



(11) **EP 1 106 764 B9**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see
Claims EN 1

(51) Int Cl.:
E05D 15/30 (2006.01)

(48) Corrigendum issued on:
16.09.2009 Bulletin 2009/38

(45) Date of publication and mention
of the grant of the patent:
03.06.2009 Bulletin 2009/23

(21) Application number: **00124222.1**

(22) Date of filing: **09.11.2000**

(54) **Window stay**

Fensterbeschlag

Entrebâilleur de fenêtre

(84) Designated Contracting States:
DE ES GB IT

(30) Priority: **10.12.1999 JP 35193699**

(43) Date of publication of application:
13.06.2001 Bulletin 2001/24

(73) Proprietor: **Nakanishi Engineering Co., Ltd.**
Chiyoda-ku,
Tokyo (JP)

(72) Inventors:
• **Nakanishi, Yoshikazu**
Chiyoda-ku,
Tokyo (JP)

• **Matsubara, Kenkichi,**
Nakanishi Industrial Co., Ltd
Chiyoda-ku,
Tokyo (JP)

(74) Representative: **Klingseisen, Franz et al**
Klingseisen & Partner
Bräuhausstrasse 2
80331 München (DE)

(56) References cited:
US-A- 5 255 471 **US-A- 5 898 977**

EP 1 106 764 B9

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

BACKGROUND OF THE INVENTION

(1) Technical field to which the Invention belongs

[0001] The present invention relates to a window stay according to the preamble of claim 1, used for a casement window wherein when a window is opened and closed, the window moves slidingly from and to a window frame.

(2) Prior art

[0002] US-A-5 898 977 describes a window stay according to the preamble of claim 1.

[0003] A window system has been known wherein a window is mounted in a window frame via a stay and when the window is opened, the window revolves around while revolving on its own axis and slides outwardly. In this window system, as shown in, for example, Fig.4, a window (3) is mounted on a window frame (1) via upper and lower stays (2a), (2b). The structures of the stays (2a), (2b) are same to each other except for some parts.

[0004] Fig. 5 shows an example of the stay (2b) disposed at the lower portion of the window, wherein this stay (2b) has a track member (4) mounted on the window frame (1) and a bar member (5) mounted on the window (3), and a slide (6) is slidably mounted in a groove formed on the track member (4). A first arm (8) is pivotally mounted on a pivot (7) at one end of the track member (4), and the top end of the first arm (8) is pivotally mounted at the intermediate portion of the bar member (5) by means of a pivot (9). A second arm (12) is pivotally mounted on a pivot (11) at a top end (10) side of the bar member (5), and this second arm (12) is pivotally mounted on the slide (6) by means of a pivot (13). Between the slide (6) and the intermediate portion of the first arm (8), a third arm (14) is pivotally mounted by means of pivots (15), (16). Further, between the intermediate portion of the third arm (14) and the intermediate portion of the bar member (5), a fourth arm (17) is pivotally mounted by means of pivots (18), (19).

[0005] In the above structure, when the window (3) mounted on the bar member (5) is moved from the window frame (1) toward the open position, the bar member (5) is rotated by the actions of the arms (8),(12), (14), (17) to the position at which the slide (6) abuts a stopper (20) disposed on the track member (4), and opens the window (3).

[0006] When the window (3) is rotated from the open position toward the window frame (1) side, the slide (6) is moved by the actions of the arms (8), (12), (14), (17) in a direction such that it moves away from the stopper (20) of the track member (4), and the window (3) can be closed.

[0007] When the window (3) is closed, the track member (4) and the bar member (5) are overlaid to each other in such a state that the arms are collapsed. A mechanism

for securely drawing near the window (3) at this time is provided. As the drawing mechanism, in the conventional stay as shown in the figure, at the top end (10) of the bar member (5), a projection portion (21) which projects eccentrically toward the track member (4) side and a sloping face (22) are provided. On the other hand, an end cap (25) is mounted at the end portion of the track member (4). The end cap (25) provides a sloping face (23) which corresponds to the projection portion (21) and the sloping face (22), and a recess (24) which inclines toward one side. When the window (3) is closed, the top end (10) of the bar member (5) moves in a direction of an arrow (A), and the projection portion (21) and the sloping face (22) are guided by the sloping face (23) of the end cap (25) formed in the track member (4), and the projection portion (21) enters the recess (24). At this time, the window (3) can be drawn toward the window frame (1) by the shape of the sloping face.

