



(11) **EP 2 017 419 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.01.2009 Bulletin 2009/04

(51) Int Cl.:
E05D 15/56 (2006.01)

(21) Application number: **07381052.5**

(22) Date of filing: **18.07.2007**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**
Designated Extension States:
AL BA HR MK RS

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Remarks:
Amended claims in accordance with Rule 137(2)
EPC.

(54) **Upward diagonal movement guiding mechanism for liftable sliding windows and doors**

(57) The present invention relates to an upward diagonal movement guiding mechanism for liftable sliding windows and doors, which avoids having to move the pane vertically and then horizontally in order to separate it from the sealing joints, because the upward diagonal movement guiding mechanism consists of a guide rail (7) with at least one roller (8) that is guided along a channel thereof and which confers the pane an upward diag-

onal movement, being actuated this movement from the side of the sliding window or door by means of a lever (2) that transmits the movement to a return bracket (3.2), which transforms the vertical movement into a horizontal traction movement by means of a traction rod (5) that pushes the roller (8) towards the aforementioned channel.

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to an upward diagonal movement guiding mechanism for liftable sliding windows and doors, which avoids having to move the pane vertically and then horizontally in order to separate it from the sealing joints.

[0002] Due to its special configuration, the upward diagonal movement guiding mechanism consists of a guide rail with at least one roller that is guided along a channel thereof and which confers the pane an upward diagonal movement.

[0003] Additionally, this movement is actuated from the side of the sliding window or door by means of a lever that transmits the movement to a return bracket, which transforms the vertical movement into a horizontal traction movement by means of a traction rod that pushes the roller towards the aforementioned channel.

BACKGROUND OF THE INVENTION

[0004] Liftable sliding windows or doors that include one or several panes that can be lifted vertically parallel to their plane, and then moved horizontally by means of one or several rollers that slide along a guide rail installed in the window or door frame, are well known in the current state of the art.

[0005] Said systems generally consist of a cam assembly that moves the pane vertically, while the horizontal movement is enabled by actuating a lever.

[0006] In this way, due to the fact that between the outer perimeter edge of the pane and the inner perimeter of the frame there are joints that guarantee hermeticity, when the door or window is closed, the friction generated prevents vertical movement, in addition to the consequent wear of the joints, which can no longer guarantee adequate hermeticity during the service life of the door or window.

[0007] The aforementioned systems also require an additional actuating lever in order to move the door or window pane horizontally.

[0008] All these drawbacks are resolved by the present invention described below.

DESCRIPTION OF THE INVENTION

[0009] The present invention relates to an upward diagonal movement guiding mechanism for liftable sliding windows and doors that allows said doors or windows to be lifted diagonally, thereby avoiding the friction generated by first lifting the door or window vertically and then horizontally.

[0010] The mechanism consists of an actuating lever which, by means of transmission mechanisms, horizontally moves a traction rod that slides along a case on the lower side of the window or door pane frame.

[0011] Inside the case and underneath the traction rod there is a guide rail with at least one roller, so that when the traction rod moves horizontally, an actuating cylinder inside the traction rod pushes against a slanting surface on the guide rail and the roller axis, solidly joined to the guide rail, descends along a slanting channel within the case.

[0012] In this way, the horizontal traction force is broken down into two oblique forces that produce the elevation of the traction rod relative to the guide rail, and the descent of said guide rail along the slanting channel within the case.

[0013] In this way, the pane moves upwards in the direction of the slanting channel within the case and opposite to the roller movement, thereby achieving the upward diagonal movement of the pane over the outer door or window frame, due to the roller being in constant contact with said outer door or window frame.

[0014] Therefore, the door or window pane, which rests upon the case, moves upwards diagonally, through the sole actuating movement of a lever, there being no need for double movement, first vertical and then horizontal, which would entail vertical friction and consequent sealing joint wear.

[0015] In order to lower the door or window pane the lever must be actuated in the opposite direction, due to which the traction rod moves horizontally in the same direction, the actuating cylinder thereby descending along the slanting surface within the guide rail.

[0016] When this movement takes place, the guide rail is introduced into the case, as said guide rail cannot support the weight of the pane, due to the fact that the guide rail roller axis slides along the slanting channel until the actuating cylinder returns to its initial position and the traction rod rests upon the guide rail.

