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Description

[0001] The present invention relates to a hinge assembly for connecting a displaceable and turnable sash member with respect to a main frame member of a reversible window or door, said hinge assembly comprising a guide member adapted to be secured to the sash member at a sash corner for displaceable connection with said main frame member, a first arm adapted for pivotal connection at one end with a main frame corner at said main frame, which in a closed position of the window or door is opposite said sash corner, and at the other end with said sash member in a first pivot point displaced from said sash corner, and a second arm adapted for displaceable and pivotal connection at one end with said main frame member and for pivotal connection at the other end with said sash member in a second pivot point displaced from said sash corner, and further comprising friction means for controlling the motion of the sash member with respect to the main frame member.

[0002] From US-A-1,106 791 a swinging sash connection is known comprising a hinge assembly of this type, by means of which a window sash by sliding and pivoting motion with respect to the main frame can be turned around a horizontal axis between a closed position and an open position, in which the sash extends in a plane substantially at right angles to the main frame.

[0003] In this prior art structure frictional control of the sash motion is effected by friction means provided in connection with slide shoes, by which the guide member at the sash corner and one end of the second arm engage a vertical guide plate or rail alongside the vertical main frame member. This arrangement of friction means has the disadvantage that it is almost impossible to provide a frictional force, by which the sash can be held safely in any position without imposing a significant resistance to the sash movement during certain phases of the movement, in particular in the beginning of the opening movement from the closed position, where there is only a slight displacement of the guide member and said one end of the second arm with respect to the main frame member.

[0004] Moreover, whereas the first and second arm in this prior art structure form a unitary hinge device, the guide member at each upper sash corner is a separate member secured to the sash structure.

[0005] In WO 96/17151 a window is disclosed, in which the sash by means of separate first and second arms disposed as described above can be turned about a horizontal axis without frictional control from its normal closed position to a substantially inverted closed position, in which the sash is turned upside down, to allow cleaning of the external side of the pane from the inside.

[0006] Compared to these prior art structures, which are usable only with reversing windows turning about a horizontal axis, it is the object of the invention to provide a hinge assembly as defined, which is useful also in connection with windows and doors turning about a vertical axis, and in which all parts to be connected with the sash form a unitary hinge structure with integrated friction means.

[0007] According to the invention this object is achieved by a hinge assembly of the kind set forth, which is characterized in that said guide pin and first and second arms are interconnected in a unitary hinge structure by means of a third arm adapted to be secured to the sash member over a part of its length from said sash corner comprising said first and second pivot points, said friction means being integrated in the pivotal connection of said second arm with said third arm at said second pivot point, wherein said friction means is adjustable, and said friction means comprises a bolt-nut connection between said second arm and a bent-off flange part of said third arm, said bolt-nut connection incorporating at least one friction disc member, said flange part forms an abutment for said second arm in a position generally parallel to said third arm during a part of the motion of the sash member with respect to the main frame member towards a reversed or nearly reversed position of the window or door.

[0008] By the described interconnection of the guide member and the first and second arms in a unitary hinge structure the manufacture is simplified and the mounting of hinge assemblies according to the invention at each of two opposite sash members is facilitated. The integration of frictional control means in the hinge structure itself provides a safe and reliable control of the sash movement in all positions of the sash with respect to the main frame without any requirement of excessive force to manipulate the sash.

[0009] The hinge assembly of the invention is useful equally for windows turning about a horizontal axis in the same way as the prior art structures described above and for windows or doors turning about a vertical axis.

[0010] The invention will now be described in further detail with reference to the accompanying schematical drawing, in which

[0011] Figs. 1 to 3 are partially sectional views of an embodiment of a reversible side-hung window according to the invention seen in different positions of the sash with respect to the main frame, and

[0012] Figs. 4 and 5 show a preferred embodiment of the hinge assembly according to the invention in assembled and exploded views, respectively.

[0013] Figs. 1 to 3 show generally a sectional view of a reversible window in its closed position with two intersected frame side members 21 and 22 of a main frame 20 and a sash side member 30 disposed at right angles to the frame side members 21 and 22 and movable relative thereto. The sash is supported and carried by the main frame by hinge assemblies 40 to be further described below, which are connected between each of the opposite top and bottom members of the sash, such as member 30 and the corresponding top and bottom members of the main frame, such as member 31 shown in figs 2 and 3.

[0014] In the closed position of the window depicted in
In fig. 2 the sash member 30 is shown turned to an open position, in which the plane of the sash forms an opening angle of 90° with respect to the main frame 20. The hinge assembly 40 comprises a guide member 1 provided at an end portion 12 of an arm 11, which is secured to the sash side member 30 in engagement with the side edge thereof. The guide member 1 is disposed at a sash corner 13, at which the side member 30 joins a sash side member, not illustrated, and comprises a pin pivotally connected with a shoe 18, which displaceably engages a guide track 2 extending alongside the frame member 31, whereby the sash as a whole is turnable with respect to the main frame and may be displaced in the longitudinal direction of the frame member 31 through the engagement of the slide shoe 18 with the guide track 2.

