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

Führungsmechanismus einer nach oben diagonalen Bewegung für Hebe-Schiebefenster und -türen

Mécanisme de guidage d'un mouvement diagonal vers le haut pour fenêtres et portes à soulèvement et coulissement

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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 hermiticity during the service life of the door or widow.

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

[0008] It is known from the document DE 20300080 U1, which discloses the features of the preamble of claim 1 a sliding mechanism with a runner for a pivot and side door or window pane wherein a first part (13) of the sliding mechanism (5) is fixed to the push-rod mechanism for fixing the sliding mechanism into position, while a second part (8) of the sliding mechanism supports the runner piece (6) and is guidably mounted in the wing frame (4) so that actuating the push-rod mechanism by moving the first part of the sliding mechanism will cause the second part of the sliding mechanism to be moved into the wing frame, resulting in the height of the runner piece relative to the rail (2) being altered.

[0009] It is also known from the document DE 29717409 U1 a window or door arragement, wherein a pane or panel frame is displaceable along a guide track so that it at least partly effects a covering with another fixed, but pivotable pane or panel frame. The displaceable pane or panel frame is pivotable into its position on the fixed pane or panel frame. The guide rollers (14) can be brought out of engagement with the guide track by means of an operating mechanism, when the displaceable pane or panel frame is located in the position pushed onto the fixed pane or panel frame. The guide rollers are displaceable by means of the operating mechanism (12) relatively to the under edge of the pane or panel frame (3). In the area of the guide rollers on the under side of the pane or panel frame or on a running mechanism housing on the pane or panel frame at least one static guide groove for the guide rollers is arranged.

[0010] All these drawbacks are resolved by the present invention described below.

DESCRIPTION OF THE INVENTION

[0011] 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.

[0012] 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.

[0013] Inside the case and underneath the traction rod there is a guide rail with at least one rotter, 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.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] In summary, the present invention relates to an upward diagonal movement guiding mechanism according to claim 1.

DESCRIPTION OF THE DRAWINGS

[0020] This specification is complemented by a set a 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

[0021] 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

[0022] 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).

[0023] Said return bracket transforms the vertical movement into a horizontal traction movement by means of a rod (5) that slides over a case (6).

[0024] Said case (6) contains a guide rail (7) with at least one roller (8) axis (8.1).

[0025] 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).

[0026] 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).

[0027] 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).

[0028] 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).

[0029] 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 (6.1) 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

[0030] 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).

[0031] 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).

[0032] 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 ranting traction rod (5) surface (5.1) having an actuating cylinder (5.2).

[0033] 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).

[0034] The descending movement of the pane (1) is identical to that described in the first example of preferred embodiment.

[0035] 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 with an actuating lever (2), a traction rod (5), at least one case (6) and one guide rail (7), wherein the traction rod (5) moves horizontally when actuated by the lever and a transmission mechanism (3) and the traction rod (5) slides over the case (6) installed on the lower part of a window or door pane (1) frame (1.1), wherein 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), **characterized in that**, when the traction rod (5) moves horizontallly, 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 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 the slanting channel (6.1) 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 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 of two guide rails (7) supports two roller (8) axes (81).

Patentansprüche

1. Führungsmechanismus für aufwärtige diagonale Bewegungen mit einem Antriebshebel (2), einer Zugstange (5), wenigstens einem Gehäuse (6) und einer Führungsschiene (7), wobei sich die Zugstange (5) horizontal bewegt, wenn sie durch den Hebel und einen Übertragungsmechanismus (3) angetrieben wird, und die Zugstange (5) über das am unteren Teil eines Rahmens (1.1) für Fenster- oder Türscheiben (1) installierte Gehäuse (6) gleitet, wobei die Führungsschiene (7) in jedem Gehäuse (6) und unter der Zugstange wenigstens eine Rolle (8) hat, so dass, wenn die Zugstange (5) sich horizontal bewegt, ein in der Zugstange (5) vorhandener Antriebszylinder (5.2) gegen eine geneigte Oberfläche (7.1) der Führungsschiene (7) drückt, **dadurch gekennzeichnet, dass** die fest mit der Führungsschiene (7) verbundene Rollenachse (8.1), wenn sich die Zugstange (5) horizontal bewegt, entlang eines geneigten Kanals (6.1) im Gehäuse (6) herabsinkt, wobei sie die Scheibe (1) in die Richtung des geneigten Kanals (6.1) und entgegengesetzt der Bewegung der Rolle (8) anhebt, so dass die Scheibe (1) sich aufwärts diagonal über den äußeren Rahmen für Tür- oder Fensterscheiben (4) bewegt.