[0017] In summary, the present invention relates to an upward diagonal movement guiding mechanism for liftable sliding windows and doors characterized in that it consists of an actuating lever which, by means of a transmission mechanism, moves horizontally relative to at least one traction rod that slides along a case on the lower side of the window or door pane frame, where inside each case and underneath the traction rod there is a guide rail with at least one roller, in such a way that when the traction rod moves horizontally, an actuating cylinder thereof pushes against a slanting surface within the guide rail and the roller axis, solidly joined to said guide rail, descends along a slanting channel within the case, thereby lifting the pane in the direction of the slanting channel and opposite to the roller's movement, in such a way that the pane moves upwards diagonally over the outer door or window frame.

DESCRIPTION OF THE DRAWINGS

[0018] This specification is complemented by a set of drawings that illustrate the example of preferred embodiment of the invention in an unlimitative manner.

Figure 1.- Shows a sectional view of the upward diagonal movement guiding mechanism for liftable sliding windows and doors installed on one of the sides of the pane and the lower part of the door or window in its non-lifted position, indicating the forces transmitted to each of the elements by means of arrows.

Figure 2.- Shows a sectional view of the lower part of the door or window in the position after the mechanism has been actuated, whereby the door or window has been lifted, indicating the forces transmitted to each of the elements by means of arrows.

PREFERRED EMBODIMENT OF THE INVENTION

[0019] In accordance with the above, the present invention relates to an upward diagonal movement guiding mechanism for liftable sliding windows and doors which avoids having to move the pane vertically and then horizontally in order to separate it from the sealing joints.

FIRST EXAMPLE OF PREFERRED EMBODIMENT

[0020] The mechanism installed on the door or window pane (1) frame (1.1) has an actuating lever (2), which in this example of preferred embodiment is installed on one of the sides of the pane (1) and joined to a transmission mechanism (3), which in this example of preferred embodiment consists of an ascending vertical traction mechanism (3.1) that transmits the movement to a return bracket (3.2).

[0021] Said return bracket transforms the vertical movement into a horizontal traction movement by means of a rod (5) that slides over a case (6).

[0022] Said case (6) contains a guide rail (7) with at least one roller (8) axis (8.1).

[0023] In the pane's non-lifted position (1), a slanting surface (5.1) of the traction rod (5) is placed antagonistically to a slanting surface (7.1) of the guide rail (7), where the slanting surface (5.1) of the traction rod (5) has an actuating cylinder (5.2).

[0024] In this way, when the horizontal section of the return bracket moves horizontally, transmitting this movement to the traction rod (5), the actuating cylinder (5.2) pushes against a slanting surface (7.1) of the guide rail (7), in such a way that the roller (8) axis (8.1) slides along a slanting channel (6.1) within the case (6).

[0025] The horizontal traction force is thereby broken down into two oblique forces that produce the elevation of the traction rod (5) relative to the guide rail (7), and the descent of said guide rail (7) together with the rollers (8) along a slanting channel (6.1) within the case (6).

[0026] In this way, the pane (1), which rests upon the case (6), is lifted in the direction of the slanting channel (6.1) thereof and opposite to the roller (8) movement, in such a way that the pane (1) moves upwards diagonally over the outer door or window frame (4).

[0027] In order to lower the window or door pane (1)

the lever (2) must be actuated in the opposite direction, whereby the traction rod (5) also moves horizontally and the actuating cylinder (5.2) descends along the slanting surface (7.1) of the guide rail (7), which is introduced into the case (6) as a result of the weight of the pane (1), due to the fact that the roller (8) axis (8.1) slides along a slanting channel (5.2) within the case (6) until the actuating cylinder (5.2) returns to its initial position and the traction rod (5) rests upon the guide rail (7).

SECOND EXAMPLE OF PREFERRED EMBODIMENT

[0028] In the second example of preferred embodiment, the upward diagonal movement guiding mechanism for liftable sliding windows and doors has two traction rods (5), the first (5) of which is joined to the transmission mechanism (3) and the second (5) joined to the first (5) by means of a connection flange (9). Each of the traction rods (5) slide over a case (6) containing a guide rail (7) that supports each of the two roller (8) axes (8.1).

[0029] In the pane's non-lifted position (1), each of the traction rods (5) have two slanting surfaces (5.1) placed antagonistically to the slanting surfaces (7.1) of each guide rail (7), each slanting traction rod (5) surface (5.1) having an actuating cylinder (5.2).