The hinge assembly further comprises a first arm 3, one end 6 of which is pivotally connected with the main frame at a pivot point 14 located at the corner 23 between main frame members 30 and 31, which in the closed window position in fig. 1 is opposite the sash corner 13, whereas the opposite end 4 of arm 3 is pivotally connected with the arm 11 secured to the sash member 30 in a pivot point 5 displaced with respect to the sash corner 13 by a distance allowing displacement and turning of the sash with respect to the main frame.

A second arm 7 of the hinge assembly 40 is connected at one end 15 by a pivot 9 with a slide shoe 16, which in the embodiment shown engages the same guide track 2 at the main frame member 30 as the slide shoe 18 of the guide member 1. At the opposite end 17 the second arm 7 is pivotally connected with the arm 11 secured to the sash member 30 in a pivot point 10, which is displaced from the sash corner 13 by a distance slightly shorter than the displacement of pivot point 5 of the first arm 3 with respect to the sash corner 13.

In the embodiment shown the pivot point 10 of the second arm 7 is disposed in a bent-off flange part 24 of the arm 11 secured to the sash member 30, which as shown in fig. 3 forms an abutment 25 for the second arm 7. A frictional control of the sash movement is implemented in a simple manner by means of a bolt-nut connection comprising a bolt 50 and a nut 54. Friction disc members 52 and 53 are interposed between the arm 7 and the flange part 24 to provide adjustable friction to the sash movement.
bodiment of a window turning about a vertical axis, but
is equally useful for reversing windows, in which the sash
turns about a horizontal axis. Other variations from the
described and illustrated features may be envisaged.
Thus the slide shoe 16 of the second arm 7 is not bound
to engage the same guide track on the frame member as
the guide member 1, but may cooperate with a separate
track.

[0028] Releasable arresting means permitting safely
parking of the window in one or more open positions, i.e.
a slightly open ventilation position, may be incorporated
e.g. in the guide track on the frame.

Claims

1. A hinge assembly for connecting a displaceable and
turnable sash member (30) with respect to a main
frame member (31) of a reversible window or door,
said hinge assembly (40) comprising a guide mem-
ber (1) adapted to be secured to the sash member
(30) at a sash corner (13) for displaceable connec-
tion with said main frame member (31), a first arm
(3) adapted for pivotal connection at one end (14)
with a main frame corner (23) at said main frame,
which in a closed position of the window or door is
opposite said sash corner (13), and at the other end
(4) with said sash member in a first pivot point (5)
displaced from said sash corner (13), and a second
arm (7) adapted for displaceable and pivotal connect-
at one end (15) with said main frame member (31) and
for pivotal connection at the other end (17) with said sash member (30) in a second pivot point
(10) displaced from said sash corner (13), and further
comprising friction means (52, 53) for controlling the
motion of the sash member (30) with respect to the
main frame member (31) characterized in that said
guide pin (1) and first and second arms (3, 7) are
interconnected in a unitary hinge structure by means of a third arm (11) adapted to be secured to the sash member
(30) over a part of its length from said sash corner (13) comprising said first and second pivot points (5, 10), said friction means being integrated in the pivotal connection of said second arm (7) with said third arm (11) at said second pivot point (10), wherein said friction means is adjustable, and said friction means comprises a bolt-nut connection (51 - 54) between said second arm (7) and a bent-off flange part (24) of said third arm (11), said bolt-nut connection incorporating at least one friction disc member (52, 53), said flange part (24) forms an abut-
ment (25) for said second arm (7) in a position gene-
 rally parallel to said third arm (11) during a part of
the motion of the sash member (30) with respect to
the main frame member (31) towards a reversed or
nearly reversed position of the window or door.

