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(54) **WINDOW CONSTRUCTION PREFERABLY FOR INSTALLATION IN A PITCHED ROOF**
FENSTERKONSTRUKTION, VORZUGSWEISE ZUR INSTALLATION IN EINEM GENEIGTEN DACH
FENETRE A INSTALLER DE PREFERENCE DANS UN TOIT EN PENTE

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(73) Proprietor: **VKR Holding A/S
2970 Hørsholm (DK)**

(72) Inventors:
• **ANDERSEN, Torben, Peter
DK-4000 Roskilde (DK)**

- **LINDGREN, Claes
DK-3520 Farum (DK)**
- **HANSEN, Claus, Grummesgaard
DK-2500 Valby (DK)**
- **VIGENBERG, Stig, Flemming
DK-3250 Gilleleje (DK)**

(74) Representative: **Carlsson, Eva
Awapatent A/S
Rigensgade 11
1316 Copenhagen K (DK)**

(56) References cited:
**EP-A1- 0 519 197 DE-A1- 19 607 931
DE-B- 1 187 951 DK-B- 139 822**

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Description

[0001] The present invention relates to a window construction preferably for installation in a pitched roof, which window construction comprises a frame with a top frame member, a bottom frame member and two frame side members, and a sash with a top sash member, a bottom sash member and two sash side member, which frame and sash in mounted state are mutually hingedly connected to form an axis of rotation along a frame side member, as between the frame and sash parts, one or more hinges are provided each with two hinge portions, of which the first hinge portion of each hinge in said mounted state is connected to a slash part and the second hinge portion to a frame portion.

[0002] Compared to common roof windows with horizontal pivot axis, the said window construction is advantageous in the situations where the window is to be used as access to a roof, e.g. for craftsmen such as roofers and chimney sweepers, or as emergency exit in case of fire.

[0003] However, it is an inconvenience that production and stocking have to be made of windows which open to the one side and the other side, respectively, as demands are made for both kinds of window construction. In general, this depends essentially on the positioning of the chimney or chimneys in relation to the roof exit, but may be due to the fact that the window is to be mounted close to a roof edge or another window, and the window must therefore be openable in a way that provides the possibility for a secure and easy access to the roof. Some solutions for flexibly openable windows are shown e.g. in EP-A-0519197 and DK-B-139822. EP-A-0519197 can be seen as the closest prior art.

[0004] An object of the invention is to provide a window construction which does not have above inconvenience and which at the same time is simple to construct and to mount.

[0005] With this object, the window construction according to the invention is characterized in that the second hinge portion is designed for releasable engagement with retaining means arranged at an optional frame member, at least two frame members being provided with or prepared for such retaining means.

[0006] It is thus obtained that the window construction in a simple way can be assembled as to open to either the one or the other side. Only one type of window is required resulting in substantial savings, as there is no need to produce and stock two types of windows, and the risk of faulty delivery regarding right-hinged and left-hinged window is eliminated. Furthermore, it will be possible to modify the hinge axis of a mounted window, if it is subsequently found to be more appropriate.

[0007] According to an embodiment, the hinge or hinges are arranged between the sash and frame side members, permitting a relatively discreet construction as the window construction can be formed such that the hinge or hinges are hidden or essentially hidden in both the

closed and open position of the window.

[0008] In an alternative embodiment, the hinge or hinges are arranged between respective top and bottom members of frame and sash, respectively, which permits a stronger hinge construction such that the hinge or hinges can support a relatively large and heavy window, in particular as the hinge portions can extend far from the hinge axis.

[0009] In a further development of the window construction, the connection between the first hinge portion and the sash side member is also releasable, more sash members being provided with retaining means for said first hinge portion. Both the connection between the second portion and the frame member and the connection between the first hinge portion and the sash member thus being made releasable, the exchange of the hinge axis from the one to the other frame and sash side can be effected without turning the sash, which is an advantage, e.g. if the window construction is already mounted in the roof.

[0010] The window construction can further comprise a lifting device acting on the sash and being connected to a frame member, preferably releasably secured to a frame side member, thus facilitating the opening and closing of the window, as at least a part of the frame and pane weight is counterbalanced by the lifting force of the lifting device. Such a lifting device contributes to maintaining the force required to be applied on the sash by the user to open the window at a moderate level such that physically weak or weakened persons are not prevented opening the window. By securing the lifting device releasably to a frame side member, as described, it is still possible to easily change the hinge axis from being parallel with one frame side member to be parallel with the other frame side member.

[0011] The lifting device can e.g. be constituted by any appropriate kind of spring, such as a gas spring or a coil spring, however, in a particularly simple embodiment, the lifting device is a spring wire bent essentially in a Y-shape which at its central leg is secured to a frame side member, and the two branches extend along the frame side member and are bent at the ends in order to in an unloaded position be directed essentially perpendicular outward from the plane of the frame. The ends of the spring wire abut on the sash and affect this in the opening direction, the spring wire functioning as a torsion spring with maximal spring force at closed window which decreases to zero at fully opened window. This lifting device is discreet, simple and inexpensive.

[0012] A particularly simple mounting of a lifting device can be obtained in that the frame side members are provided with one or more retaining means for the lifting device. The frame side members being thus provided with retaining means, the lifting device is very easy to mount and very easy to move.

[0013] The frame comprises preferably means for torque transferring guidance of the lifting device, an advantageous weather strip pressure being obtainable in

the closed position of the window.

[0014] According to an embodiment, the window construction further comprises a linkage element arranged between a frame member and a sash member, the linkage element being adapted for releasable connection with frame and/or sash. The linkage element permits the window to be kept in an open position, and the releasable connection between the linkage element and the frame and/or the sash permits the linkage element to be disengaged in a simple manner, e.g. if the hinge axis is to be displaced to the other frame side member.

[0015] According to an embodiment, the window construction is characterized in that the linkage element is an articulation, preferably a toggle joint, which is adapted for locking in the fully extended position of the articulation, corresponding to a maximal opening of the window. The window is thus prevented from being opened too much and thus damaging the hinges, the sash and/or the frame. At the same time, the locking effect assures that the window does not slam after being opened to the fully opened position. Since the window may thus be left in fully open position, there is no risk of e.g. the window slamming after a person has entered the roof.

[0016] Furthermore, the window construction can comprise a control device connected to a sash member or a pane mounted in the sash, which device is adapted for cooperation with an engagement means mounted on the frame. The device can be a handle, an arm or a hasp providing the user with a good grip of the window during the opening movement, and also can be used for locking of the window in closed position or retaining of the window in a somewhat open ventilation position.

