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(56) Documents Cited:
US 5619822 A **US 5185955 A**

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INT CL⁷ **E06B**
Other: **ONLINE: EPODOC, PAJ, WPI**

(54) Abstract Title: **Sash window assembly with transverse displacement means**

(57) A sash window assembly comprises a frame 1 with a sash window 2 being vertically slidable therein. A guiding device between the frame and the sash window is configured to displace the sash window transversely to the direction of sliding over a relatively small distance, which is sufficient to bring the sash window at least in the closed condition into a sealing contact with the frame with a sealing structure 10 provided in between, and to bring the sash window, while opening it, out of sealing contact with the frame. The guiding device may comprise a first guide 4 connected to one of the frame and the sash window for sliding the sash in an essentially vertical manner and a second guide 9 connected to the other of the frame and the sash for guiding the sash at an angle to the direction of sliding.

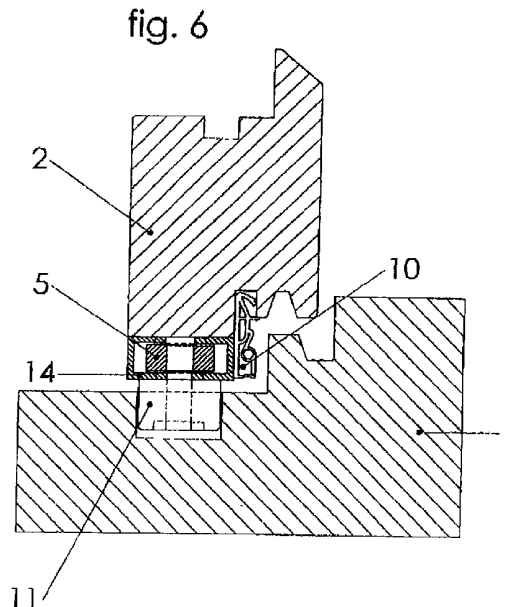
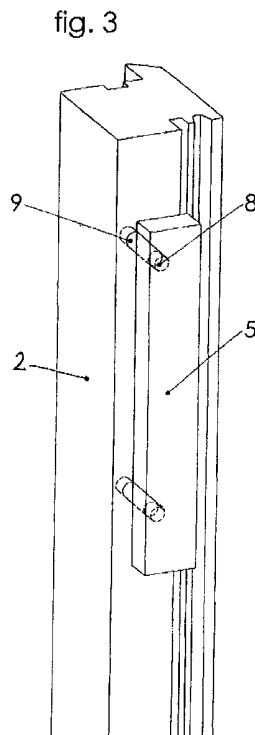