[0008] In the window stay having the structure as shown in Fig. 5, when the top end (10) of the bar member (5) is engaged with the end cap (25) of the track member (4), if it is attempted to enter the top end (10) from the recess (24) side, the projection portion (21) abuts the side wall which constitutes the recess (24) and the bar member (5) can not be moved further. Namely, it is possible to engage the top end (10) of the bar member (5) only from the sloping face (23) side which is slantingly formed toward one side of the end cap (25). Accordingly, as shown in Fig. 4, the stay (2a) and the stay (2b) used for the upper and lower sides of the window (3) respectively, are different in the shapes of the top end (10) of the bar member (5) and the end cap (25) of the track member (4). These shapes are symmetrical. Therefore, it is required to prepare separate window stays for the upper and lower portions. Further, when the right and left sides of the window are to be mounted to the window frame with stays, it is also necessary to use right and left stays of different structures for the same reason.

[0009] Moreover, a stay has been known wherein the top end of the bar member is formed into a V-shape in which the projection portion is on the center line, and the end cap of the track member is formed into a V-shape in which the center part is most deeply recessed so that the top end may fit to the end cap.

[0010] However, with the stay having the V-shape top end and the V-shape recess simply combined, since the top end is not supported surely, its deflection is large and the window can not be tightly closed. In addition, when the window is opened or closed, since the top of the bar member moves freely, the top end abuts the end cap and jams with it as it is, whereby it may sometimes happen that the window is locked as the window remains slightly open.

[0011] A stay has been proposed wherein the pivoting axis of the link constituting the stay is offset to one side from the center line so that the link rotates in one direction, whereby the opening and closing of the window can be made smoothly. However, in such a stay, depending

upon the the offset state, the link can rotate in either one direction of clockwise and counterclockwise directions. Accordingly, in such a stay, it is required to change the upper and lower, or right and left structures depending upon the site where it is to be used.

SUMMARY OF THE INVENTION

[0012] It is an object of the present invention to provide a window stay wherein a window is mounted on a window frame via the stay and when the window is opened or closed, the window revolves around while revolving on its own axis, wherein the window stay has a drawing mechanism which can be used for any position of the upper and lower, or right and left positions of the window.

[0013] Further, it is another object of the present invention to provide a window stay useful at any one of the upper and lower, or right and left positions, wherein when the window is opened and closed, the window can be opened and closed smoothly without causing a locked state. These objects are solved by the window stay according to claim 1.

[0014] The present invention provides a window stay which comprises a track member mounted on a window frame, a bar member mounted on a window, a slide slidably mounted on the track member, a first arm connecting the track member to the bar member and a second arm connecting the bar member and the slide which are used for moving the bar member to a closed position where the bar member overlays the track member or an open position where the bar member is slidably moved from the track member, an engaging projection disposed at the center of the top end of the bar member, an insert groove formed at the center of the end portion of the track member to which the engaging projection can be inserted when the bar member is moved to the closed position where it overlays the track member and a guide wall formed at the front portion of the insert groove for guiding the engaging projection to the insert groove. The above objects can thereby be accomplished.

[0015] The present invention further provides a window stay wherein a receiving member having a guide wall which widens in a transverse direction is formed at the front portion of the insert groove, and the receiving member is mounted at the end portion of the track member, by which the above objects can be accomplished.

BRIEF EXPLANATION OF THE DRAWINGS

[0016] The foregoing summary, as well as the following detailed description of the preferred embodiments of the invention, will be better understood when read in conjunction with the accompanying drawings. For the purpose of illustrating the invention, there is shown in the drawings an embodiment which is presently preferred. It should be understood, however, that the invention is not limited to the precise arrangement and instrumentalities shown. In the drawings:

Fig. 1 is a plane view showing an example of the present invention, in a state where the window is opened and the bar member is slidably moved to the open position.

Fig. 2 is a sectional view showing a state where the window is closed and the bar member overlays the track member.

Fig. 3(A) and 3(B) are explanatory views showing the relationship between the engaging projection and the insert groove. Fig. 3(A) is an explanatory view in the case of example shown in Fig. 1. Fig. 3(B) is an explanatory view showing another example. Fig. 4 is a front view showing the relationship between the window and the window frame.

Fig. 5 is a plane view showing a prior art of a conventional window stay.