[0017] The window can comprise separate lifting device and linkage element, however, in a particularly simple embodiment, the window construction is characterized in that the linkage element also constitutes the lifting device. This can e.g. be obtained in that the lifting device is a gas spring provided with an external case sliding outside the gas cylinder and in the fully opened position of the window abuts on the end of the gas cylinder and thus prevents compression.

[0018] According to an aspect of the invention, the window construction is characterized in the sash and the frame are arranged so that the sash may optionally be connected to the frame for pivoting about an axis along one frame side member or the other frame side member, the sash and the frame being adapted for mutual connection or disconnection, together with possible connecting elements. This aspect assures a substantial saving when mounting the window which can be effected rapidly and efficiently, and in particular the hinge axis can at the mounting or later optionally be arranged to extend along one or the other frame side member.

[0019] In the following, the invention will be described in more detail by means of an embodiment and with reference to the accompanying drawing, where

construction according to the invention,

Fig. 2 is a cross-section of the frame side member to which a sash side member is hingedly connected according to a first embodiment,

Fig. 3 is a view from the side of the frame side member in Fig. 2,

Fig. 4 is a view from above of the frame side member in Fig. 3,

Fig. 5 is a view of a reception means for a hinge,

Fig. 6 is enlarged view corresponding to fig. 2,

Fig. 7 is a section of the opposite frame side member, Fig. 8 is a side view of the frame side member in Fig. 7,

Fig. 9 is a part of a sash member,

Fig. 10 is a cross-section of the sash member corresponding to Fig. 9,

Fig. 11 is a view corresponding to Fig. 9 with a mounted linkage element,

Fig. 12 is a view of a portion of the frame and the sash with hinge connection according to a second embodiment of the invention,

Fig. 13 is a view of a hinge connection according to the second embodiment comprising a linkage element, and

Fig. 14 is a view of a hinge portion comprising guides for a lifting device.

[0020] Fig. 1 shows the window construction 1 according to the invention. The window construction comprises a frame 2 with a top frame member 3, a bottom frame member 4 and two frame side members 5, 6 and a sash 7 with a top sash member, a bottom sash member 9 and two frame side members 10, 11. The referential number 16 indicates a linkage mechanism which, in the embodiment, is placed at the top frame member 3, which is preferred in the cases where the window must be usable as an exit. If the window is not to be used as an exit, it may be appropriate to arrange the linkage mechanism 16 at the bottom frame member 4 as in particular with highly placed windows it may otherwise be difficult to reach the linkage mechanism 16 when this is necessary.

[0021] Fig. 2 illustrating a first embodiment of the invention shows a cross-section through the frame side member 6 and the sash side member 11 in a position where the frame is in its fully opened position. The frame side member 6 and the sash side member 11 are as shown connected by a hinge 12 with two hinge portions 13, 14 of which the first hinge portion 13 is connected to the sash side member 11 and the second hinge portion 14 is connected to the frame side member 6. In the sash 7, a pane 17 is installed, and the figure also shows a lifting device 19 in the form of spring wire bent in such an angle that one leg extends along the frame side member 6 and one leg is pressed against the pane 17 or the sash 7. The spring wire may advantageously run in guides at the sash such that the spring wire can transfer torque to the sash such that the spring wire influences the sash with a weather strip pressure in the closed po-

Fig. 1 is a view obliquely from below of a window

sition of the window.

[0022] Correspondingly, Fig. 3 shows the frame side member 6 in a side view, the sash 7 being removed in order to show more clearly the lifting device 19. As it appears, the lifting device 19 is a wire bent to a shape as an open Y where two branches project upward at the ends of the frame side member 6 to which the wire is kept in retaining means 22, whereas the rest of the wire extends along the frame side member 6 to which the wire, in the shown example is secured in the middle in a retaining means 21. A lifting device is thus obtained in a simple manner, the wire being in the closed position of the window twisted on the portion extending along the frame side member 6. In positions where the window is not fully open, the spring wire thus affects the sash in the opening direction. A counterbalance is thus obtained of the effect from gravity on the sash such that the window will be easier to open and correspondingly the lifting device counteracts that the window slams during closing.

[0023] In Fig. 4, the frame side member 6 is seen from above, and it can be seen that the spring wire extends along the frame side member 6.

[0024] A combined fitting for mounting on a frame side member, the fitting comprising retaining means 15 for a hinge portion 14 and a retaining means 22 for the spring wire constituting the lifting device 19, is seen in Fig. 5. The fitting can be secured to the frame side member by e.g. screws, rivets or adhesive.

[0025] It is observed that the hinges 12 in the shown embodiment of the window construction are connected to the frame 2 and the sash 7, respectively, in that the second portion 14 of each of e.g. two hinges is releasably connected to the retaining means 15 on the frame side member 6, whereas the first hinge portion 13 is fixedly connected to the sash side member 11. Obviously, the sash side members 11 and 10 might instead or likewise be provided with retaining means for the first hinge portion 13.

[0026] Fig. 6 is an enlargement of a cross-section through the frame side member 6 and the sash side member 11. Here, it is more clearly than in Fig. 2 how the hinge portion 14 is inserted in the retaining means 15, whereas the hinge portion 13 in this embodiment as mentioned in the above is fixedly connected to the sash side member 11. In this figure, the lifting device is not shown for the sake of clearness. In the shown example, the hinge portion 14 is an insertion hinge having a resilient flap which in a way not shown in detail enters in engagement with the upper edge on the retaining means 15 such that the hinge portion 14 cannot immediately be withdrawn from the retaining means 15. If the hinge portion is to be removed from the retaining means 15, the resilient flap must be bent away from the frame side member 6 such that the flap avoids the upper edge of the retaining means, which in most cases is feasible without use of tools. Assembling and separation may thus be effected rapidly and efficiently, and without tools which the assembler otherwise risks to forget or lose. Furthermore,

it is an advantage of such insertion hinges that they create no perforation in the covering or frame side which could result in moisture penetration. If a particular protection against removal of the hinge portion 14 from the retaining means 15 is desired, e.g. a screw or the like may, however, be provided through the retaining means 15 and the hinge portion 14. As an alternative to a insertion hinge, the retaining means can be threaded pins, above which the hinge portion 14 is mounted and fastened by means of a wing nut or the like. Vice versa, the retaining means can be a hole in the frame side member, in which a bolt or a screw can be screwed.