fig. 1

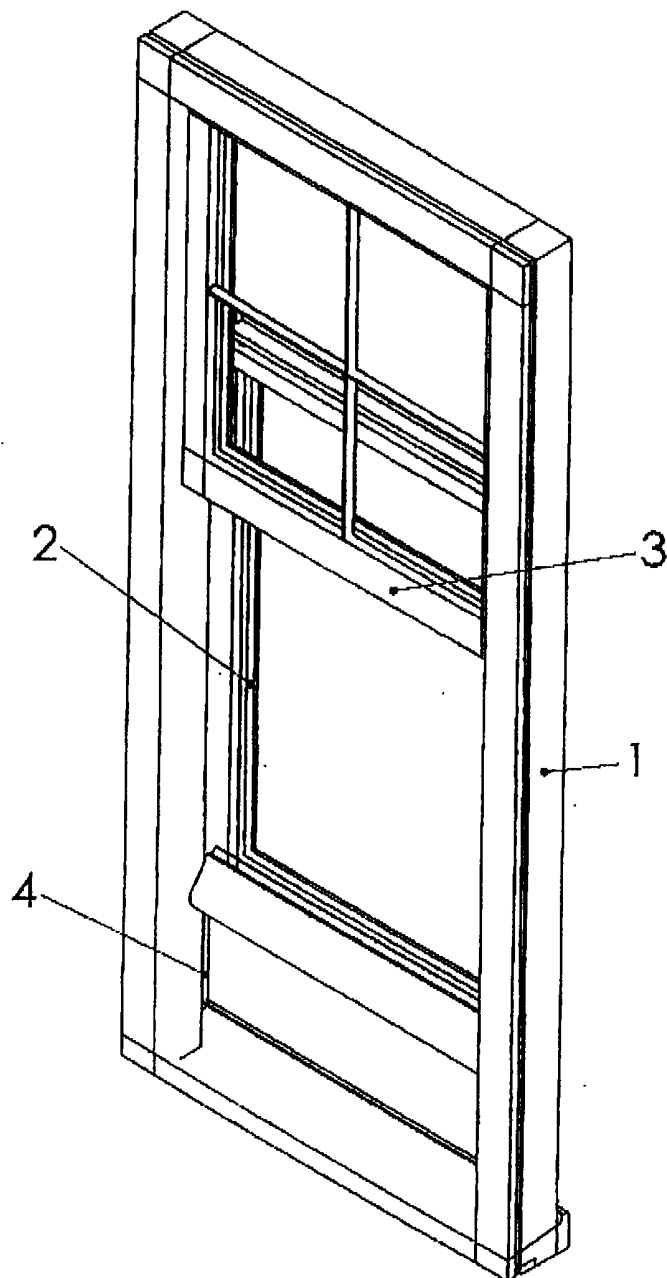


fig. 2

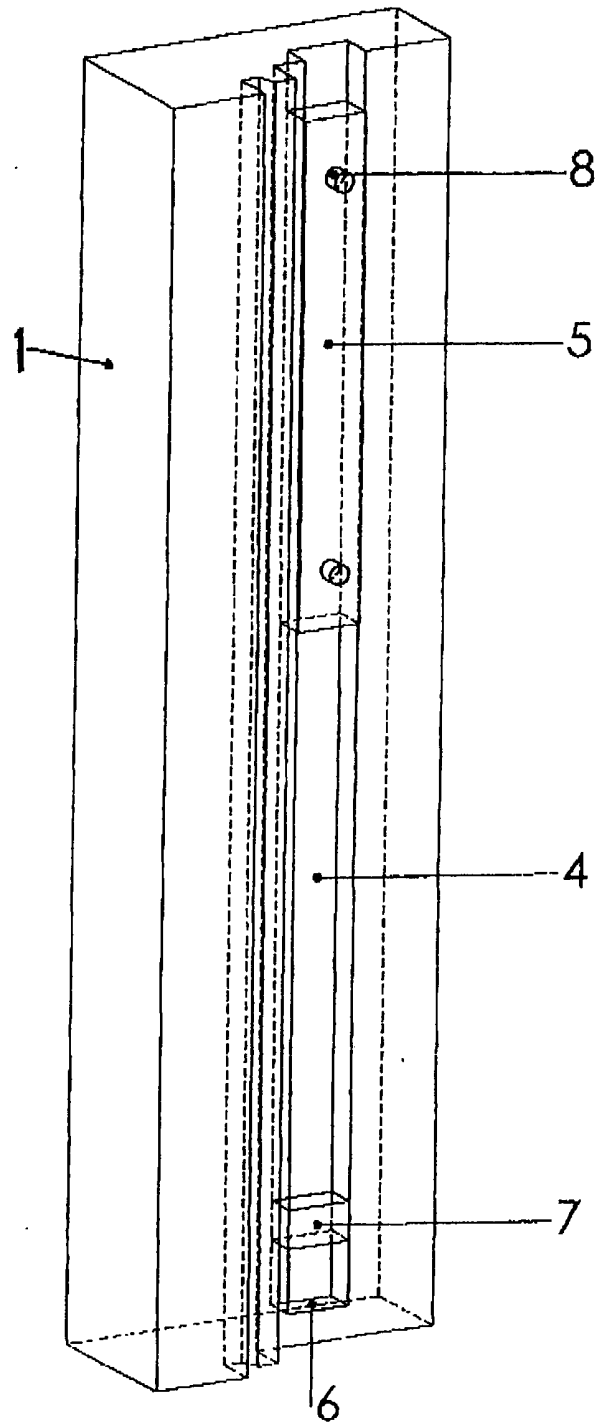


fig. 3