PREFERRED EMBODIMENTS OF THE INVENTION

[0017] Fig. 1 and Fig. 2 show an example of the present invention. In these figures, a track member (30) to be mounted on a window frame by passing bolts (not shown) ... through mounting apertures (a), is formed into a substantially C-shape in cross section, and has a sliding groove (31) which extends in a longitudinal direction, wherein a slide (32) is mounted on the sliding groove (31). This slide (32) can slide in an axial direction to the position where the slide abuts a stopper (33) formed within the sliding groove (31).

[0018] At one end of the track member (30), a first arm (35) is pivotally mounted by means of a pivot (34), and another end of the first arm (35) is pivotally mounted on the intermediate portion of a bar member (37) by means of a pivot (36). At the top end (38) side of the bar member (37), a second arm (39) is pivotally mounted by means of a pivot (40). Another end of the second arm (39) is pivotally mounted on the slide (32) by means of a pivot (41). To the bar member (37), a window is mounted by passing bolts (not shown) through mounting apertures (a)...

[0019] Between the first arm (35) and the slide (32), a third arm (44) is pivotally mounted by means of pivots (42), (43). Further, a control arm (46) is pivotally mounted on a pivot (45) disposed at the intermediate portion of the second arm (39), and an engaging groove (47) which slidably engages with the pivot (43) is formed at the top end of the control arm (46). The control arm may be pivotally mounted on the pivot (43) and the engaging groove may be formed at the pivot (45) side side (not shown).

[0020] By the above respective arms, the bar member (37) can be moved to the closed position (Fig. 2) where it overlays the track member (30) and the window is closed, and to the open position (Fig. 1) where it slidably moves away from the track member (30) and the window is open. At the positions as shown in Fig. 1, since the pivot (43) abuts the deepest position of the engaging groove (47), the second arm (39) is no more rotated counterclockwise in this figure and the movement of the bar

member (37) is restricted.

[0021] At the center of the top end of the bar member (37), is disposed an engaging projection (48) having side faces (48a), (48a) which extend in a longitudinal direction of the bar member. Further, an insert groove (49) extending in the longitudinal direction of the track member is disposed at the center of the end portion of the track member (30) so that when the bar member (37) moves to the position where it overlays the track member (30), the engaging projection (48) can enter. The insert groove (49) is formed in a receiving member (50) fixed on the track member (30). However, the receiving member (50) and the track member (30) may be formed integrally.

[0022] As shown in Fig. 3, in order to securely fit the engaging projection (48) into the insert groove (49), at the front portion of the insert groove (49), a guide wall (51) widening in the transverse direction of the track member (30) is formed. The guide wall (51) has sloping faces (52), (52) of symmetrical shapes such that the insert groove side becomes narrow in relation to the transverse direction of the track member (30), and the sloping faces continue to side faces (49a), (49a) of the insert groove (49) via corner sections (49b), (49b). The corner sections (49b), (49b) may be curved in an arcuate shape (not shown). The insert groove (49) is open at both ends (Fig. 3(A)). However, as shown in Fig. 3 (B), a wall (53) may be provided at the outward end portion to shut this end.

[0023] Since the guide wall (51) is open in the transverse direction of the track member (30), the engaging projection (48) can be guided by the sloping faces (52), (52) and enter the insert groove (49) even if the engaging projection (48) abuts any one of the sloping faces (52), (52) of the guide wall (51). Then, the engaging projection (48) is securely kept in the insert groove in such a state that the side faces (48a), (48a) of the engaging projection (48) face the side faces (49a), (49a) of the insert groove (49).

[0024] The shape of the periphery of the top end of the engaging projection (48) and the shape of the sloping face of the guide wall (51), may be preferably in an appropriate curved shape so that when the engaging projection (48) contacts the guide wall (51), the contact surface makes a line contact, preferably an area contact.

[0025] Further, the width of the insert groove (49) is formed a little larger than the width of the engaging projection (48) so that when the engaging projection (48) enters the insert groove (49) or slips out of the insert groove (49), the movement of the engaging projection (48) can be made smoothly. However, if the gap is too larger, the window is rickety, and therefore the gap is preferably as small as possible so far as the movement of the engaging projection (48) is not obstructed. The length of the engaging projection is appropriately adjusted so that it will not interfere the above operation.

[0026] As indicated by a dash-double-dot line in Fig. 3 (A), the engaging projection (48) can be inserted from either side of the insert groove (49), and slip out from

either side. Accordingly, the bar member (37) connected to the track member (30) by means of the first arm (35) or the like, can be moved to the upper side of the track member (30) as shown in in Fig. 1 by rotating the first arm (35) counterclockwise, or to the lower side by rotating the first arm (35) clockwise (not shown). Then, the bar member (37) can be moved from either side to the position where it overlays the track member (30).