[0030] In this way, when the horizontal section of the return bracket moves horizontally, transmitting this movement to the traction rods (5) joined by the connection flange (9), the actuating cylinders (5.2) push against the slanting guide rail (7) surfaces (7.1), in such a way that the roller (8) axes (8.1) slide along the slanting channels (6.1) within the cases (6).

[0031] The descending movement of the pane (1) is identical to that described in the first example of preferred embodiment.

[0032] The essence of this invention is not altered by variations in materials, shape, size and assembly of the constituent components, and has been described in an unlimitative manner, so as to allow its reproduction by a person skilled in the art.

Claims

1. Upward diagonal movement guiding mechanism for liftable sliding windows and doors, **characterized in that** it includes an actuating lever (2) which, by means of a transmission mechanism (3), moves horizontally relative to at least one traction rod (5) that slides over a case (6) installed on the lower part of the window or door pane (1) frame (1.1), where inside each case (6) and underneath the traction rod there is guide rail (7) with at least one roller (8), so that when the traction rod (5) moves horizontally, an actuating cylinder (5.2) present in the traction rod (5) pushes against a slanting surface (7.1) of the guide rail (7), and the roller axis (8.1), solidly joined to the guide rail (7), descends along a slanting channel

(6.1) within the case (6), thereby lifting the pane (1) in the direction of the slanting channel (6.1) and opposite to the roller movement (8), in such a way that the pane (1) moves upwards diagonally over the outer door or window pane frame (4).

2. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** the actuating lever (2) is installed on one of the sides of the pane (1), and the transmission mechanism (3) consists of an ascending vertical traction mechanism (3.1) that transmits the movement to a return bracket (3.2) which transforms the vertical movement into the horizontal movement of the traction rod (5).
3. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** the lever (2) must be actuated in the opposite direction in order to lower the window or door pane (1), as a result of which the traction rod (5) also moves horizontally and the actuating cylinder (5.2) descends along a slanting surface (7.1) of the guide rail (7), which is introduced into the case (6) as a result of the weight of the pane (1), due to the fact that the roller (8) axis (8.1) slides along a slanting channel (5.2) within the case (6) until the actuating cylinder (5.2) returns to its initial position and the traction rod (5) rests upon the guide rail (7).
4. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** it has two traction rods (5), the first (5) of which is joined to the transmission mechanism (3) and the second (5) joined to the first (5) by means of a connection flange (9).
5. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** it has a guide rail (7) which supports each of the two roller (8) axes (8.1).
6. Upward diagonal movement guiding mechanism for liftable sliding windows and doors, according to claim 1, **characterized in that** each guide rail (7) supports each of the two roller (8) axes (8.1).

Amended claims in accordance with Rule 137(2) EPC.

1. Upward diagonal movement guiding mechanism with an actuating lever (2), a traction rod (5), a case (6) and a guide rail (7) wherein the traction rod (5) moves horizontally when actuated by the lever and the transmission mechanism (3) and the traction rod (5) slides over a case (6) installed on the lower part

of a window or door pane (1) frame (1.1), **characterized in that** inside each case (6) and underneath the traction rod the guide rail (7) has at least one roller (8), so that when the traction rod (5) moves horizontally, an actuating cylinder (5.2) present in the traction rod (5) pushes against a slanting surface (7.1) of the guide rail (7), and the roller axis (8.1), solidly joined to the guide rail (7), descends along a slanting channel (6.1) within the case (6), thereby lifting the pane (1) in the direction of the slanting channel (6.1) and opposite to the roller movement (8), in such a way that the pane (1) moves upwards diagonally over the outer door or window pane frame (4).