[0027] A cross-section through the second frame side member 5 and corresponding sash side member 10 is seen in Fig. 7 which also shows a control device 18 means for cooperation with a pin 20 on the frame side member 5. In the illustration, the window is shown in a slightly open ventilation position. In the preferred embodiment, the control device 18 is fixedly connected to the pane 17 and/or the sash side member 10, e.g. by adhesion and riveting. In the figure, the control device 18 is shown as a flat strip, however, the control device 18 can obviously be preferably provided with a more or less ergonomic handle such that the user is sure to get a good grip on the control device 18. Thus, it will also be obvious that the control device 18 can comprise several parts, such as a first metal strip connected to sash and/or pane and hingedly connected to the second metal strip hingedly connected to an arm. The double arrow indicates that the control device 18 is hinged so that it can be moved from or against the frame side member 5, in order to assure that the control device 18 can be moved for engagement with or out of engagement with the pin 20, the control device 18 being provided with one or more not shown holes for engagement with the pin 20.

[0028] An illustration seen from the clearance of the frame towards the frame side member 5 is shown in fig. 8. In the figure, the control device 18 is seen with said holes for engagement with the pin 20 which is in this figure covered by the device. As indicated with double arrows, the control device 18 can be hinged in order to be pivoted to a position essentially parallel to the frame side member 5. The control device 18 can at the hinge axis appropriately be provided with an oblong hole which, in the closed position of the window abuts eccentrically on the portion of the hole opposite the sash and farthest away from the centre axis, and when turning the control device 18, it is obtained that the sash 7 is drawn toward the frame 2 because the pin is drawn closer to the centre axis of the hole. Of course, the kinematically opposite situation is also possible where one or more pins are provided on the control device and a hole is provided in the frame 2.

[0029] Figs. 9, 10 and 11 are illustrations of a part of the top sash member 8 at the position where a possible linkage mechanism 16 is secured to the sash member 8. Fig. 9 is an illustration from the interior side of the sash where it is seen that in the edge of the sash member 8,

a semicircular cut is provided, and a mounted spring plate 23 is indicated, which is more easy to see in combination with Fig. 10. Fig. 10 is cross-section through the sash member 8, and it can be seen that the spring plate 23 comprises an upright flap 24. Finally, Fig. 11 shows how the linkage element 16 can be connected to the top sash member 8, the linkage element 16 being hingedly connected to a shoe which, in the mounted position is retained by the cut against displacement along the sash member 8, is retained against displacement away from the cut of the upright flap 24 of the spring plate 23, and at the same time is retained by the bent edge of the sash side member 8.

[0030] Even though the linkage element in the shown embodiment is connected to the top sash member, it is possible to move the connecting point from the top sash member to the bottom sash member, just as it will be possible to place the connection at one or the other sash side member.

[0031] An appreciable aspect of the invention is that the window construction before, during or after the installation in a roof construction can be changed from having a hinge axis along one side edge to have a hinge axis along another side edge. In the shown embodiment, it may in practice be effected in the way that the window is opened and a possible linkage mechanism 16 is released from the top sash member 8 by the flap being pressed down and the shoe of the linkage mechanism being withdrawn from the bent edge of the sash member. In the fully open position of the window, the hinge portions 14 are released from the retainers 15, such that the sash 7 can be removed from the frame 2. If a lifting device 19 has been mounted, it is removed at the same time from the frame side member 6 by withdrawal of the spring wire out of engagement with the retainers 21 and 22 on the frame side member 6. Subsequently, the lifting device is mounted in corresponding retainers on the opposite frame side member 5. The sash with device 18 is turned 180° and the hinge portions 14 are inserted in retainers 15 on the frame side member 5. Now only remains to connect the linkage mechanism 16 to the sash member 9 which is now the top sash part and to displace the possible pin 20 from the frame side member 5 to the opposite frame side member 6. If the hinge portions 14 are releasably connected to both the frame side member 6 and the sash side member 11, the hinge portions can be released from both members and inserted in the retainers 15 on the opposite frame side member 5 and not-shown retainers on the opposite sash side member 10, as it is thus unnecessary to turn the sash 180°. In this case it is not necessary to displace the linkage mechanism, however, it will often be necessary to displace the control device 8 and the engagement means 19. As it appears, the hinge axis can be changed without using tools, which eliminates the risk that the installer has forgotten, mislaid or lost mounting means or tools, and the inconveniences and dangers involved.

[0032] Another embodiment is shown in Fig. 12 which

for the sake of clarity shows the second hinge portion 14 separated from the frame member 3. The figure shows a portion of the top frame member 3 with retaining means 15 in the form of pins which can appropriately be provided with a head. A first hinge portion 13 is secured to a top sash member 8 and hingedly connected to a second hinge portion 14. The second hinge portion 14 is provided with cutouts 15a for reception of the retaining means 15. The engagement between the hinge portion 14 and the frame portion 3 can in a way not shown in detail be self-locking, e.g. in that the hinge portion 14 or the frame member 3 are provided with a resilient flap permitting displacement of the hinge portion 14 to the mounting position, but preventing displacement of the hinge portion away from the mounting position. As an alternative or a supplement, the hinge portion 14 can as indicated be fixed to the frame member 3 by means of e.g. a screw or a bolt (not-shown) via a hole 25 in the hinge portion 14 and a corresponding hole 26 in the frame member 3 where the hole 26 might be provided with a thread.

[0033] As shown in fig. 13, the hinge construction according to this embodiment can be combined with a linkage element 16, such that the two hinge portions 13, 14 are connected via e.g. a toggle mechanism comprising a first member 27 and a second member 28, as shown. The hinge 12 and the linkage element 16 can thus be a unit construction delivered assembled, which besides the obvious advantage that only one part is to be fixed to frame and sash, has also the advantage that the mounting of the sash to the frame is facilitated, the second hinge portion 14 being retained in relation to the sash and further the linkage element preventing sash from being overturned during mounting, which reduces the risk of damaging the frame, sash and hinges during mounting. By the shown shape of the second hinge portion 14, the mounting of the sash can be effected in a simple manner as the cut-out 15a on the outer end of the hinge portion is placed above the corresponding pin 15 on the frame, and the hinge portion 14 is tilted downward for engagement between the second cut-out 15a and the second pin 15, this engagement assuring against further turning in this direction. Combined with the linkage element 16, the hinge construction can in the shown position receive the loads and torque from the sash caused by the mass hereof, such that the sash is in balance and in this position, the hinge portion can therefore without difficulties be fixed, e.g. by means of a screw or a bolt, as mentioned above.