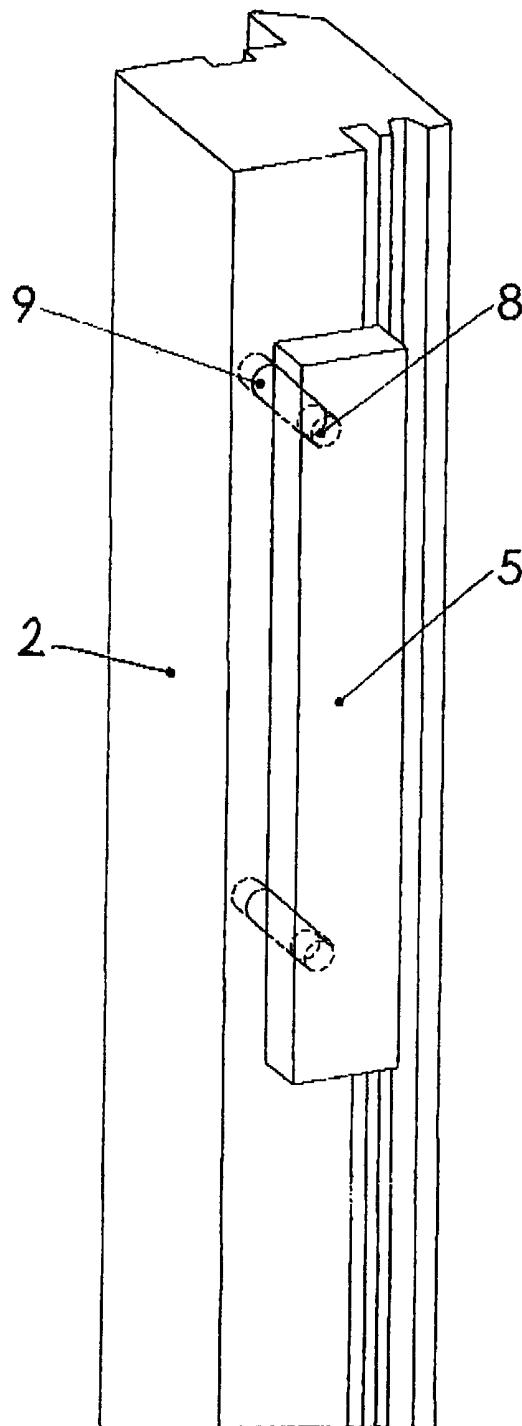


fig. 4

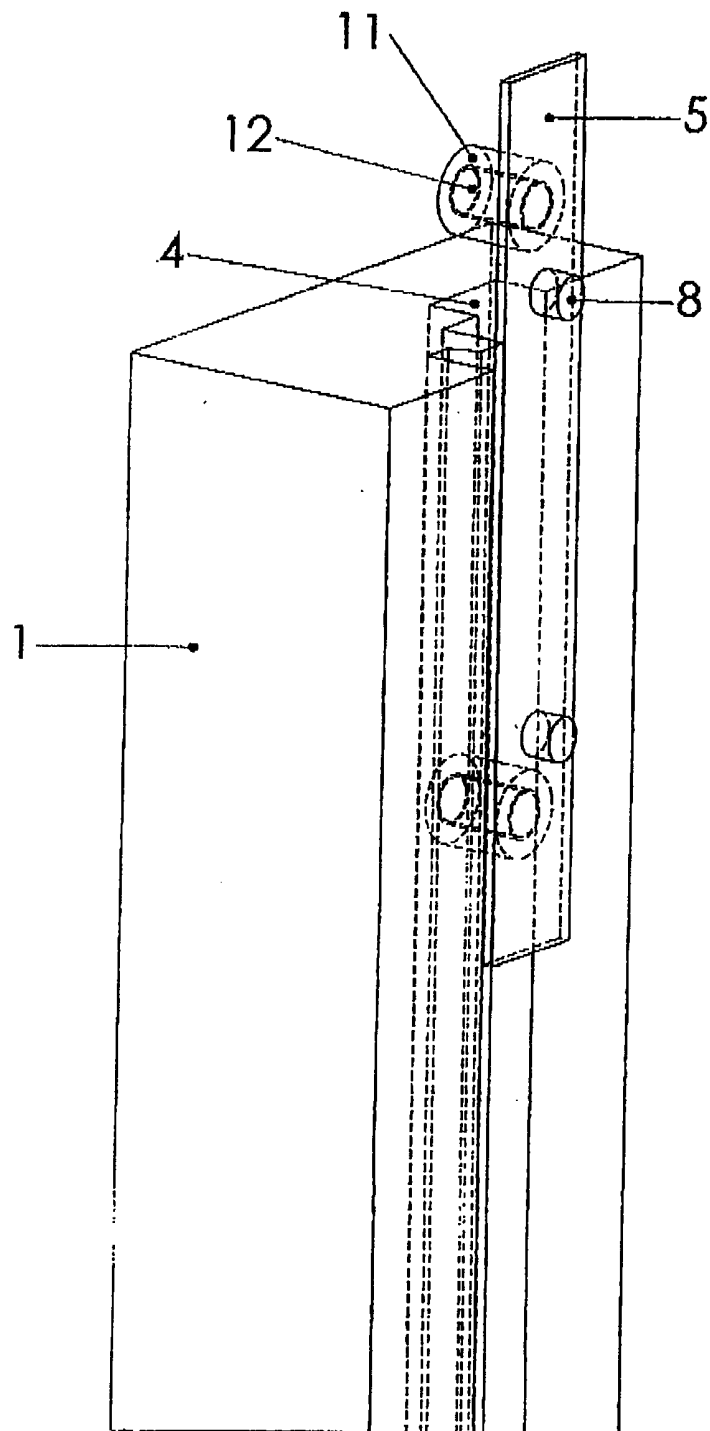


fig. 5