[0027] When the engaging projection (48) enters the insert groove (49), the engaging projection (48) abuts the guide wall (51), and by the guide wall (51), the movement of the bar member (37) having the engaging projection (48) thereon can be controlled. Then, since the bar member (37) moves while the engaging projection (48) is kept in the insert groove (49), the bar member (37) can be drawn toward the track member (30) and the window can be tightly closed.

[0028] When the window is opened, since the bar member (37) starts to rotate around the engaging projection (48) which is fitted to the insert groove (49) of the track member (30), the movement of the bar member (37) is smooth. In addition, the engaging projection (48) is guided by the insert groove (49) and moves in the longitudinal direction of the track member (30), by which the slide (32) can be moved in the longitudinal direction via the second arm (39) and smooth operation can be made without creating a locked state.

[0029] The window stay of the present invention is constructed as mentioned above, and comprises a track member mounted on a window frame, a bar member mounted on a window, a slide slidably mounted on the track member, a first arm connecting the track member to the bar member and a second arm connecting the bar member and the slide which are used for moving the bar member to a closed position where the bar member overlays the the track member or an open position where the bar member is slidingly moved away from the track member, an engaging projection disposed at the center of the top end of the bar member, an insert groove formed at the center of the end portion of the track member to which the engaging projection can be inserted when the bar member is moved to the closed position where it overlays the track member, and a receiving member having a guide wall formed at the front portion of the insert groove for guiding the engaging projection to the insert groove. The engaging projection formed at the center of the top end of the bar member, can be inserted into the insert groove provided at the center of the end portion of the track member and move away from the insert groove, from either side of the track member, whereby it is possible to employ stays of same structure at the upper and lower, or right and left sides of the window.

[0030] Further, by the guide wall, the movement of the engaging projection entering the insert groove can be restricted and the opening and closing of the window can be controlled, whereby it is possible to draw the window to the window frame via the bar member and to obtain a window having air tightness and being free from ricketi-

ness in a closed state. Moreover, when the window is opened, since the bar member starts to rotate around the engaging projection fitted to the insert groove, no locked state is created during the opening and closing movements and the window can be opened and closed smoothly.

[0031] When the control arm is provided between the second arm and the slide, at the position where the window is open, it is possible to prevent the bar member from further rotating around the axis around which the first arm is pivotally mounted, and safety can be secured.

[0032] From the foregoing description, it can be seen that the present invention provides an improved window stay. It will be appreciated by those skilled in the art that obvious changes can be made to the embodiments described in the foregoing description without departing from the broad inventive concept thereof. It is understood, however, that this invention is not limited to the particular embodiments disclosed, but is intended to cover all obvious modifications thereof which are within the scope and the spirit of the invention as defined by the appended claims.

Claims

1. A window stay which comprises a track member (30) mounted on a window frame, a bar member (37) mounted on a window, a slide (32) slidably mounted on the track member (30), a first arm (35) connecting the track member (30) to the bar member (37), a second arm (39) connecting the bar member (37) to the slide (32) and a third arm (44) connecting the first arm (35) to the slide (32), for moving the bar member (37) to a closed position where the bar member (37) overlays the track member (30) or to an open position where the bar member (37) is slidingly moved away from the track member (30), an engaging projection (48) disposed at the center of the top end of the bar member (37), an insert groove (49) formed at the center of the end portion of the track member (30) to which the engaging projection (48) can be inserted when the bar member (37) is moved to the closed position where it overlays the track member (30), and a guide wall (51) formed at the front portion of the insert groove (49) for guiding the engaging projection (48) to the insert groove (49), **characterised in that** between the second arm (39) and the slide (32), a control arm (46) which restricts an opening angle of the second arm (39) is disposed, wherein the control arm (46) is pivotally mounted on a pivot (45) disposed at an intermediate position of the second arm (39), and comprises an engaging groove (47) at an end thereof, which slidingly engages with a further pivot (43) connecting the third arm (44) to the slide (32), and wherein the opening angle of the second arm (39) is restrict-

ed, when said further pivot (43) abuts the deepest position of the engaging groove (47),

2. The window stay according to Claim 1, wherein the guide wall (51) widens in a transverse direction, the insert groove (49) and the guide wall (51) are formed in a receiving member (50), and the receiving member (50) is mounted at the portion of the track member (30).
3. The window stay according to Claim 1, wherein the engaging projection (48) has a side face (48a) extending in a longitudinal direction of the bar member (37).
4. The window stay according to Claim 1, wherein the insert groove (49) has a side face (49a) extending in a longitudinal direction of the track member (30).

