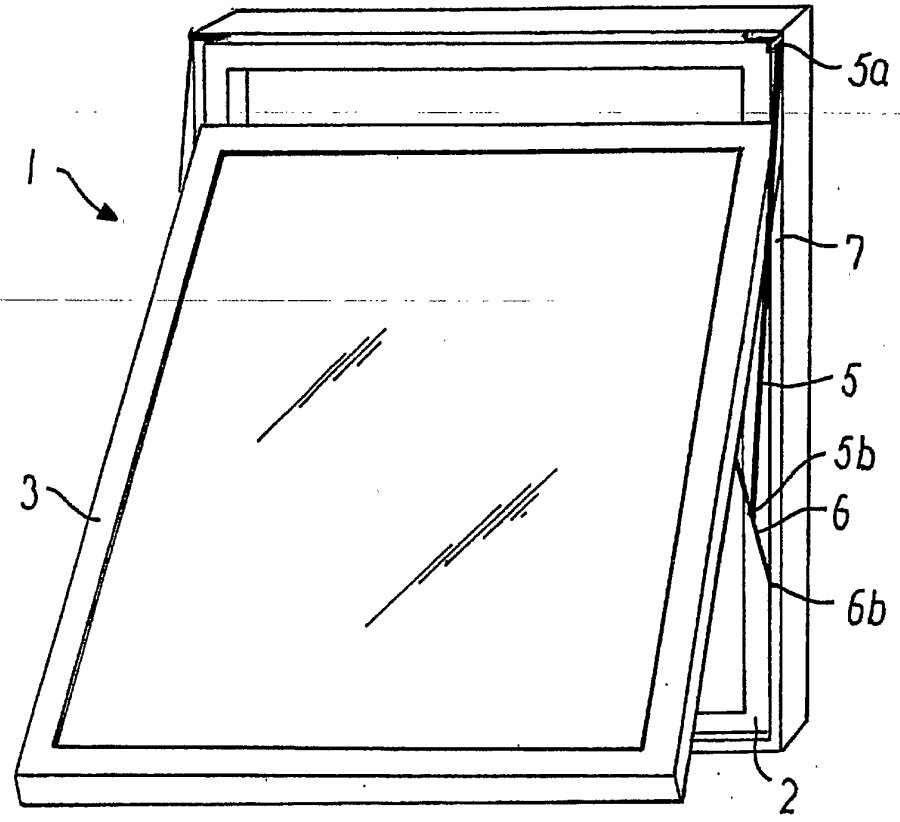


FIG.1

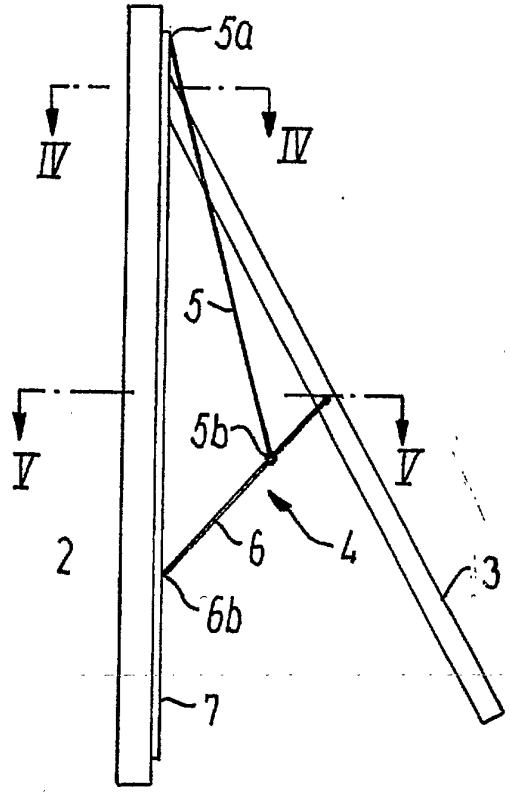


FIG.2

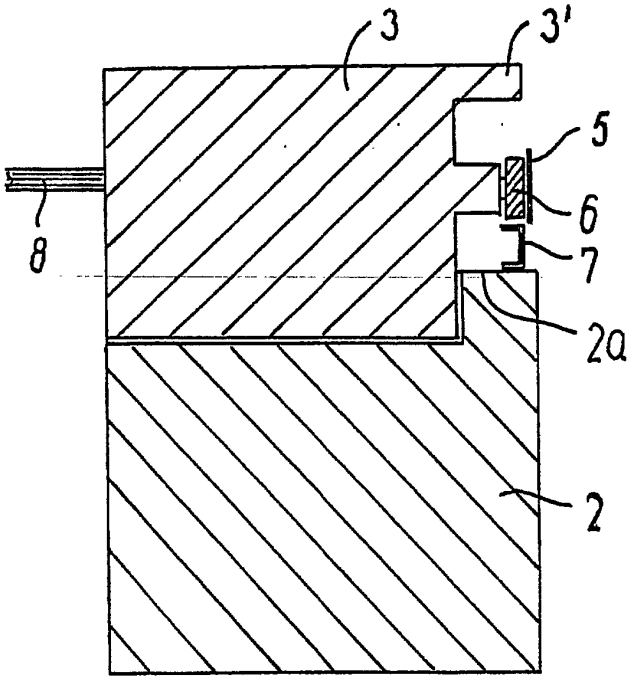