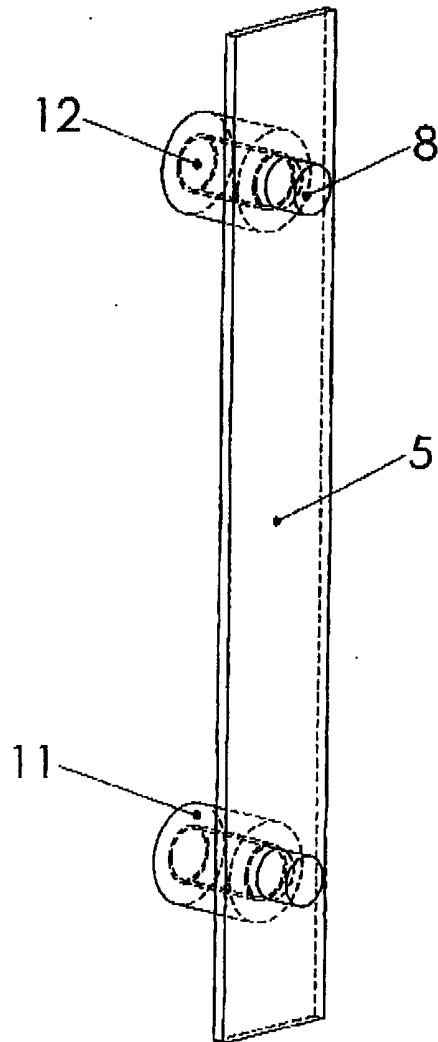


fig. 6

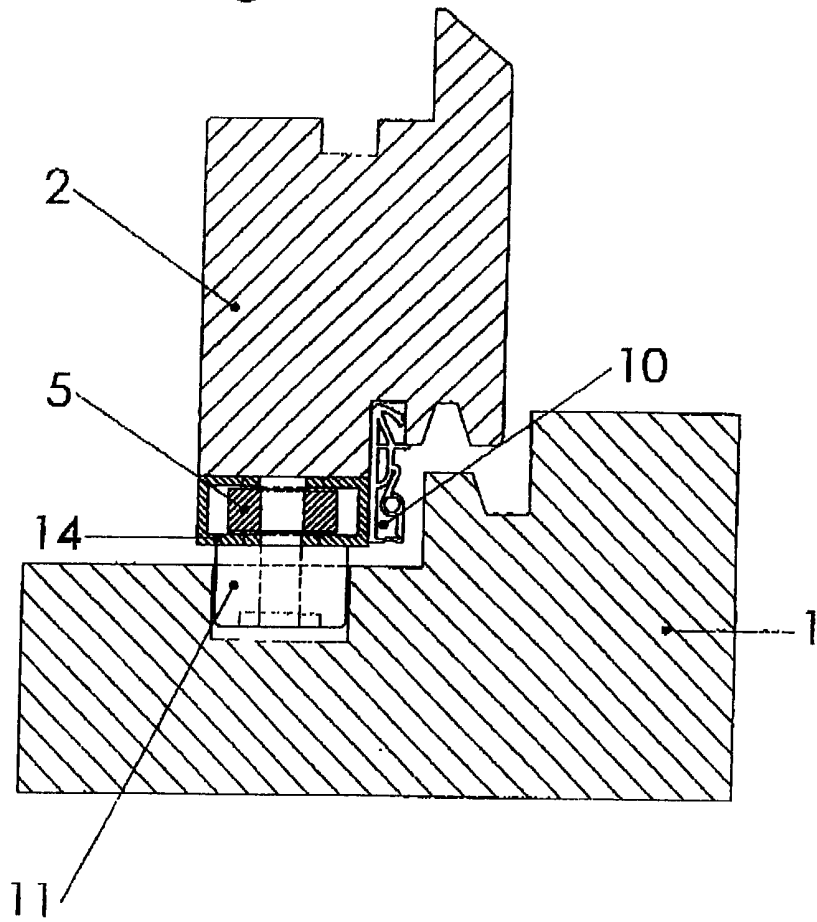


fig. 7

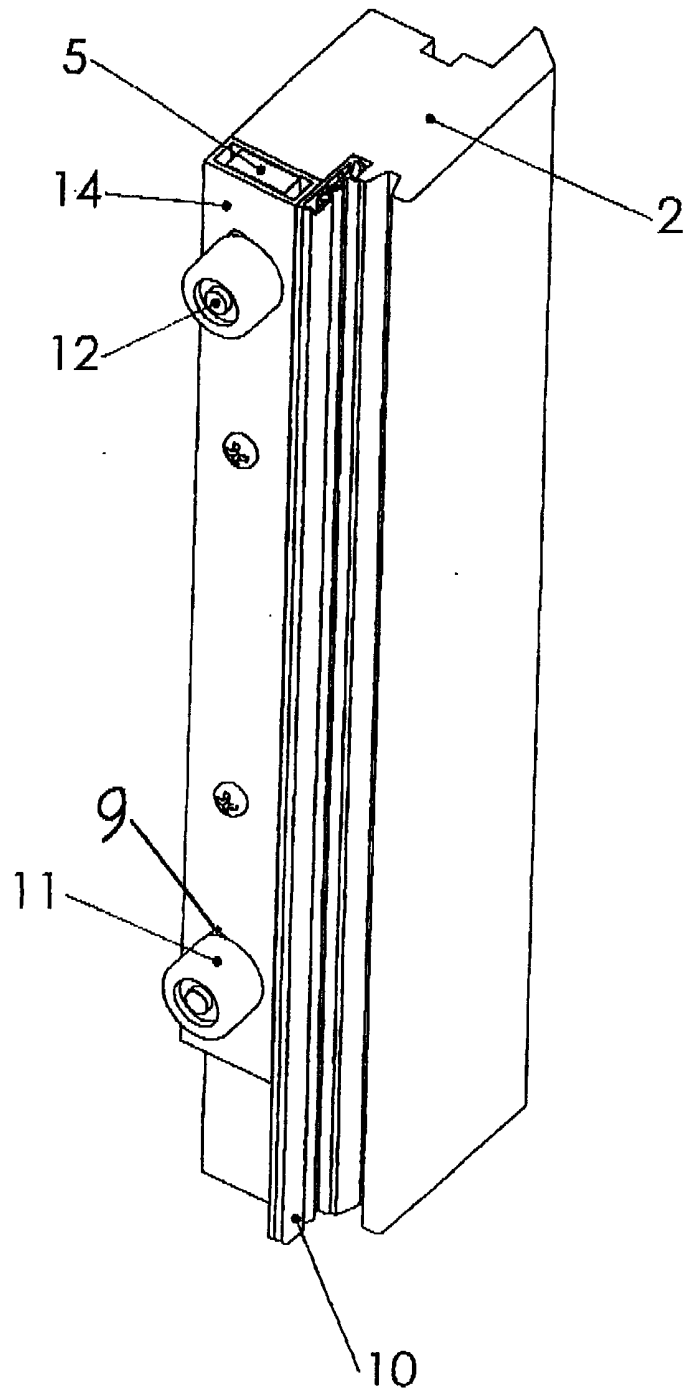