Patentansprüche

1. Fensterbeschlag, welcher umfasst ein Schienenelement (30), das auf einem Fensterrahmen angebracht ist, ein Stangenelement (37), welches auf einem Fenster angebracht ist, ein Gleitstück (32), welches gleitfähig auf dem Schienenelement (30) angebracht ist, einen ersten Arm (35), welcher das Schienenelement (30) mit dem Stangenelement (37) verbindet, einen zweiten Arm (39), welcher das Stangenelement (37) mit dem Gleitstück (32) verbindet, und einen dritten Arm (44), welcher den ersten Arm (35) mit dem Gleitstück (32) verbindet, um das Stangenelement (37) in eine geschlossene Position zu bewegen, in welcher das Stangenelement (37) das Schienenelement (30) überlagert, oder in eine geöffnete Position bewegt, in welcher das Stangenelement (37) gleitend von dem Schienenelement (30) wegbewegt ist, einen Eingriffsvorsprung (48), welcher an dem Zentrum des oberen Endes des Stangenelements (37) angeordnet ist, eine Einsetznut (49), welche an dem Zentrum des Endabschnitts des Schienenelements (30) ausgebildet ist, in welche der Eingriffsabschnitt (48) eingesetzt werden kann, wenn das Stangenelement (37) in die geschlossene Position bewegt ist, in welcher es das Schienenelement (30) überlagert, und eine Führungswand (51), die an dem vorderen Abschnitt der Einsetznut (49) zum Führen des Eingriffsabschnitts (48) zu der Einsetznut (49) ausgebildet ist, **dadurch gekennzeichnet, dass** zwischen dem zweiten Arm (39) und dem Gleitstück (32) ein Kontrollarm (46), welcher einen Öffnungswinkel des zweiten Arms (39) begrenzt, angeordnet ist, wobei der Kontrollarm (46) gelenkig auf einer Achse (45) angebracht ist, die an einer zwischenliegenden Position des zweiten Arms (39) angeordnet ist, und umfasst

eine Eingriffsnut (47) an einem Ende davon, welche gleitend in eine weitere Achse (43) eingreift, welche den dritten Arm (44) mit dem Gleitstück (32) verbindet, und wobei der Öffnungswinkel des zweiten Arms (39) begrenzt ist, wenn die weitere Achse (43) an der tiefsten Position der Eingriffsnut (47) anliegt.

2. Fensterbeschlag nach Anspruch 1, wobei die Führungswand (51) sich in einer Querrichtung ausweitet, die Einsetznut (49) und die Führungswand (51) in einem Aufnahmeelement (50) ausgebildet sind, und das Aufnahmeelement (50) an dem Abschnitt des Schienenelements (30) angebracht ist.
3. Fensterbeschlag nach Anspruch 1, wobei der Eingriffsvorsprung (48) eine Seitenfläche (48a) aufweist, welche sich in einer Längsrichtung des Stangelements (37) erstreckt.
4. Fensterbeschlag nach Anspruch 1, wobei die Einsetznut (49) eine Seitenfläche (49a) aufweist, welche sich in einer Längsrichtung des Schienenelements (30) erstreckt.

contrôle (46) comprenant une rainure d'enclenchement (47) sur l'un bout, qui s'enclenche mobilement avec un autre pivot (43) qui joint le troisième manche (44) au chariot (32), l'angle d'ouverture du deuxième manche (39) étant limité quand l'autre pivot (43) est en contact avec la position plus profonde de la rainure d'enclenchement (47).

2. L'étai de fenêtre selon la revendication 1, le panneau de guidage (51) s'élargissant selon une direction transversale, la rainure d'insertion (49) et le panneau de guidage (51) étant formés dans un élément de réception (50) et l'élément de réception (50) étant monté à la partie de l'élément de rail (30).
3. L'étai de fenêtre selon la revendication 1, la saillie d'enclenchement (48) ayant une face latérale (48a) qui s'étend selon une direction longitudinale de l'élément de barreau (37).
4. L'étai de fenêtre selon la revendication 1, la rainure d'insertion (49) ayant une face latérale (49a) qui s'étend selon une direction longitudinale de l'élément de rail (30).