[0034] With reference to Fig. 14, the hinge portion 13 can appropriately be provided with guides 29 for a spring wire constituting the lifting device. It is thus obtained that the force from the lifting device is received by the hinge portion, the pane, its securing, and weather strips between pane and sash etc. being more or less relieved from this force. The pane can e.g. be secured to the sash by means of a silicone mass which can be sensitive to compressive stress. The guides 29 for the spring wire permit further that the spring wire can transfer a torque

to the hinge portion 13 and thus to the sash, such that the sash in closed position can be subjected to a torque which affects the sash in the closing direction in order to increase the weather strip pressure between the sash/pane and the frame.

[0035] It is obvious that in the window construction, a combination can be used of one or more hinges at side members of the construction and one or more hinges at top and/or bottom members of the construction.

[0036] Furthermore, one or two linkage elements can be used, preferably mounted between top frame and sash members. If a linkage element is mounted between bottom frame and sash members, it is preferred that the element is mounted as close to the hinge axis as possible in order to assure least possible reduction of the exit for a person entering and leaving through the window.

[0037] It is to be understood that the frame of the window construction can e.g. be produced by pressing or deep drawing from a metal sheet which also constitutes a flashing. The frame can thus consist of pressed up edges of the metal sheet, such that the frame is not constructed by e.g. wooden parts to form a separate unit, as window constructions have conventionally been constructed. Such a frame can additionally be provided with e.g. insulating materials and/or wooden panels or the like for insulation and/or for aesthetic reasons.

[0038] Furthermore, it should be noted that the retaining means do not necessarily have to be provided on a frame member as the retaining means can be arranged on or at the flashing at a distance from the frame.

[0039] The window construction is preferably for installation in a pitched roof, but can further be used in a façade or another construction part. The expression window construction is to be understood widely, as the window is not necessarily provided with a pane, but e.g. instead of a plate, such as a hatch or a door.

Claims

1. A window construction (1) preferably for installation in a pitched roof, which window construction (1) comprises a frame (2) with a top frame member (3), a bottom frame member (4) and two frame side members (5, 6), and a sash (7) with a top sash member (8), a bottom sash member (9) and two sash side members (10, 11), which frame (2) and sash (7) in mounted state are mutually hingedly connected to form an axis of rotation along one of the two frame side members (5, 6), one or more hinges (12) being provided between the frame and sash members (3, 4, 5, 6; 8, 9, 10, 11), each hinge having two hinge portions (13, 14), of which the first hinge portion (13) of each hinge (12) in said mounted state is connected to a sash member (8, 9, 11, 10) and the second hinge portion (14) to a frame member (3, 4, 6, 5), **characterized in that** the second hinge portion (14) is designed for releasable engagement with retaining

means (15) arranged at a frame member (3, 4, 5, 6), at least two frame members (3, 4, 5, 6) being provided with such retaining means (15), such that the axis of rotation can optionally be arranged to extend along one or the other frame side member.

2. A window construction (1) according to claim 1, **characterized in that** the hinge or hinges (12) are arranged between the sash and frame side members (10, 11; 5, 6).
3. A window construction (1) according to claim 1, **characterized in that** the hinge or hinges (12) are arranged between respective top and bottom members of frame and sash, respectively.
4. A window construction (1) according to any of the preceding claims, **characterized in that** the connection between the first hinge portion (13) and the sash member (8, 9, 10, 11) is also releasable, one or more sash members (8, 9, 10, 11) being provided with retaining means for said first hinge portion (13).
5. A window construction (1) according to any of the preceding claims, **characterized in** comprising a lifting device (19) acting on the sash and being connected to a frame member (8, 9, 10, 11), preferably releasably secured to a frame side member (10, 11).
6. A window construction (1) according claim 5, **characterized in that** the lifting device (19) is a spring wire bent essentially in a Y-shape which at its central leg is secured to a frame side member, and the two branches extend along the frame side member and are bent at the ends in order to in an unloaded position be directed essentially perpendicularly outward from the plane of the frame.
7. A window construction (1) according claim 5 or 6, **characterized in that** the frame side members (5, 6) are provided with one or more retaining means (21, 22) for the lifting device (19).
8. A window construction (1) according to any of the claims 5-7, **characterized in that** the sash comprises means for torque transferring guidance of the lifting device.
9. A window construction (1) according to any of the preceding claims, **characterized in that** the window construction (1) further comprises a linkage element (16) arranged between a frame member (3, 4, 5, 6) and a sash member (8, 9, 10, 11), the linkage element (16) being adapted for releasable connection with frame and/or sash.
10. A window construction (1) according claim 9, **characterized in that** the linkage element (16) is an ar-

tication, preferably a toggle joint, which is adapted for locking in the fully extended position of the articulation, corresponding to a maximal opening of the window.

11. A window construction (1) according to any of the claims 9-10, **characterized in that** the linkage element (16) also constitutes the lifting device (19).
12. A window construction (1) according to any of the preceding claims, **characterized in that** the window construction (1) comprises a control device (18) connected to a sash member (8, 9, 10, 11) or a pane (17) mounted in the sash (7), which device is intended for cooperation with an engagement means (20) mounted on the frame (2).
13. A window construction (1) according to any of the preceding claims, **characterized in that** the sash (7) and the frame (2) are arranged so that the sash (7) may optionally be connected to the frame (2) for pivoting about an axis along one frame side member (5) or the other frame side member (6), the sash (7) and the frame (2) being adapted for mutual connection or disconnection, together with possible connecting elements (16, 18, 19).