fig. 8

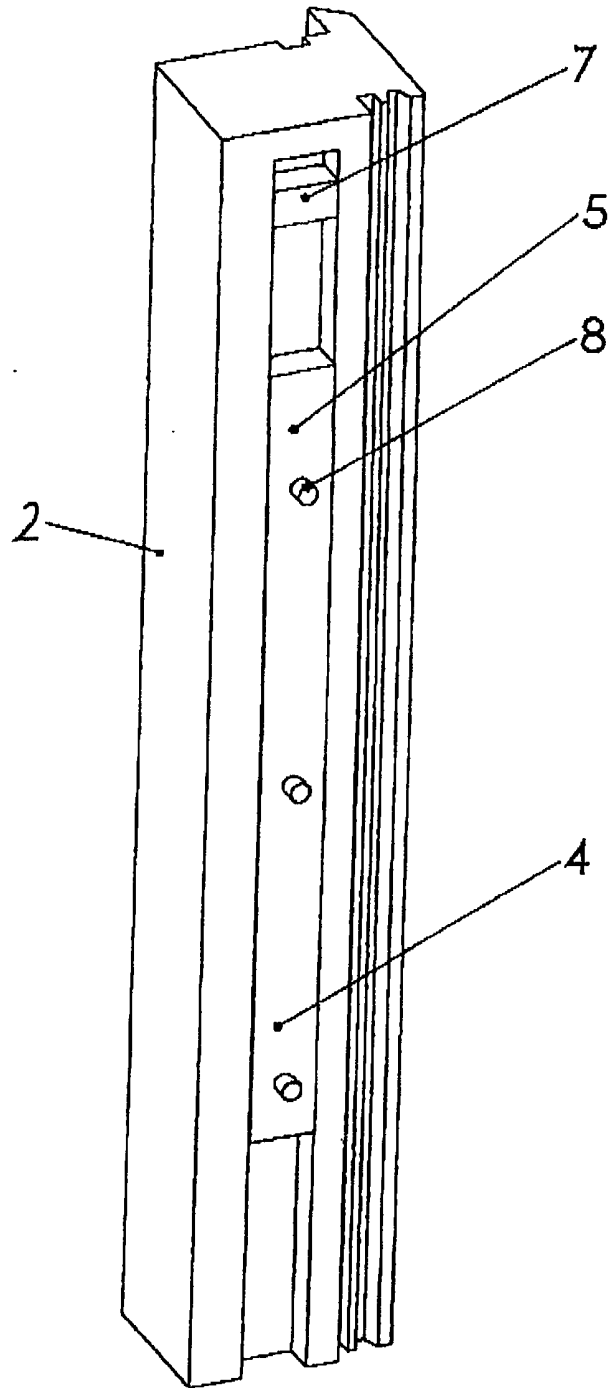
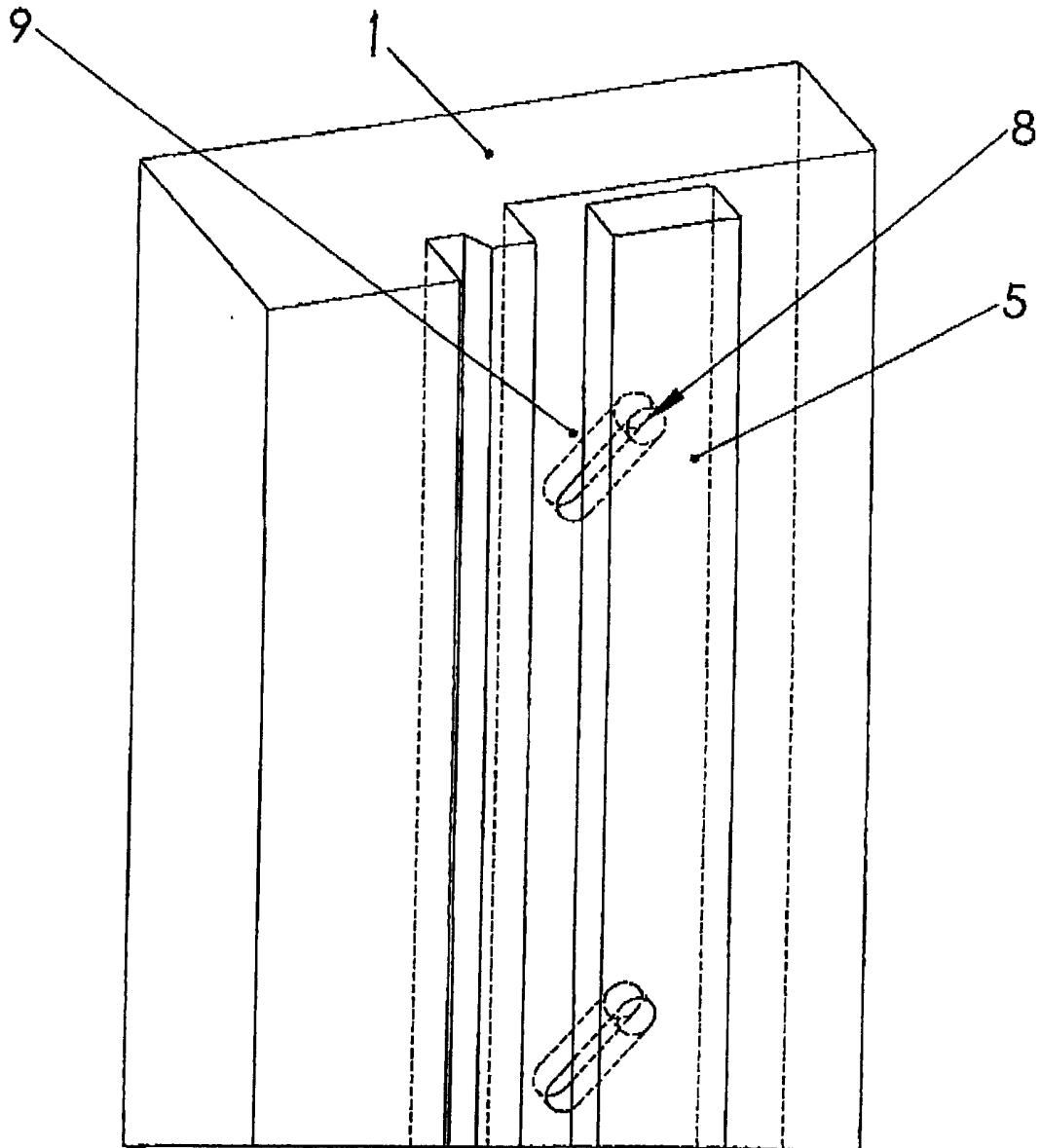