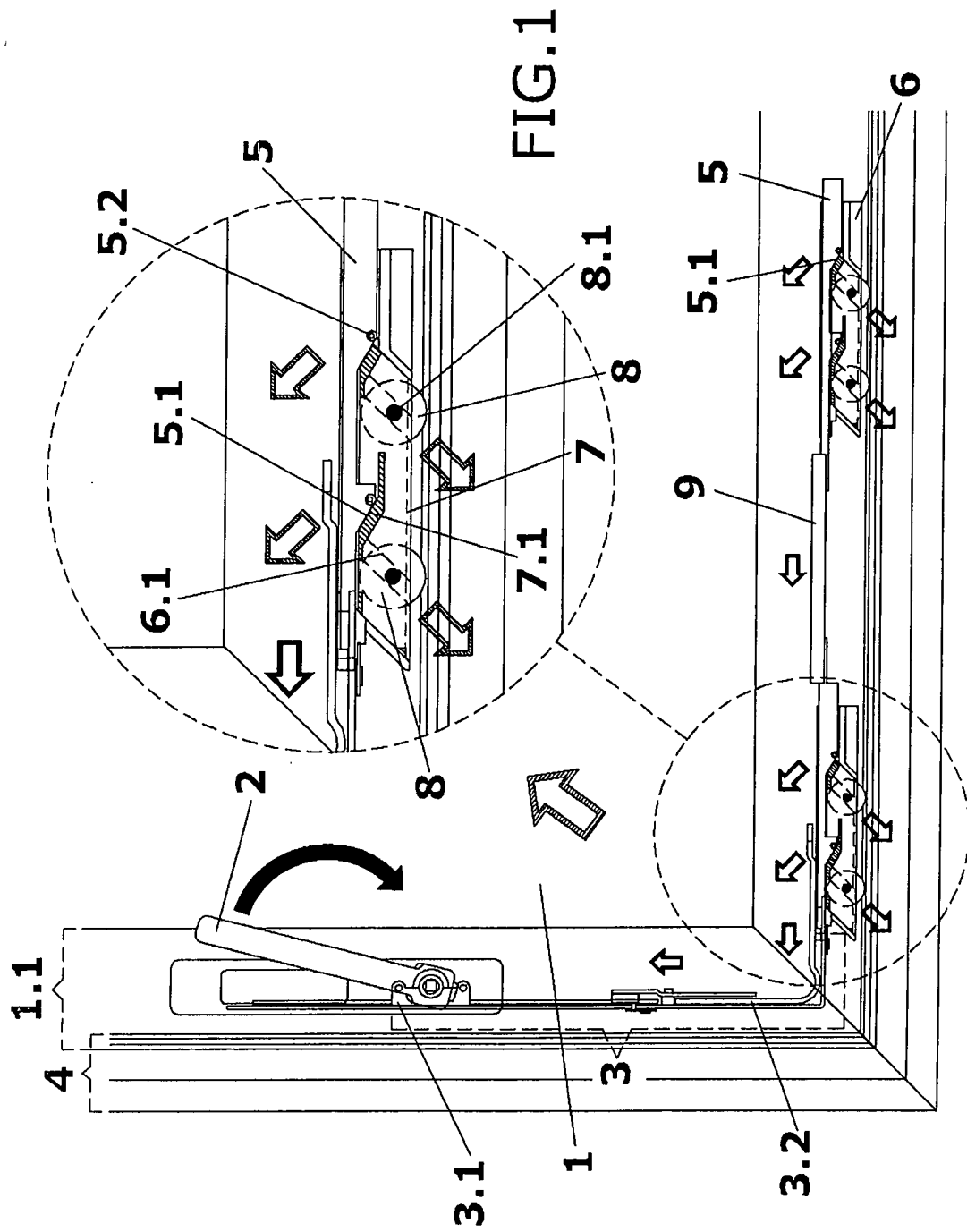
2. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** the actuating lever (2) is installed on one of the sides of the pane (1), and the transmission mechanism (3) consists of an ascending vertical traction mechanism (3.1) that transmits the movement to a return bracket (3.2) which transforms the vertical movement into the horizontal movement of the traction rod (5).

3. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** the lever (2) must be actuated in the opposite direction in order to lower the window or door pane (1), as a result of which the traction rod (5) also moves horizontally and the actuating cylinder (5.2) descends along a slanting surface (7.1) of the guide rail (7), which is introduced into the case (6) as a result of the weight of the pane (1), due to the fact that the roller (3) axis (8.1) slides along a slanting channel (5.2) within the case (6) until the actuating cylinder (5.2) returns to its initial position and the traction rod (5) rests upon the guide rail (7).

4. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** it has two traction rods (5), the first (5) of which is joined to the transmission mechanism (3) and the second (5) joined to the first (5) by means of a connection flange (9).

5. Upward diagonal movement guiding mechanism for liftable sliding windows and doors according to claim 1, **characterized in that** it has a guide rail (7) which supports each of the two roller (8) axes (8.1).