Patentansprüche

1. Fensteraufbau (1), vorzugsweise zum Einbau in ein geneigtes Dach, wobei der Fensteraufbau (1) einen Rahmen (2) mit einem oberen Rahmenelement (3), einem unteren Rahmenelement (4) und zwei Rahmenseitenelementen (5, 6) und einen Flügel (7) mit einem oberen Flügelelement (8), einem unteren Flügelelement (9) und zwei Flügelseitenelementen (10, 11) umfasst, wobei der Rahmen (2) und der Flügel (7) im montierten Zustand gegeneinander schwenkbar verbunden sind, wobei eine Drehachse entlang eines der zwei Rahmenseitenelemente (5, 6) gebildet wird, wobei ein oder mehrere Gelenke (12) zwischen den Rahmen- und Flügelelementen (3, 4, 5, 6; 8, 9, 10, 11) vorgesehen sind, wobei jedes Gelenk zwei Gelenkabschnitte (13, 14) aufweist, von denen der erste Gelenkabschnitt (13) jedes Gelenks in dem montierten Zustand mit einem Flügelelement (8, 9, 11, 10) und der zweite Gelenkabschnitt (14) mit einem Rahmenelement (3, 4, 6, 5) verbunden ist, **dadurch gekennzeichnet, dass** der zweite Gelenkabschnitt (14) für einen lösbaren Eingriff mit Haltemitteln (15) ausgestaltet ist, die an einem Rahmenelement (3, 4, 5, 6) angeordnet sind, wobei wenigstens zwei Rahmenelemente (3, 4, 5, 6) mit solchen Haltemitteln (15) versehen sind, so dass die Drehachse wahlweise so angeordnet werden kann, dass sie entlang des einen oder des anderen Rahmenseitenelements verläuft.
2. Fensteraufbau (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Gelenk oder die Gelenke (12) zwischen den Flügel- und Rahmenseitenelementen (10, 11; 5, 6) angeordnet sind.
3. Fensteraufbau (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Gelenk oder die Gelenke (12) zwischen entsprechenden oberen bzw. unteren Elementen des Rahmens und Flügels angeordnet sind.
4. Fensteraufbau (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Verbindung zwischen dem ersten Gelenkabschnitt (13) und dem Flügelelement (8, 9, 10, 11) auch lösbar ist, wobei eines oder mehrere Flügelelemente (8, 9, 10, 11) mit Haltemitteln für den ersten Gelenkabschnitt (13) versehen sind.
5. Fensteraufbau (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** ein Hebeelement (19) vorgesehen ist, das auf den Flügel einwirkt und mit einem Rahmenelement (8, 9, 10, 11) verbunden ist, vorzugsweise lösbar an einem Rahmenseitenelement (10, 11) befestigt ist.
6. Fensteraufbau (1) nach Anspruch 5, **dadurch gekennzeichnet, dass** das Hebeelement (19) ein Federdraht ist, der im Wesentlichen in eine Y-Form gebogen ist, die mit ihrem zentralen Bein an einem Rahmenseitenelement befestigt ist und wobei sich die zwei Arme entlang des Rahmenseitenelements erstrecken und an den Enden gebogen sind, um in einer unbelasteten Stellung im Wesentlichen senkrecht nach außen aus der Ebene des Rahmens herausgerichtet zu sein.
7. Fensteraufbau (1) nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** die Rahmenseitenelemente (5, 6) mit einem oder mehreren Haltemitteln (21, 22) für das Hebeelement (19) versehen sind.
8. Fensteraufbau (1) nach einem der Ansprüche 5 bis 7, **dadurch gekennzeichnet, dass** der Flügel Mittel zur Führung zum Übertragen eines Drehmoments des Hebelements aufweist.
9. Fensteraufbau (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Fensteraufbau (1) ferner ein Kopplungselement (16) aufweist, das zwischen einem Rahmenelement (3, 4, 5, 6) und einem Flügelelement (8, 9, 10, 11) angeordnet ist, wobei das Kopplungselement (16) für eine lösbare Verbindung mit dem Rahmen und/oder dem Flügel angepasst ist.
10. Fensteraufbau (1) nach Anspruch 9, **dadurch gekennzeichnet, dass** das Kopplungselement (16) ei-

ne Gelenkverbindung, vorzugsweise eine Kniehebelverbindung, ist, die zum Verriegeln in einer vollständig ausgefahrenen Position der Gelenkverbindung angepasst ist, die einer maximalen Öffnung des Fensters entspricht.

11. Fensteraufbau (1) nach einem der Ansprüche 9 bis 10, **dadurch gekennzeichnet, dass** das Koppelungselement (16) auch das Hebeelement (19) umfasst.
12. Fensteraufbau (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Fensteraufbau (1) eine Steuereinrichtung (18) aufweist, die mit einem Flügelement (8, 9, 10, 11) oder einer in dem Flügel (7) angebrachten Fensterscheibe (17) verbunden ist, wobei die Einrichtung für ein Zusammenwirken mit einem Eingriffselement (20), das an dem Rahmen (2) angebracht ist, vorgesehen ist.
13. Fensteraufbau (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Flügel (7) und der Rahmen (2) so angeordnet sind, dass der Flügel (7) optional mit dem Rahmen (2) zum Schwenken um eine Achse entlang des einen Rahmenseitenelements (5) oder des anderen Rahmenseitenelements (6) verbunden werden kann, wobei der Flügel (7) und der Rahmen (2) für eine gegenseitige Verbindung oder ein Lösen zusammen mit den möglichen Verbindungselementen (16, 18, 19) angepasst sind.

Revendications

1. Construction de fenêtre (1) à installer, de préférence, dans un toit en pente, laquelle construction de fenêtre (1) comprend un châssis (2) doté d'un élément de châssis supérieur (3), d'un élément de châssis inférieur (4) et de deux éléments de châssis latéraux (5, 6), et d'un cadre (7) comportant un élément de cadre supérieur (8), un élément de cadre inférieur (9) et deux éléments de cadre latéraux (10, 11), lesquels châssis (2) et cadre (7), dans l'état monté, sont raccordés mutuellement de façon articulée afin de former un axe de rotation le long de l'un des deux éléments latéraux de châssis (5, 6), une ou plusieurs articulation(s) (12) étant prévue(s) entre les éléments de châssis et de cadre (3, 4, 5, 6 ; 8, 9, 10, 11), chaque articulation comportant deux parties d'articulation (13, 14), dont la première partie d'articulation (13) de chaque articulation (12), dans ledit état monté, est raccordée à un élément de cadre (8, 9, 11, 10) et la seconde partie d'articulation (14) à un élément de châssis (3, 4, 6, 5), **caractérisée en ce que** la seconde partie d'articulation (14) est conçue en vue d'un engagement libérable avec des

moyens de retenue (15) agencés au niveau d'un élément de châssis (3, 4, 5, 6), au moins deux éléments de châssis (3, 4, 5, 6) étant équipés de ces moyens de retenue (15), de telle sorte que l'axe de rotation peut, facultativement, être agencé pour s'étendre le long de l'un ou de l'autre élément latéral du châssis.