Revendications

1. Un étai de fenêtre comprenant un élément de rail (30) monté sur un châssis de fenêtre, un élément de barreau (37) monté sur une fenêtre, un chariot (32) monté mobilement sur l'élément de rail (30), un premier manche (35) qui joint l'élément de rail (30) à l'élément de barreau (37), un deuxième manche (39) qui joint l'élément de barreau (37) au chariot (32), et un troisième manche (44) qui joint le premier manche (35) au chariot (32), pour déplacer l'élément de barreau (37) à une position fermée où l'élément de barreau (37) superpose l'élément de rail (30) ou à une position ouverte où l'élément de barreau (37) s'éloigne glissement du l'élément de rail (30), une saillie d'enclenchement (48) prévue au centre du plus haut bout de l'élément de barreau (37), une rainure d'insertion (49) formée au centre de la partie de bout de l'élément de rail (30), dans laquelle la saillie d'enclenchement (48) peut être insérée quand l'élément de barreau (37) est déplacé à la position fermée où il superpose l'élément de rail (30), et un panneau de guidage (51) formé à la partie avant de la rainure d'insertion (49) pour guider la saillie d'enclenchement (48) jusqu'à la rainure d'insertion (49), **caractérisé en ce qu'**un manche de contrôle (46) est prévu entre le deuxième manche (39) et le chariot (32) et limite un angle d'ouverture du deuxième manche (39), le manche de contrôle (46) étant monté rotativement sur un pivot (45) qui est prévu à une position intermédiaire du deuxième manche (39), le manche de