FIG. 3

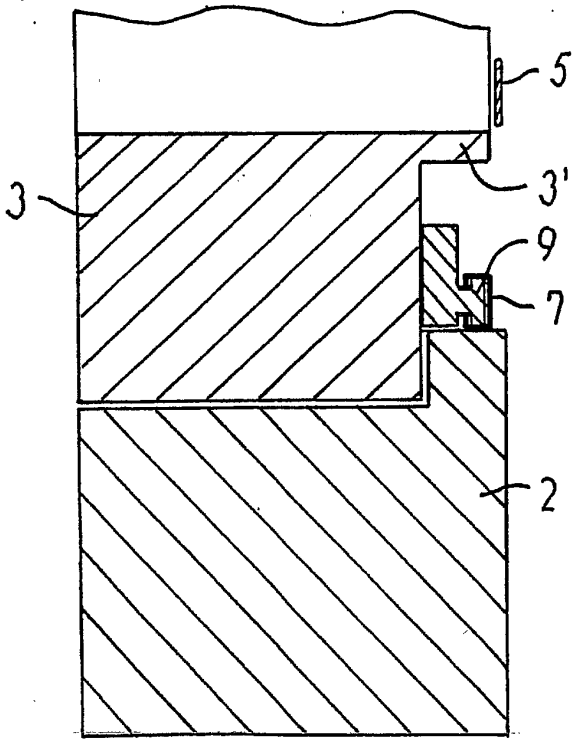


FIG. 4

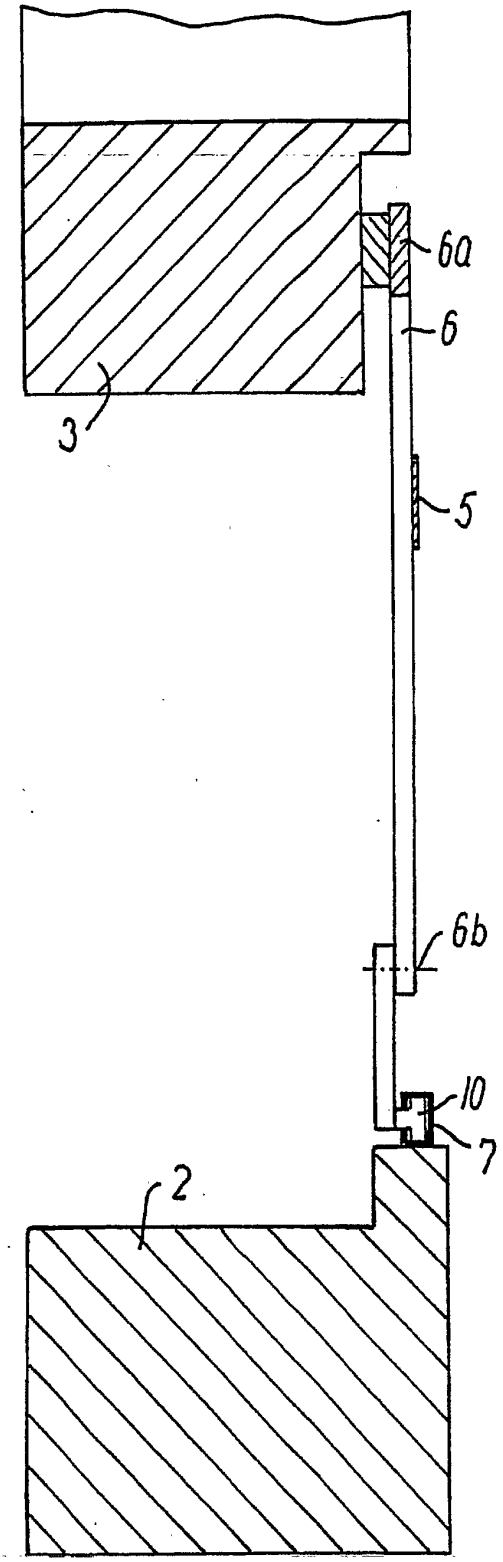


FIG. 5