fig. 9



SASH WINDOW ASSEMBLY AND WINDOW GUIDING DEVICE

The invention relates to a sash window assembly, comprising a frame with a sash window being vertically slidable therein, and a guiding device between the frame and the sash window. The invention further relates to a guiding device for use in a sash window assembly.

Sash window assemblies, i.e. assemblies of a window frame to be connected to a wall, and an associated sash window which can be moved upwardly and downwardly relative to the frame, have been in use for over a century for many buildings, such as houses, factories, etc. Recently, solutions have become available to close the sash window essentially airtight and sound-proof with the aid of sealing means which are provided between the frame and the sash window, without the sealing structure causing any obstacle during the upward movement of the sash window in the frame, and preventing also the so-called "slanting" or tilting of the sash window in the frame, with the possible consequence of jamming thereof. For this purpose, pressing means are provided, which are configured to move the sash window or the sealing structure transversely to the direction of sliding over a relatively short distance which is sufficient to bring the sash window in the closed condition thereof with the sealing means placed in between in a sealing contact with the frame, and to make the sash window slidable without considerable friction while opening the sash window.

Such sash window assemblies are known, but have a number of important disadvantages.

The pressing means employed have large dimensions, and therefore cannot be provided in slim frame and window constructions without hiding the pressing means from view. For this reason, the pressing means cannot, or only with great effort, be fit into already existing sash window assemblies.

The present sash window assemblies have a complex composition, and therefore are expensive to manufacture. The costs further rise since the sash window assemblies every time must be made to a specific size. Also special provisions must be made in the frame as well as in the sash window to be able to accommodate the sliding arrangements.

The object of the present invention is to provide a sash window assembly which can be used easily in existing and new buildings.

Another object of the present invention is to provide a sash window assembly which is of a simple construction.

5 Still another object of the invention is to provide a sash window assembly, for which no or hardly any special arrangements need to be made.