FIG. 1

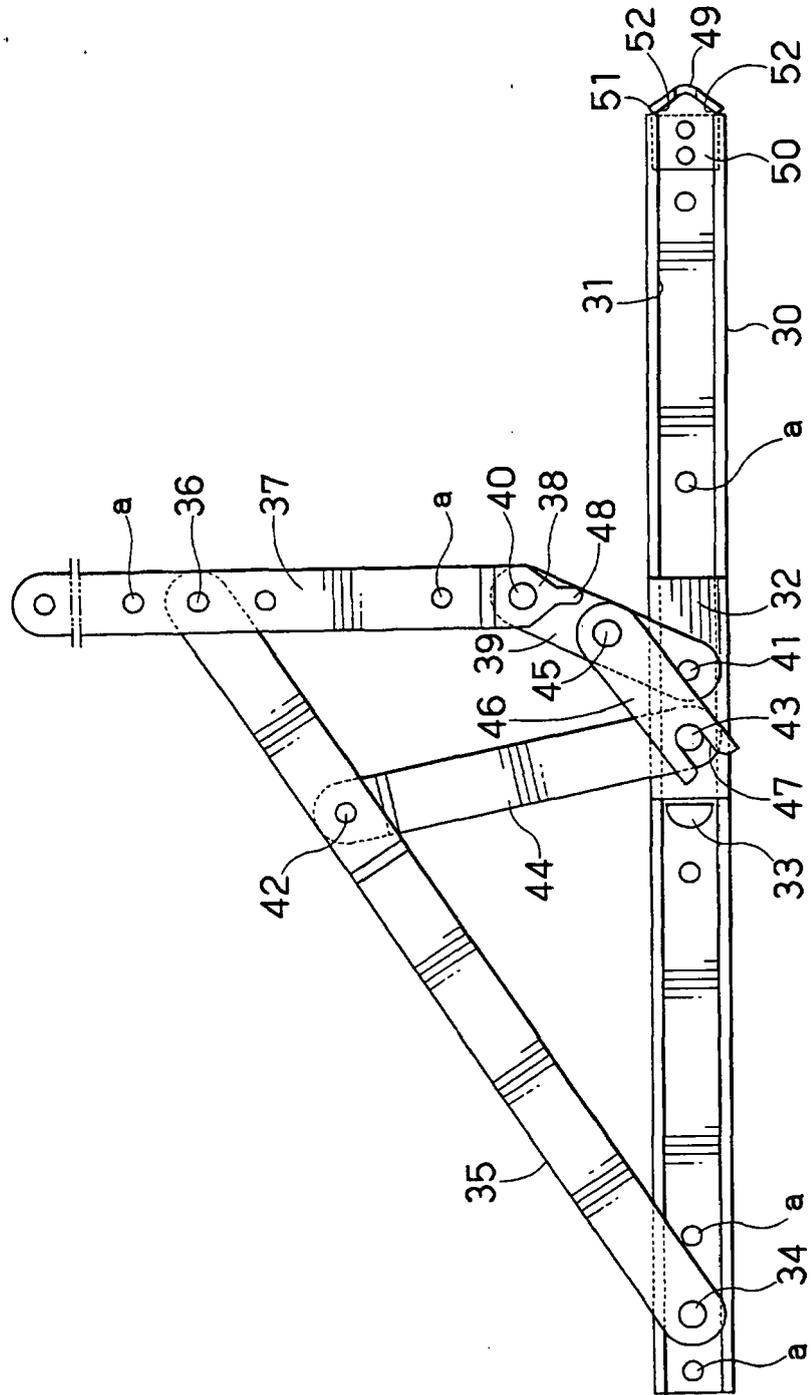


FIG. 2

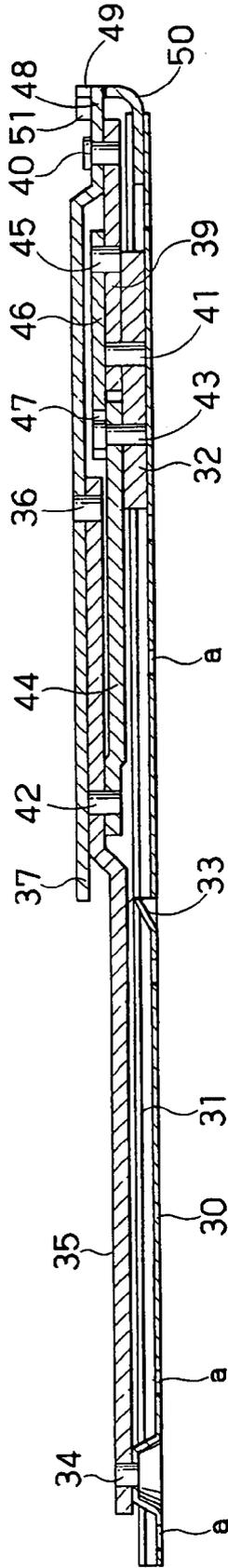


FIG. 3 (A)

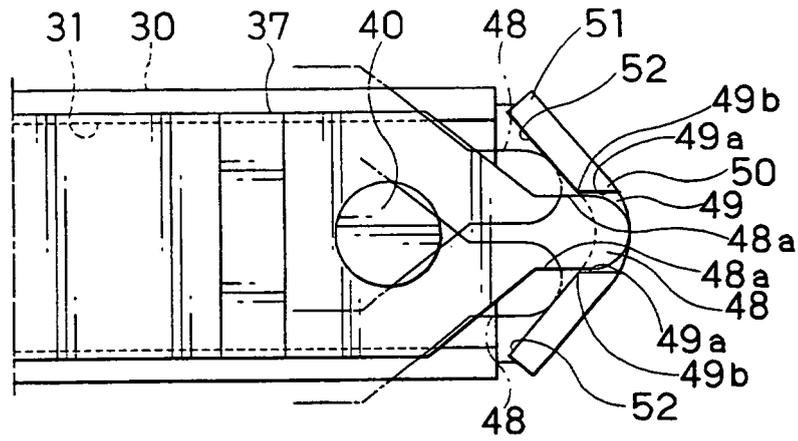


FIG. 3 (B)