2. Führungsmechanismus für aufwärtige diagonale Bewegungen für anhebbare Schiebefenster und -türen nach Anspruch 1, **dadurch gekennzeichnet, dass** der Antriebshebel (2) auf einer der Seiten der Scheibe (1) installiert ist, und der Übertragungsmechanismus (3) aus einem aufsteigenden vertikalen Zugmechanismus (3.1) besteht, der Bewegung an einen Rückstellbeschlag (3.2) überträgt, welcher die vertikale Bewegung in die horizontale Bewegung der Zugstange (5) umwandelt.

3. Führungsmechanismus für aufwärtige diagonale Bewegungen für anhebbare Schiebefenster und -türen nach Anspruch 1, **dadurch gekennzeichnet, dass** der Hebel (2) in die entgegengesetzte Richtung angetrieben werden muss, um die Fenster- oder Türscheibe (1) abzusenken, was zur Folge hat, dass die Zugstange (5) sich auch horizontal bewegt, und der Antriebszylinder (5.2) entlang der geneigten Oberfläche (7.1) der Führungsschiene (7) herabsinkt, welche als Folge des Gewichts der Scheibe (1) in das Gehäuse (6) eingeführt wird, aufgrund der

Tatsache, dass die Achse (8.1) der Rolle (8) entlang des geneigten Kanals (6.1) im Gehäuse (6) gleitet, bis der Antriebszylinder (5.2) an seine Ausgangsposition zurückkehrt und die Zugstange (5) auf der Führungsschiene (7) aufliegt.

4. Führungsmechanismus für aufwärtige diagonale Bewegungen für anhebbare Schiebefenster und -türen nach Anspruch 1, **dadurch gekennzeichnet, dass** er zwei Zugstangen (5) hat, von denen die erste (5) mit dem Übertragungsmechanismus (3) verbunden ist, und die zweite (5), verbunden mit der ersten (5), mittels eines Verbindungsflansches (9).

5. Führungsmechanismus für aufwärtige diagonale Bewegungen für anhebbare Schiebefenster und -türen nach Anspruch 1, **dadurch gekennzeichnet, dass** er eine Führungsschiene (7) hat, welche zwei Achsen (8.1) der Rollen (8) trägt.

6. Führungsmechanismus für aufwärtige diagonale Bewegungen für anhebbare Schiebefenster und -türen nach Anspruch 1, **dadurch gekennzeichnet, dass** jede von zwei Führungsschienen (7) zwei Achsen (8.1) der Rollen (8) trägt.

Revendications

1. Mécanisme de guidage en mouvement oblique ascendant ayant un levier d'actionnement (2), une tige de traction (5), au moins une boîte (6) et un rail de guidage (7) dans lequel la tige de traction (5) se déplace horizontalement quand elle est actionnée par le levier et un mécanisme de transmission (3) et la tige de traction (5) se glisse sur la boîte (6) installée sur la partie inferieure d'un cadre (1.1) du vitre (1) d'une fenêtre ou d'une porte, dans lequel à l'intérieur de chaque boîte (6) et en dessous de la tige de traction le rail de guidage (7) a au moins un rouleau (8), de façon à ce que quand la tige de traction (5) se déplace horizontalement, un cylindre d'actionnement (5.2), présent dans la tige de traction (5), pousse contre une surface oblique (7.1) du rail de guidage (7), quand la tige de traction (5) se déplace horizontalement, l'axe du rouleau (8.1), lié fermement au rail de guidage (7), descend le long d'une rainure oblique (6.1) à l'intérieur de la boîte (6), en élevant ainsi le vitre (1) dans la direction de la rainure oblique (6.1) et opposée au mouvement du rouleau (8), d'une telle manière que le vitre (1) se déplace vers le haut en oblique sur le cadre extérieur du vitre d'une porte ou d'une fenêtre (4).

2. Mécanisme de guidage en mouvement oblique ascendant pour fenêtres et portes coulissantes relevables selon la revendication 1, **caractérisé en ce que** le levier d'actionnement (2) s'installe sur un des côtes du vitre (1), et le mécanisme de transmission (3) se compose d'un mécanisme de traction vertical ascendant (3.1) transmettant le mouvement à un support de retour (3.2) qui transforme le mouvement vertical dans le mouvement horizontal de la tige de traction (5).

3. Mécanisme de guidage en mouvement oblique ascendant pour fenêtres et portes coulissantes relevables selon la revendication 1, **caractérisé en ce que** le levier (2) doit être actionné dans la direction opposée de manière à baisser le vitre de fenêtre ou de porte (1), en conséquence duquel la tige de traction (5) se déplace aussi de manière horizontal et le cylindre d'actionnement (5.2) descend le long de la surface oblique (7.1) du rail de guidage (7), qui s'introduite à l'intérieur de la boîte (6) en conséquence du poids du vitre (1), étant donné que l'axe (8.1) du rouleau (3) se glisse le long de la rainure oblique (6.1) à l'intérieur de la boîte (6) jusqu'à ce que le cylindre d'actionnement (5.2) retour à sa position initiale et la tige de traction (5) s'appui sur le rail de guidage (7).