At least one of the objects mentioned above is reached by the guiding device being configured to displace the sash window
10 transversely to the direction of sliding over a relatively small distance which is sufficient to bring the sash window at least in the closed condition thereof into a sealing contact with the frame with a sealing structure provided in between, and to bring the sash window, while opening it, out of the sealing contact with the frame. Thus, the
15 sash window, after opening thereof, can be slid without considerable friction.

In a preferred embodiment, the guiding device comprises a first guide connected to one of the frame and the sash window for guiding a body essentially in a vertical direction along one of the frame and
20 the sash window, and a second guide connected to the other one of the frame and the sash window for guiding the body essentially at an angle to the vertical direction along the other one of the frame and the sash window. The first guide and the second guide cooperate at a vertical side of the sash window. Also at the opposite side of the
25 sash window there is a combination of a first and a second guide. The first guide can be provided on or in the frame, the second guide then being provided on or in the sash window, but the first guide can also be provided on or in the sash window, the second guide then being provided on or in the frame. The first guide(s) allow(s) for the
30 sliding movement of the sash window relative to the frame in a vertical direction, while the second guide(s) allow(s) for the movement of the sash window relative to the frame at an angle to the vertical direction.

In a preferred embodiment, the first guide at the lower side
35 thereof is bounded by the end of the guide, or by a buffer element. In coming free from the end of the guide or the buffer element, the body has a preferred position initiated by the force of gravity, in which

the sash window, taking into account the sealing structure, comes free from the frame in order to reduce the friction. Conversely, the sash window is forced against the frame, with the sealing structure provided in between, after the movement of the body during the closing of the sash window is limited by the end of the guide or by the buffer element.

In a preferred embodiment, the first guide comprises a slot in which the body is movable. The slot can be formed in the frame or the sash window, or can be formed by an element to be provided on or in the frame or the sash window.

In a preferred embodiment, the body comprises a freely rotatable roller for a reduction of the friction during the movement of the body in the guide.

In a preferred embodiment, the second guide has a bounded length for limiting the mutual movement of the sash window and the frame in a direction at an angle to the vertical direction. In particular, the second guide extends at an angle of 30-60°, more specifically at an angle of about 45° to the vertical direction.

In a preferred embodiment, the second guide comprises a combination of a pin and a slot. The slot makes the pin move obliquely upwards when the sash window is opened. The slot can be straight or curved.

In a preferred embodiment, the second guide is part of a profile to be provided on the other one of the frame and the sash window, the profile preferably surrounding the body. The profile e.g. has a rectangular cross-section. The use of the profile makes the provision of a special profiling on the frame or the sash window unnecessary. Further, when provided on the sash window, the profile aids in sealing the sash window assembly well by increasing the stiffness of the sash window.

In a further preferred embodiment, a balancing device is provided for balancing the sash window in its open condition, as is common practice in the use of sash windows.

The invention will be explained in more detail from the following description of a preferred embodiment which is shown in the attached drawings, in which:

Fig. 1 shows a perspective view of a common sash window frame with a sash window and an upper window therein;

Fig. 2 shows a perspective view of a part of a frame of a sash window assembly according to the invention with a guide;

5 Fig. 3 shows a perspective view of a part of a sash window of a sash window assembly according to the invention;

Fig. 4 shows a perspective view of a part of a frame of a sash window assembly according to the invention with a guide having therein a body with rollers for a reduction of friction;

10 Fig. 5 shows a perspective view of an embodiment of a functional integration between a guide and rollers;

Fig. 6 shows a cross-sectional view of a sash window assembly according to the invention;

15 Fig. 7 shows a perspective view of a part of the sash window of the sash window assembly of Fig. 6;

Fig. 8 shows a perspective view of a part of a sash window of a sash window assembly according to the invention; and

Fig. 9 shows a perspective view of a part of a frame of a sash window assembly according to the invention.

20 In the different Figures, the same components or components having the same function are referred to with the same reference numerals.

Fig. 1 shows a frame 1 with a guide 4 for guiding a sash window 2 in a vertical direction while sliding it upwardly and downwardly.
25 The frame 1 also supports an upper window 3. Although in the embodiment shown the upper window 3 is fixed in the frame 1, the upper window 3 may be provided slidable along a guide in the frame 1 in a similar way as the sash window 2.

As Figs. 2 and 3 show, in a finite guide 4 in the frame 1 a body 30 5 which fits in the guide 4 can translate, in particular slide, essentially in a vertical direction. A sliding movement of the body 5 directed downwardly in the guide 4 is limited by the lower end of the body 5 contacting a closed end 6 of the guide 4, or by the body 5 abutting a buffer element 7 provided especially for this purpose. One 35 or more guiding means or pins 8 are provided on the body 5, which pins extend in corresponding guides or slots 9 provided in the sash window 2 and can slide therein, in the assembled condition of the sash window

assembly. The slots are directed at an angle of 30-60°, in particular at an angle of about 45° to the vertical direction. Between the frame 1 and the sash window 2 sealing structure 10 (see Fig. 6) are provided.