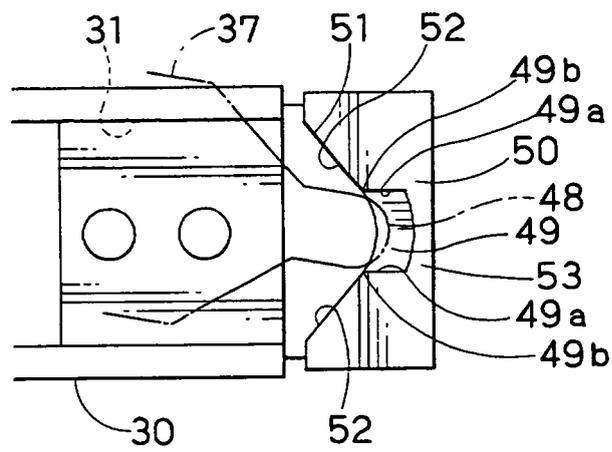


FIG. 4

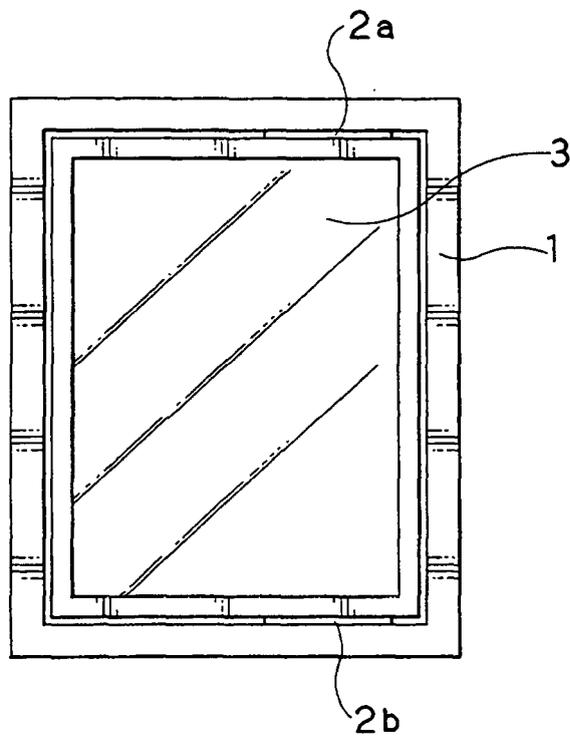
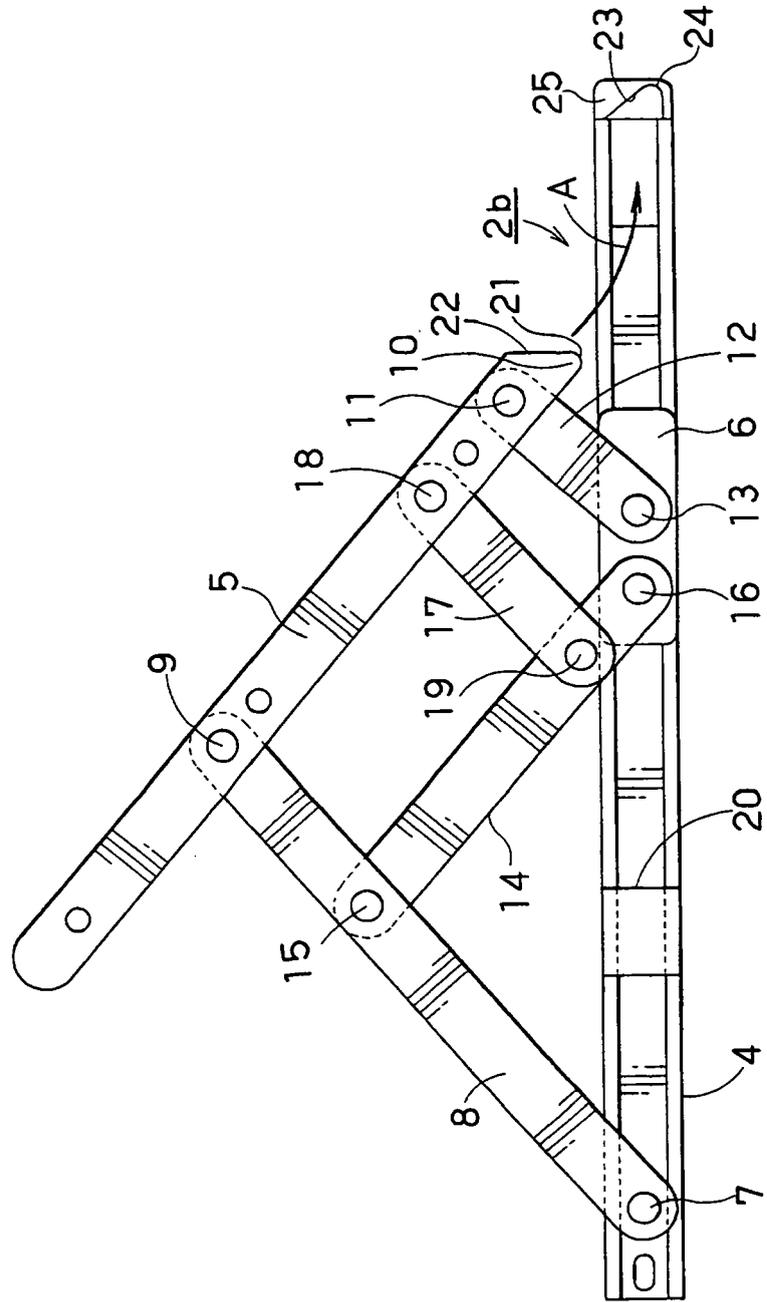


FIG. 5



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5898977 A [0002]