6. Upward diagonal movement guiding mechanism for liftable sliding windows and doors, according to claim 1, **characterized in that** each guide rail (7) supports each of the two roller (8) axes (8.1).



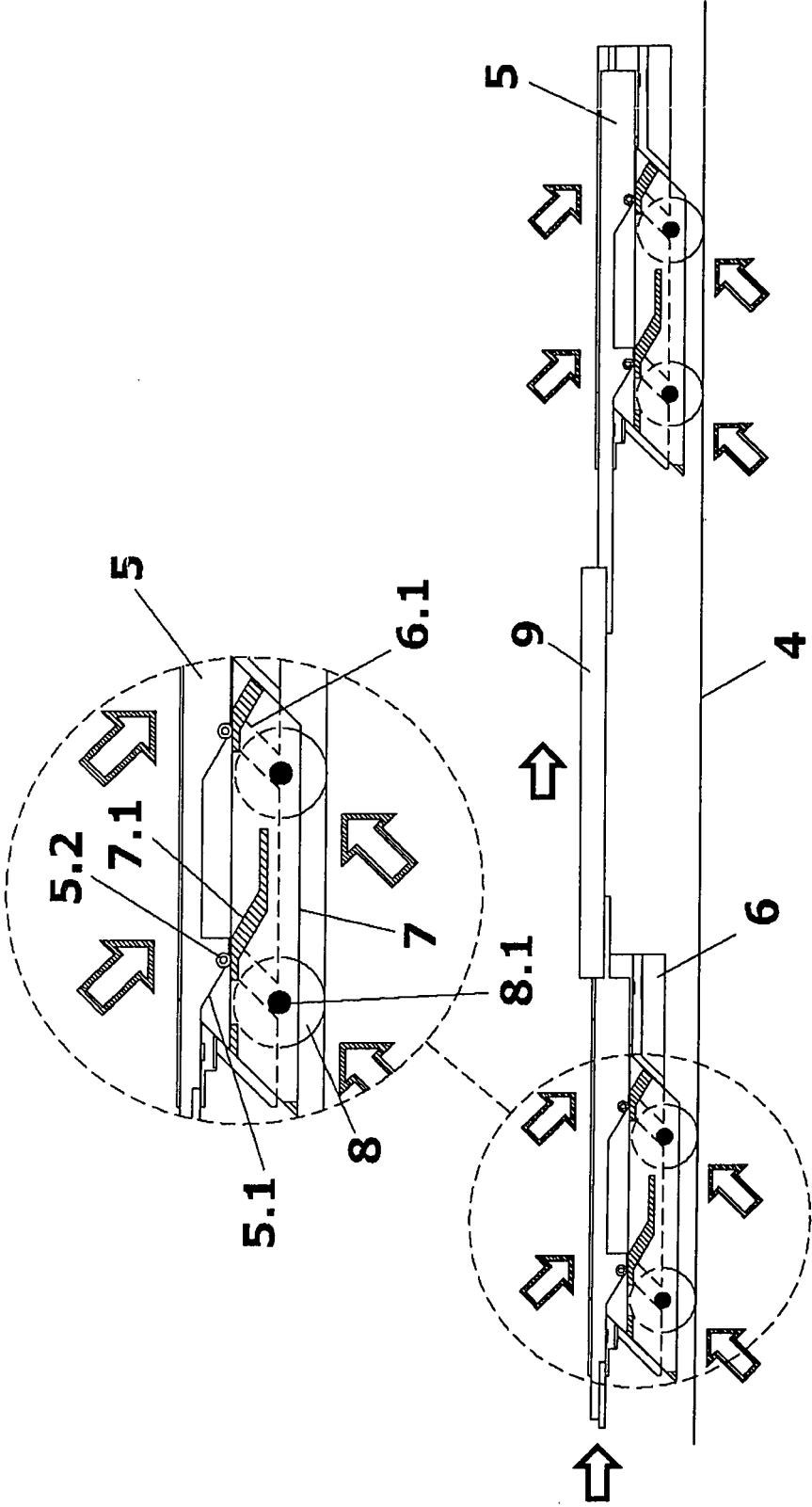


FIG.2



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 38 1052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 June 2008	Examiner Witasse-Moreau, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

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