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## (54) Window closure for a hinging window.

(57) A window closure for a hinging window, in particular for use in a mobile living quarters unit such as a motorcar, boat, caravan and camper. The window closure comprises a first closure part (40) and a second closure part (53). The first closure part (40) is provided with means (46) for fastening to the window (3,31) and the second closure part (53) comprises means (54) for fastening to a frame (1) of the window (3). The window closure further comprises a bolt (50) which is connected at an end portion (51) to a shaft (52) and is fastened with rotation possibility about a centre line of the shaft (52). The shaft (52) extends substantially parallel to the window (3) at least in a closed position of this window (3). The bolt (50) comprises one of the two closure parts (40,53) at said end portion (51), eccentrically relative to the shaft (52). The components (40,50,53) of the window closure can cooperate so as to bring the window (3) into an at least partly closed position.

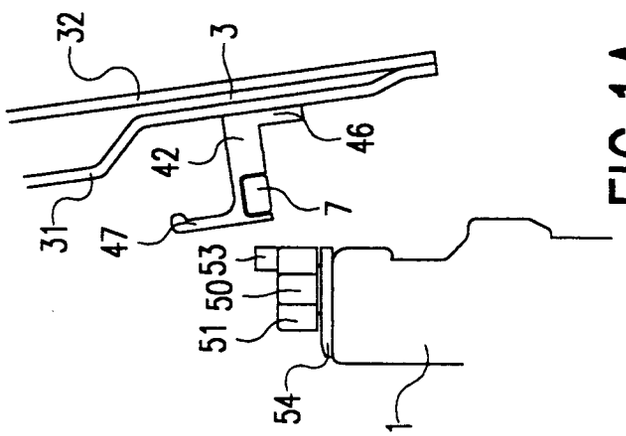


FIG.1A

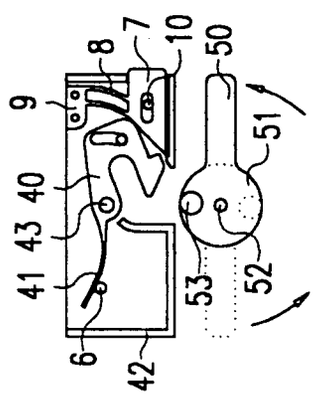


FIG.1B

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The invention relates to a window closure for a hinging window comprising a first closure part and a second closure part, the first closure part being provided with means for fastening to the window and the second closure part with means for fastening to a frame of the window, while the components of the window closure can cooperate so as to bring the window into an at least partly closed position.

The invention particularly relates to a window closure for a hinging window for use in a mobile living quarters unit such as a motorcar, boat, caravan and camper. The invention further relates to a framed window fitted with such a window closure.

A known window closure comprises a first closure part in the form of an elongate handle which is provided at one end with a stud which extends transverse thereto. The handle and the stud are arranged transverse to a shaft which is enclosed in a bush in which the shaft can rotate freely. The bottom of the bush is provided with a flange by means of which the first closure part can be mounted to the window. The second closure part comprises a retaining socket which is formed by two parallel plates positioned transverse to a flange. The retaining socket can be mounted on the window frame by means of the flange. The stud of the first closure part can be brought into the retaining socket by a rotary movement, whereby the window is closed. The window may be put in a ventilation position in that the stud is rested against the retaining socket instead of between the plates of it.

It is a disadvantage of the known window closure that a comparatively great force is exerted on the flange of the first closure part during closing of the window due to the comparatively strong torque which can be exerted with the handle. Especially when the frame of the window is provided with a rubber seal, whose counterforce is to be overcome, a comparatively great force is required for closing the window, while in addition the risk of overdosing the exerted force is considerable. The forces acting on the flange of the first closure part load the connection with the windowpane, which may impair the quality of the fastening and may eventually lead to the first closure part breaking off.

It is among the objects of the invention to provide a window closure of the kind mentioned in the opening paragraph which is more user-friendly and in which in particular the fastening of the constituent parts is less heavily loaded.

According to the invention, a window closure of the kind mentioned in the opening paragraph is for this purpose characterized in that the window closure further comprises a bolt, in that the bolt is connected at an end portion to a shaft and is fastened with rotation possibility about a centre line of the shaft, in that the shaft is substantially parallel to the window at least in a closed position of the window, and in that the bolt comprises one of the two closure parts at said end portion and arranged eccentrically relative to the shaft.