5 The embodiment shown in Figs. 2 and 3 operates as follows. The sash window 2 can be slid upwardly and downwardly freely along the frame 1, the body 5 translating through guide 4. The body 5 can move freely through the corresponding guides 9 with the guiding means 8, but has a preferred position initiated by the force of gravity, by
10 which during sliding open (sliding upwardly) the sash window 2 with its sealing structure 10 comes free from the frame 1 for reducing friction during sliding the window open. Here, the guiding means 8 are situated at the end of the guides 9, as shown in Fig. 3. In closing the sash window 2, the body 5 contacts the closed end 6 of the guide 4
15 or the buffer element 7 provided therein, before the sash window 2 is closed completely. A further closing of the sash window 2 is then only possible by moving the sash window 2 by means of the guides 9 along the guiding means 8 provided on the body 5, thereby forcing the sash window 2 against the frame 1 with the sealing structure 10 provided in
20 between.

It will be clear that starting from the principle which is at the basis of the construction according to the preceding description many variants of the sash window assembly according to the invention can be implemented by the skilled person. As Figs. 4-7 show, freely
25 rotatably supported rollers 11 can be situated between the body 5 and the guide 4 for reducing friction during sliding the sash window 2 up and down. The functions of the guiding means 8 on the body 5 and the axis of rotation 12 for the roller 11 can be integrated in one component, as illustrated by Fig. 5 in particular. As Figs. 6 and 7
30 show, the guides 9 can also be provided in a profile 14 which is fitted to the sash window 2. The profile 14 provided with guides 9 can possibly surround the body completely, only providing a passage for an axis of rotation 12 for the roller 11. In this way, a simple and durable construction is created, which functions surprisingly
35 reliable, among others since the use of springs has become superfluous. Also, the sash window 2 need not be provided any more with a profiling for accommodating the guiding device, so that a use

in particularly slim and already existing frame and sash window constructions is facilitated. Additionally, by the use of the profile the system adds a considerable stiffness to the sash window construction.

5 As shown in Figs. 8 and 9, it is also possible for the body 5 to slide in a guide 4 which is provided in a sash window 2, and for the guiding means 8 to extend in a slot 9 in the frame 1, contrary to the embodiment according to Figs. 2 and 3, where the different guides of the window guiding device are provided on opposing components. In the
10 case of Fig. 9 the body 5 is shown in a position in which the pin 8 is located at an end of the slot 9, the sash window 2 being free from the frame 1. A buffer element 7 is provided above the body 5.

Obviously, the invention is not limited to already installed sash window assemblies, but it can also be used in sash window
15 assemblies which are still to be installed.

CLAIMS

1. Sash window assembly, comprising a frame with a sash window being vertically slidable therein, and a guiding device between the frame and the sash window, the guiding device being configured to displace the sash window transversely to the direction of sliding over a relatively small distance which is sufficient to bring the sash window at least in the closed condition thereof into a sealing contact with the frame with a sealing structure provided in between, and to bring the sash window, while opening it, out of the sealing contact with the frame.
2. Sash window assembly according to claim 1, the guiding device comprising a first guide connected to one of the frame and the sash window for guiding a body essentially in a vertical direction along one of the frame and the sash window, and a second guide connected to the other one of the frame and the sash window for guiding the body essentially at an angle to the vertical direction along the other one of the frame and the sash window.
3. Sash window assembly according to claim 2, the first guide at the lower side thereof being bounded by the end of the guide.
4. Sash window assembly according to claim 2, the first guide at the lower side thereof being bounded by a buffer element.
5. Sash window assembly according to claim 2, 3 or 4, the first guide comprising a slot in which the body is movable.
6. Sash window assembly according to any of claims 2-5, the body comprising a freely rotatable roller.
7. Sash window assembly according to claim 2, the second guide having a limited length.
8. Sash window assembly according to claim 2, the second guide extending at an angle of 30-60° to the vertical direction.
9. Sash window assembly according to claim 8, the second guide extending at an angle of about 45° to the vertical direction.
10. Sash window assembly according to claim 2, the second guide comprising a combination of a pin and a slot.
11. Sash window assembly according to claim 2, the second guide being part of a profile to be provided on the other one of the frame and the sash window.

12. Sash window assembly according to claim 11, the profile completely surrounding the body.
13. Guiding device according to any of the preceding claims.



INVESTOR IN PEOPLE

Application No: GB 0328235.7
Claims searched: 1-13

Examiner: Dr Michael Gooch
Date of search: 31 March 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X, Y	X: 1, Y: 6	US 5619822 (TROMPERT) see guide wheel 7
X, Y	X: 1-5, 7-10, Y: 6	US 5185955 (PEDERSEN) see figure 6

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W:

E1J

Worldwide search of patent documents classified in the following areas of the IPC⁷:

E06B

The following online and other databases have been used in the preparation of this search report:

Online: EPODOC, PAJ, WPI