2. Construction de fenêtre (1) selon la revendication 1, **caractérisée en ce que** l'articulation ou les articulations (12) est (sont) disposée (s) entre les éléments latéraux de cadre et de châssis (10, 11 ; 5, 6).
3. Construction de fenêtre (1) selon la revendication 1, **caractérisée en ce que** l'articulation ou les articulations (12) est (sont) agencée(s) entre les éléments supérieurs et inférieurs respectifs du châssis et du cadre, respectivement.
4. Construction de fenêtre (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le raccordement entre la première partie d'articulation (13) et l'élément de cadre (8, 9, 10, 11) est également libérable, un ou plusieurs élément(s) de cadre (8, 9, 10, 11) étant doté(s) de moyens de retenue destinés à ladite première partie d'articulation (13).
5. Construction de fenêtre (1) selon l'une quelconque des revendications précédentes, **caractérisée par** le fait de comprendre un dispositif de levage (19) agissant sur le cadre et étant raccordé à un élément de châssis (8, 9, 10, 11), fixé, de façon libérable, de préférence à un élément latéral de châssis (10, 11).
6. Construction de fenêtre (1) selon la revendication 5, **caractérisée en ce que** le dispositif de levage est un fil métallique de ressort recourbé essentiellement en forme de Y qui, au niveau de sa branche centrale, est fixé à un élément latéral de châssis, et **en ce que** les deux branches s'étendent le long de l'élément latéral de châssis et sont recourbées au niveau des extrémités afin que, dans une situation non chargée, elles soient orientées essentiellement perpendiculairement vers l'extérieur à partir du plan du châssis.
7. Construction de fenêtre (1) selon la revendication 5 ou 6, **caractérisée en ce que** les éléments latéraux de châssis (5, 6) sont dotés d'un ou de plusieurs moyen(s) de retenue (21, 22) destiné(s) au dispositif de levage (19).
8. Construction de fenêtre (1) selon l'une quelconque des revendications 5 à 7, **caractérisée en ce que** le cadre comporte des moyens pour un guidage au dispositif de levage par un transfert de couple de rotation.
9. Construction de fenêtre (1) selon l'une quelconque

des revendications précédentes, **caractérisée en ce que** la construction de fenêtre (1) comprend, de plus, un élément de liaison (16) agencé entre un élément de châssis (3, 4, 5, 6) et un élément de cadre (8, 9, 10, 11), l'élément de liaison (16) étant adapté pour un raccordement libérable avec le châssis et/ou le cadre. 5

10. Construction de fenêtre (1) selon la revendication 9, **caractérisée en ce que** l'élément de liaison (16) est une articulation, de préférence, une articulation à genouillère, laquelle est adaptée pour un verrouillage de l'articulation, dans la position en extension complète, correspondant à une ouverture maximale de la fenêtre. 10 15

11. Construction de fenêtre (1) selon l'une quelconque des revendications 9 - 10, **caractérisée en ce que** l'élément de liaison (16) constitue également le dispositif de levage (19). 20

12. Construction de fenêtre (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** la construction de fenêtre (1) comprend un dispositif de commande (18) connecté à un élément de cadre (8, 9, 10, 11) ou à une vitre (17) montée dans le cadre (7), lequel dispositif est conçu pour coopérer avec un moyen d'engagement (20) monté sur le châssis (2). 25 30

13. Construction de fenêtre (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le cadre (7) et le châssis (2) sont agencés de sorte que le cadre (7) puisse, facultativement, être raccordé au châssis (2) pour pivoter autour d'un axe le long d'un premier élément latéral de châssis (5) ou de l'autre élément latéral de châssis (6), le cadre (7) et le châssis (2) étant adaptés en vue d'une connexion ou d'une déconnexion mutuelle, avec de possibles éléments de raccordement (16, 18, 19). 35 40

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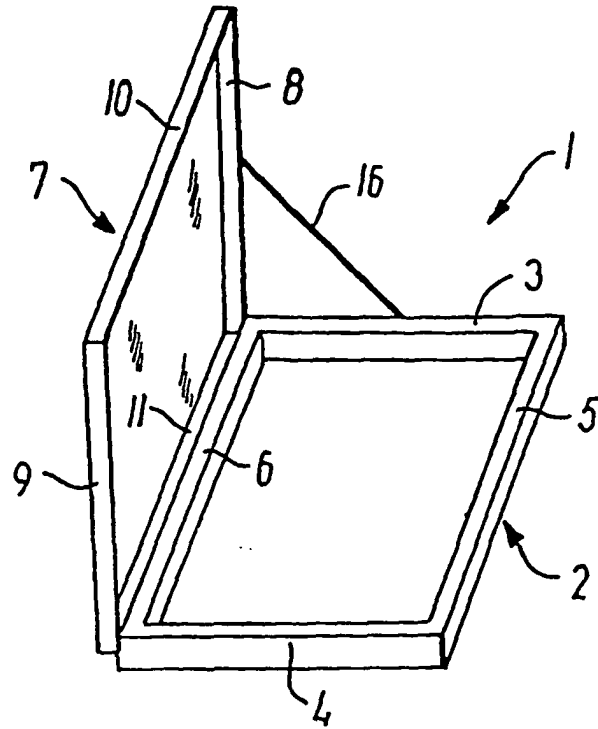