A windowpane is closed in a number of phases with the window closure according to the invention. The two closure parts are first brought together with the closure part on the bolt facing towards the other closure part. The window is not yet fully closed then, but is in a ventilation position. Then the bolt is rotated about its shaft whereby the two closure parts are moved from the side of said end portion facing the window to the opposite side. The accompanying radial movement presses the window against the frame and closes it hermetically.

Due to the lever action of the bolt, the window closure according to the invention can be closed by a comparatively light rotary movement of the bolt, even if the counterforce of any sealing is to be overcome. The leverage of the bolt is mainly determined by the length of the bolt and the degree of eccentricity of the closure part forming part thereof and may be preset for a desired value by a suitable choice of these dimensions, whereby a very user-friendly window closure is obtained.

Moreover, the maximum radial movement of the closure parts in the window closure according to the invention is fixed for a given eccentricity of the closure part on the bolt. Consequently, it is practically impossible to overdose the force which is exerted on the closure parts while closing the window. The fastening of the individual components of the window closure to the window or the frame thereof is thus less heavily loaded.

A special embodiment of the window closure according to the invention is characterized in that the bolt comprises the second closure part and in that the bolt is connected via the shaft to a flange for fastening to the frame of the window. In this embodiment, the bolt is preferably mounted to the inside of the frame. The bolt is then readily accessible to the user and the shaft of the bolt is substantially parallel to the window at least in the closed position thereof, which is desirable.

In a preferred embodiment, the window closure according to the invention is provided with means for locking the two closure parts in an interconnected position. When the two closure parts are locked, the window can only be put in the fully closed position and in the ventilation position, depending on the position of the bolt. The window is thus protected against being fully opened in either position.

The invention further relates to a framed window comprising a window frame which is externally provided with an L-shaped profile and internally comprises an opening which is circumferentially fitted with a rubber or at least a rubber-like seal, and a hinging window which is provided in the opening and is hinged to one side

of the frame, which hinging window is provided with a window closure according to the invention in which the bolt comprises the second closure part of the window closure and is fastened to the inside of the frame.

The invention will now be explained in more detail with reference to an embodiment and a drawing, in which:

Fig.1A is a first cross-section of an embodiment of the window closure according to the invention fastened to a window which is in the open position;

Fig.1B is a second cross-section of the embodiment of the window closure of Fig. 1 in the open position;

Fig. 2A is a first cross-section of the window closure of Fig. 1 fastened to a window in a ventilation position;

Fig. 2B is a second cross-section of the window closure of Fig. 1 in the ventilation position;

Fig. 3A is a first cross-section of the window closure of Fig. 1 fastened to a window in a closed position; and

Fig. 3B is a second cross-section of the window closure of Fig. 1 in the closed position.

The figures are purely diagrammatical and not drawn to scale. Some dimensions are particularly strongly exaggerated for reasons of clarity. Corresponding parts are given the same reference numerals in the figures as much as possible.

Fig.1A shows a wall 1 of a camper vehicle with an opening 2 which can be closed off with a window 3. The window 3 is connected to the wall 1 (outside the drawing) by means of a hinge at the upper side of the opening 2. The window in the present case is of the double-glazed type, with an inner pane 31 and an outer pane 32. The invention, however, is equally applicable to single-glazed windows. The window opening is circumferentially provided with a rubber-like seal, i.e. a seal of rubber or some other resilient material which adequately counteracts the ingress of moisture, which is not shown in the drawing for the sake of clarity. The window 3 is provided with a window closure by means of which it can be closed.

The window closure comprises a first closure part in the form of a retaining socket 40, see Fig. 1B, which is accommodated in a housing 42. The retaining socket 40 is connected to the housing 42 via a shaft 43 and is fastened to the shaft 43, pivotable about a centre line of the shaft. The retaining socket 40 rests with a resilient end 41 against a stud 6 fastened in the housing 42 and can be set in an opened position by means of a push button 7, the open end 44 of the retaining socket 40 facing an opening 45 in the housing in that case. The push button 7 is fastened to an inner side of the housing 42 via a blade spring 8 and a flange 9, and is guided by a cam 10. The blade spring 8 ensures that the push button will always return to its initial position after being pressed.

The housing 42 is externally provided with a flange 46 and is fastened thereby to the inner pane 31 of the window 3, by means of a common screw connection (not shown). At the opposite side, the housing 42 is provided with a handle 47 which extends substantially parallel to the window 3.