Patentansprüche

1. Scharnierzusammenbau zur Verbindung eines ver-
stellbaren und drehbaren Flügelrahmenelements
(30) im Verhältnis zu einem Hauptrahmenelement
(31) eines Umkehrensters oder einer Umkehrtür,
der Scharnierzusammenbau (40), umfassend ein
Führungselement (1), welches dazu eingerichtet ist,
am Flügelrahmenelement (30) an einer Flügelrah-
mencke (13) zur verstellbaren Verbindung mit dem
Hauptrahmenelement (31) fixiert zu werden, einen
ersten Arm (3), der zur drehbaren Verbindung an
einem Ende (14) mit einer Hauptrahmencke (23)
am Hauptrahmen eingerichtet ist, der in einer ge-
schlossenen Position des Fensters oder der Tür der
Flügelrahmencke (13) entgegengesetzt ist, und am
anderen Ende (4) mit dem Flügelrahmenelement in
einem ersten Drehpunkt (5), von der Flügelrahmen-
cecke (13) verschoben, und einen zweiten Arm (7),
der zur verstellbaren und drehbaren Verbindung an
einem Ende (15) mit dem Hauptrahmenelement (31)
zur drehbaren Verbindung am anderen Ende
(17) mit dem Flügelrahmenelement (30) in einem
zweiten Drehpunkt (10), von der Flügelrahmencke
(13) verschoben, eingerichtet ist, und außerdem um-
fassend Friktionsmittel (52, 53) zur Steuerung der
Bewegung des Flügelrahmenelements (30) im Ver-
hältnis zum Hauptrahmenelement (31), dadurch
gekennzeichnet, dass der Führungsspin (1) und der
erste und zweite Arm (3, 7) mittels eines dritten Arms
(11), der dazu eingerichtet ist, am Flügelrahmenele-
ment (30) über einen Teil seiner Länge von der Flü-
gelrahmencke (13), umfassend den ersten und
die zwei Drehpunkt (5, 10), fixiert zu werden, in einer
einheitlichen Scharnierrestruktur miteinander verbun-
den sind, wobei das Friktionsmittel in die drehbare
Verbindung des zweiten Arms (7) mit dem dritten
Arm (11) am zweiten Drehpunkt (10) integriert ist,
wobei das Friktionsmittel justierbar ist, und das Fri-
tionsmittel eine Schraubenmutterverbindung (51 - 54)
zwischen dem zweiten Arm (7) und einem abge-
gebogenen Flanschteil (24) des dritten Arms (11)
umfasst, wobei die Schraubenmutterverbindung zu-
mindest ein Friktionsscheibenelement (52, 53) ent-
hält, wobei der Flanschteil (24) eine Stütze (25) für
den zweiten Arm (7) in einer Position bildet, die ge-
nerell parallel zum dritten Arm (11) während eines
Teils der Bewegung des Flügelrahmenelements (30)
im Verhältnis zum Hauptrahmenelement (31) in
Richtung einer umgekehrten oder fast umgekehrten
Position des Fensters oder der Tür ist.

Revendications

1. Ensemble charnière pour relier un élément châssis
déplaçable et tournable (30) relativement à un élé-
ment cadre principal (31) d’une fenêtre ou d’une por-
te réversible, ledit ensemble charnière (40) comprenant un élément de guidage (1) adapté de façon à être fixé à l’élément châssis (30) à un coin du châssis (13) pour obtenir une liaison déplaçable avec ledit élément cadre principal (31), un premier bras (3) adapté pour une liaison pivotante à une extrémité (14) avec un coin du cadre principal (23) au niveau dudit cadre principal, qui, dans une position fermée de la fenêtre ou de la porte, est en face dudit coin du châssis (13), et à l’autre extrémité (4) avec ledit élément châssis dans un premier point de pivotement (5) déplacé dudit coin du châssis (13), et un deuxième bras (7) adapté pour une liaison déplaçable et pivotante à une extrémité (15) avec ledit élément cadre principal (31) et pour une liaison pivotante à l’autre extrémité (17) avec ledit élément châssis (30) dans un deuxième point de pivotement (10) déplacé dudit coin du châssis (13), et comprenant en outre des moyens de friction (52, 53) pour contrôler le mouvement de l’élément châssis (30) relativement à l’élément cadre principal (31), caractérisé en ce que ladite cheville de guidage (1) et le premier et le deuxième bras (3, 7) sont interconnectés dans une structure de charnière unitaire au moyen d’un troisième bras (11) adapté de façon à être fixé à l’élément châssis (30) sur une partie de sa longueur à partir dudit coin du châssis (13) comprenant lesdits premier et deuxième points de pivotement (5, 10), lesdits moyens de friction étant intégrés dans la liaison pivotante dudit deuxième bras (7) avec ledit troisième bras (11) audit deuxième point de pivotement (10), ledit moyen de friction étant réglable, et ledit moyen de friction comprenant une liaison boulon-écrou (51-54) entre ledit deuxième bras (7) et une partie bride coudée (24) dudit troisième bras (11), ladite liaison boulon-écrou incorporant au moins un élément disque de friction (52, 53), en ce que ladite partie bride (24) forme une butée (25) pour ledit deuxième bras (7) dans une position généralement parallèle audit troisième bras (11) pendant une partie du mouvement dudit élément châssis (30) relativement audit élément cadre principal (31) vers une position inversée ou presque inversée de la fenêtre ou de la porte.
REFERENCES CITED IN THE DESCRIPTION

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- US 1106791 A [0002]
- WO 9617151 A [0005]