FIG. 1

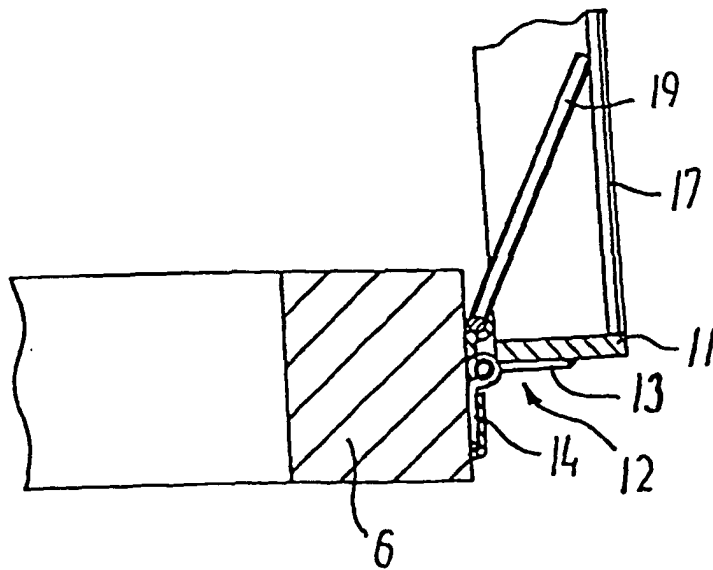


FIG. 2

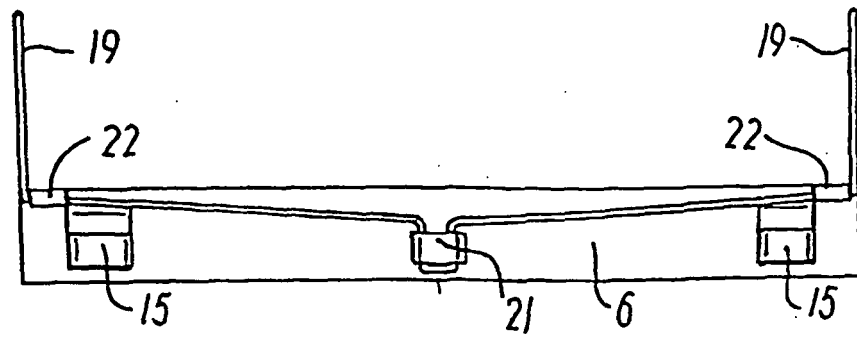


FIG. 3

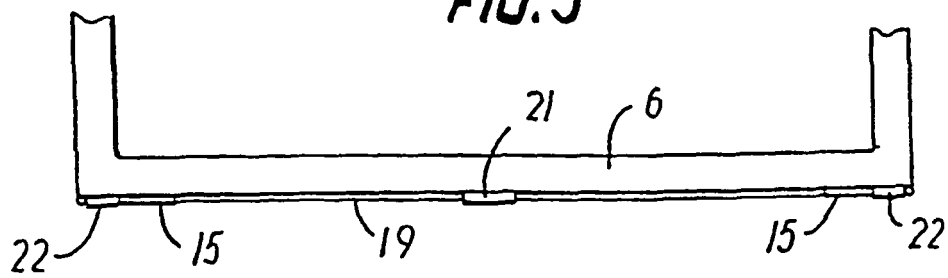


FIG. 4

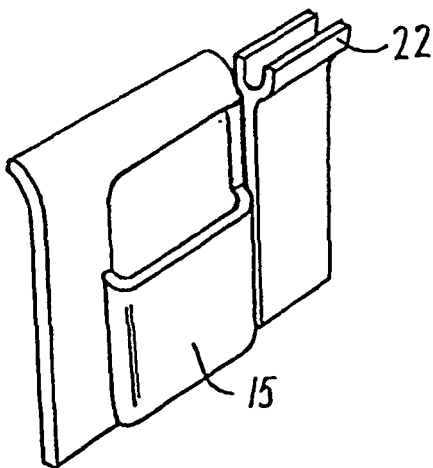


FIG. 5

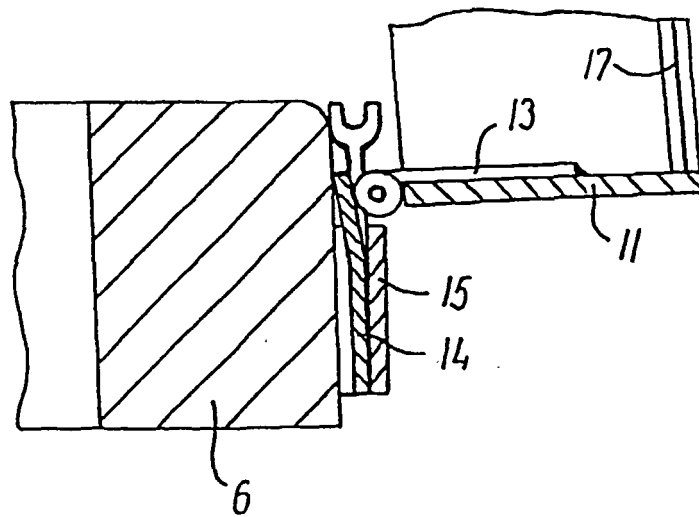


FIG. 6

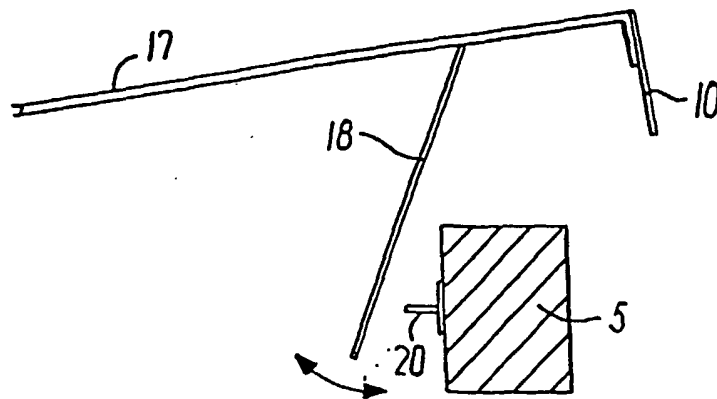


FIG. 7

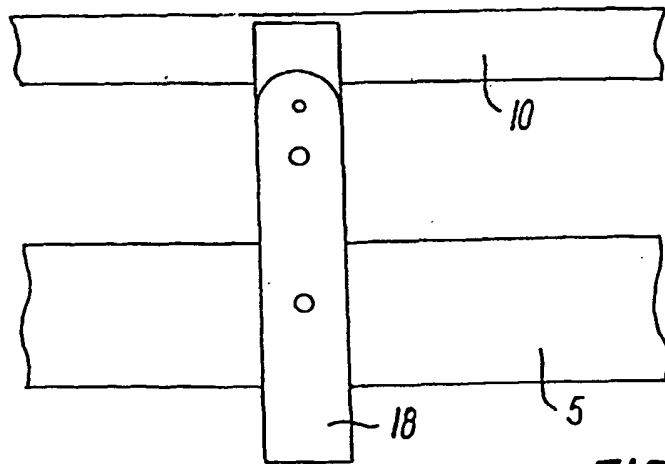


FIG. 8