The window closure according to the invention further comprises a bolt 50 which is mounted at an end portion 51 to a shaft 52 with rotation possibility about a centre line. The bolt is connected to the shaft here via a torsion spring (not shown). The torsion spring ensures that the bolt 50 will always return to its initial position as shown in the drawing after opening of the window 3. The end portion 51 of the bolt 50 is somewhat widened so as to accommodate a second closure part of the window closure in the form of a stud 53 which has an external diameter smaller than the internal width of the retaining socket 40 and is arranged eccentrically relative to the shaft 52. The bolt 50 is connected to the wall 1 via a flange 54 at the lower side of the opening 2.

The window 3 is closed in a number of stages with the window closure according to the invention. First the retaining socket 40 is moved over the stud 53 of the bolt by means of the handle 47 so that the stud 53 enters the retaining socket, see Figs. 2A and 2B, and the resilient end 41 of the retaining socket straightens itself. The two closure parts 43, 50 are then in mutual engagement, but the window 3 is not fully closed. The window is now in a so-called ventilation position.

To close the window 3, the bolt 50 is turned half a stroke about its shaft 52, see Figs. 3A and 3B. The second closure part 53 is displaced thereby from the side of the end portion 51 facing the window to the opposite side. The accompanying radial movement of the mutually engaging closure parts, indicated diagrammatically with arrow 11, presses the window 3 against the wall 1 and closes it hermetically. To open the window, the push button 7 is to be pressed, whereby the retaining socket 40 opens and the window can be pushed open. The bolt 50 rotates automatically back into the initial position of Fig. 1, in which the stud 53 faces the window 3, thanks to the torsion spring of this bolt.

The force exerted on the various parts of the window closure and on fastenings thereof is limited by the maximum radial movement 11, which depends on the degree of eccentricity of the stud and which may thus be set in advance. In addition, this force lies substantially in a linearly extended direction of the most vulnerable fastening, i.e. that between the flange 46 and the comparatively weak inner pane 31, in contrast to the case

of the known window closure, which means that the fastening to the window is less heavily loaded. The invention thus offers a durable and user-friendly window closure.

Although the invention has been described with reference to only a single embodiment, it will be obvious that the invention is by no means limited to the example given. Many more variations and implementations are possible to those skilled in the art within the scope of the invention. More in particular, mating closure parts of shapes different from those of the stud and retaining socket may be used, or the two closure parts may be interchanged. Instead of the retaining socket, for example, a plate may alternatively be used which can be hooked behind the stud by a rotary or sliding movement. Furthermore, the bolt may be fastened not to the window frame, but to the window itself, in which case the bolt comprises the first closure part. This has the advantage that the bolt in that case does not constitute an obstacle at the otherwise smooth frame of the window opening.

The term "window" should also be given a wide interpretation in the present Application so that it also embraces, for example, luggage gates and hinged doors. The invention can be advantageously applied to these as well.

Moreover, the window closure may be fitted with means for locking the two closure parts in a mutually engaging position. These means comprise, for example, a key and lock with which in the embodiment described the movement of the retaining socket around the shaft or the movement of the push button can be blocked. The window is protected against opening in that case; it can only be put in a ventilation position and in a fully closed position.

## Claims

1. A window closure for a hinging window comprising a first closure part and a second closure part, the first closure part being provided with means for fastening to the window and the second closure part with means for fastening to a frame of the window, while the components of the window closure can cooperate so as to bring the window into an at least partly closed position, characterized in that the window closure further comprises a bolt, in that the bolt is connected at an end portion to a shaft and is fastened with rotation possibility about a centre line of the shaft, in that the shaft is substantially parallel to the window at least in a closed position of the window, and in that the bolt comprises one of the two closure parts at said end portion and arranged eccentrically relative to the shaft.

2. A window closure as claimed in Claim 1, characterized in that the bolt comprises the second closure part and in that the bolt is connected via the shaft to a flange for fastening to the frame of the window.

3. A window closure as claimed in Claim 2, characterized in that the first closure part comprises a retaining socket and the second closure part comprises a stud mating with said socket and placed at the end of the bolt.

4. A window closure as claimed in any one of the preceding Claims, characterized in that the window closure is provided with means for locking the two closure parts in an interconnected position.

5. A window closure as claimed in any one of the preceding Claims, characterized in that the bolt is connected to the shaft via a torsion spring.

6. A framed window comprising a window frame which is externally provided with an L-shaped profile and internally comprises an opening which is circumferentially fitted with a rubber or at least a rubber-like seal, and comprising a hinging window which is provided in the opening and is hinged to one side of the frame, characterized in that the hinging window is provided with a window closure as claimed in any one of the preceding Claims, and in that the bolt comprises the second closure part of the window closure and is fastened to the inside of the frame.