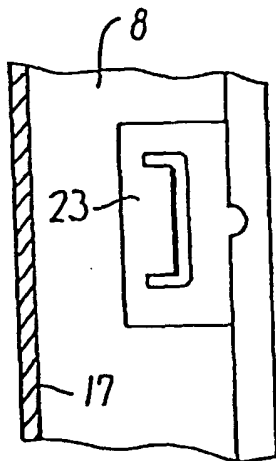


FIG. 9

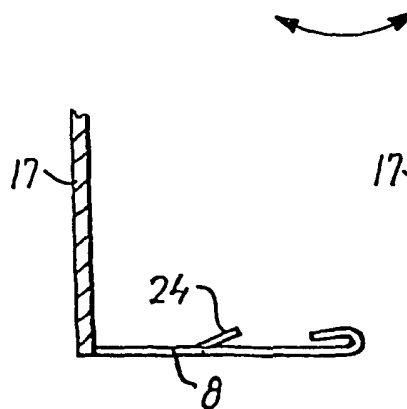


FIG. 10

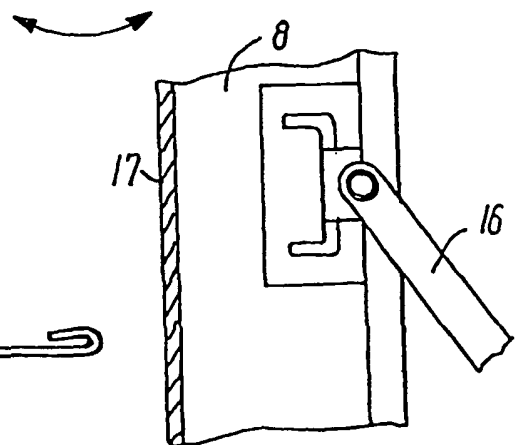


FIG. 11

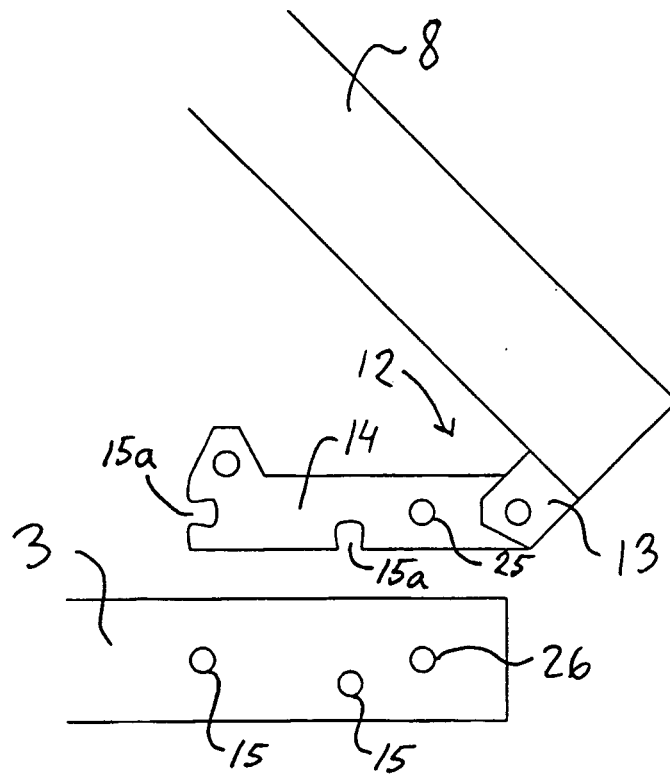


FIG. 12

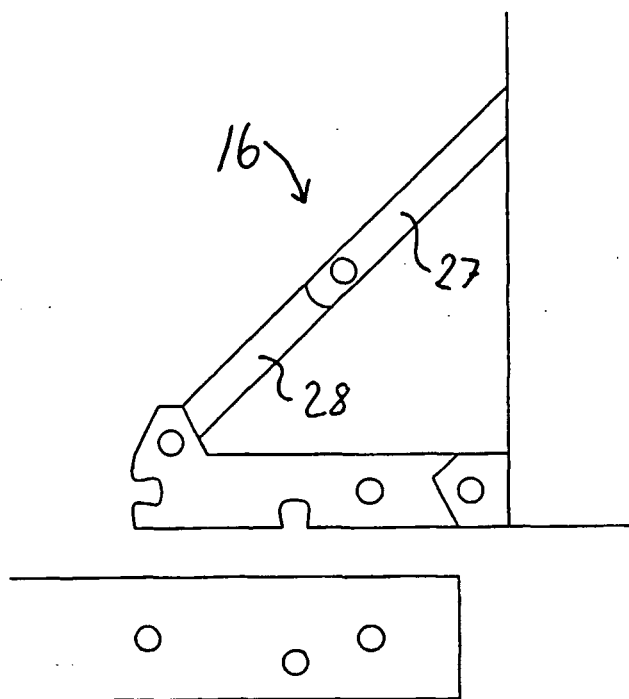


FIG. 13

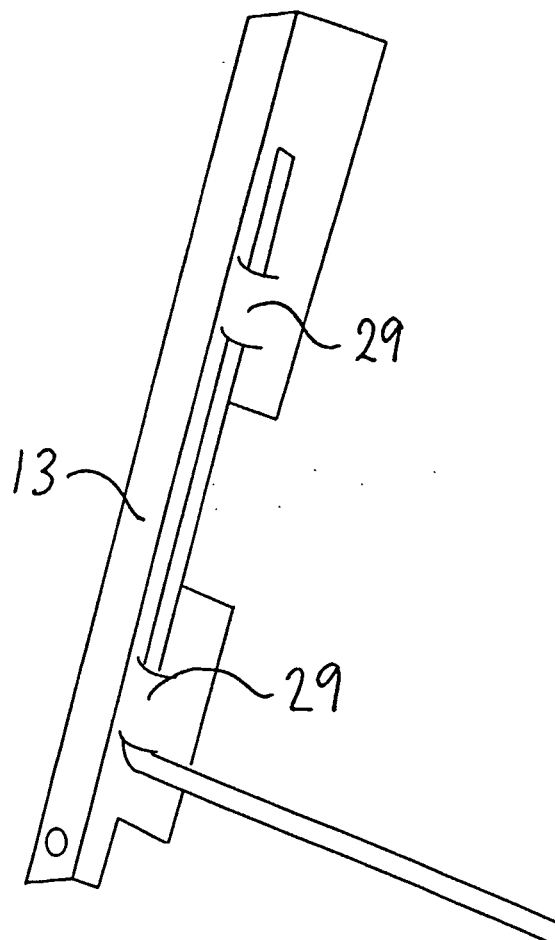


FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0519197 A [0003]
- DK 139822 B [0003]