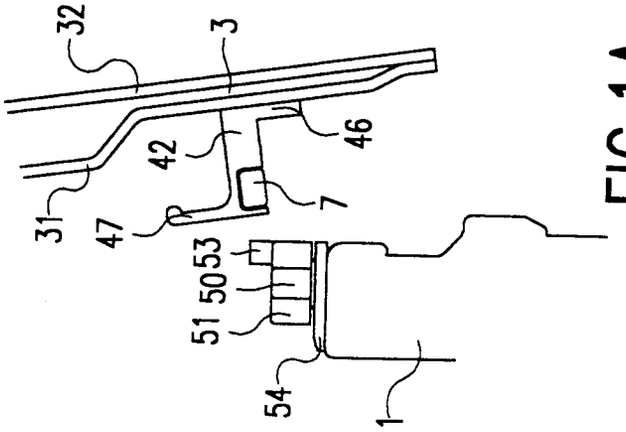


FIG.1A

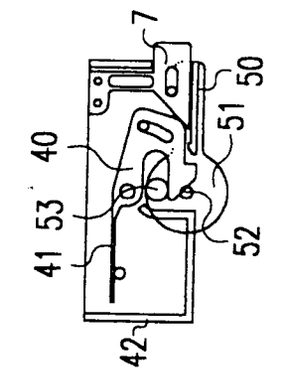


FIG.2B

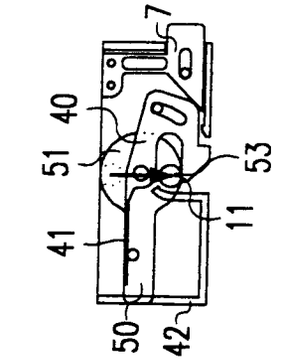


FIG.3B

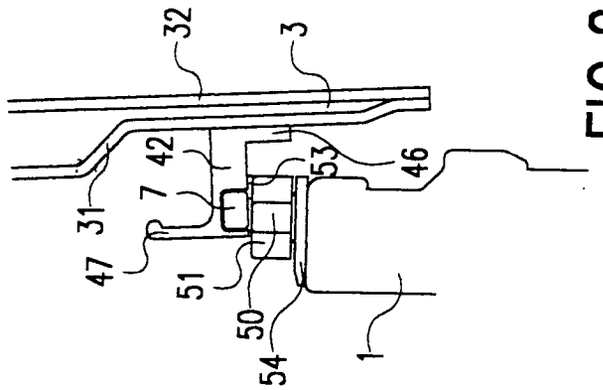


FIG.2A

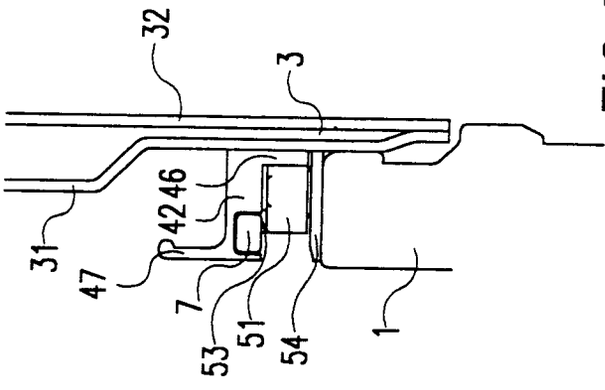


FIG.3A

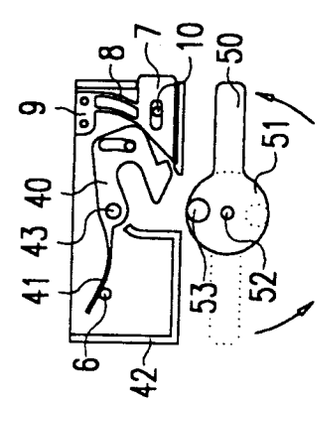


FIG.1B

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# EUROPEAN SEARCH REPORT

Application Number
EP 93 20 3563

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.5) |
|---|---|---|---|
| A | DE-A-28 19 733 (GEBR. UHL)<br>* the whole document * | 1,6 | E05C3/04 |
| A | WO-A-92 03658 (BAXTER INT.)<br>* the whole document * | 1 | |
| A | US-A-3 277 677 (A. HURVITZ)<br>* the whole document * | 1,6 | |

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

E05C

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| BERLIN | 7 March 1994 | Krabel, A |

CATEGORY OF CITED DOCUMENTS

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