4. Mécanisme de guidage en mouvement oblique ascendant pour fenêtres et portes coulissantes relevables selon la revendication 1, **caractérisé en ce qu'**il a deux tiges de traction (5), la première (5) desquelles est solidaire au mécanisme de transmission (3) et la seconde (5) est solidaire à la première (5) par le biais d'une bride de raccordement (9).

5. Mécanisme de guidage en mouvement oblique ascendant pour fenêtres et portes coulissantes relevables selon la revendication 1, **caractérisé en ce qu'**il a un rail de guidage (7) supportant deux axes (8.1) du rouleau (8).

6. Mécanisme de guidage en mouvement oblique ascendant pour fenêtres et portes coulissantes relevables, selon la revendication 1, **caractérisé en ce que** chacun des deux rails de guidage (7) supporte deux axes (8.1) du rouleau (8).

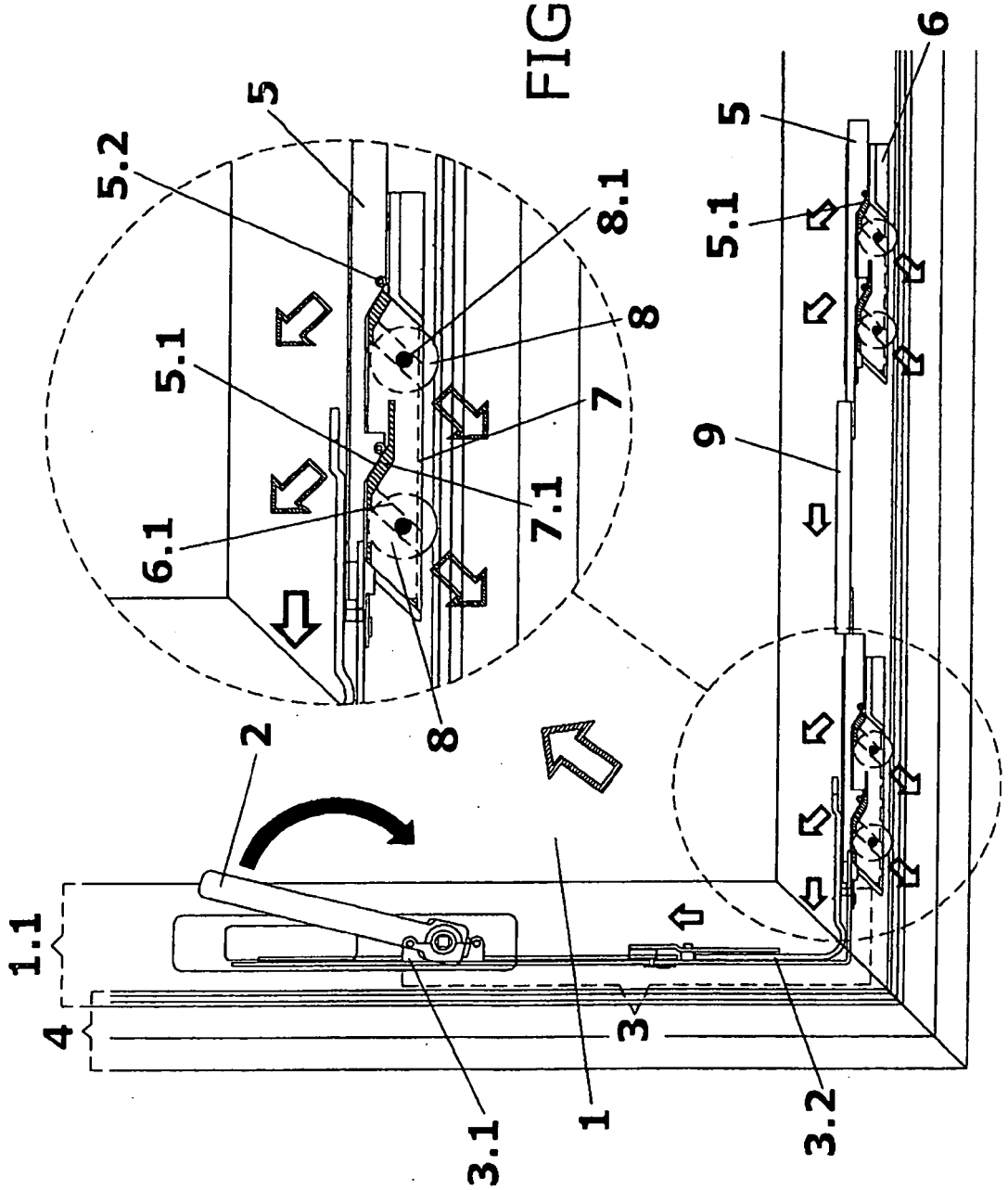


FIG.1

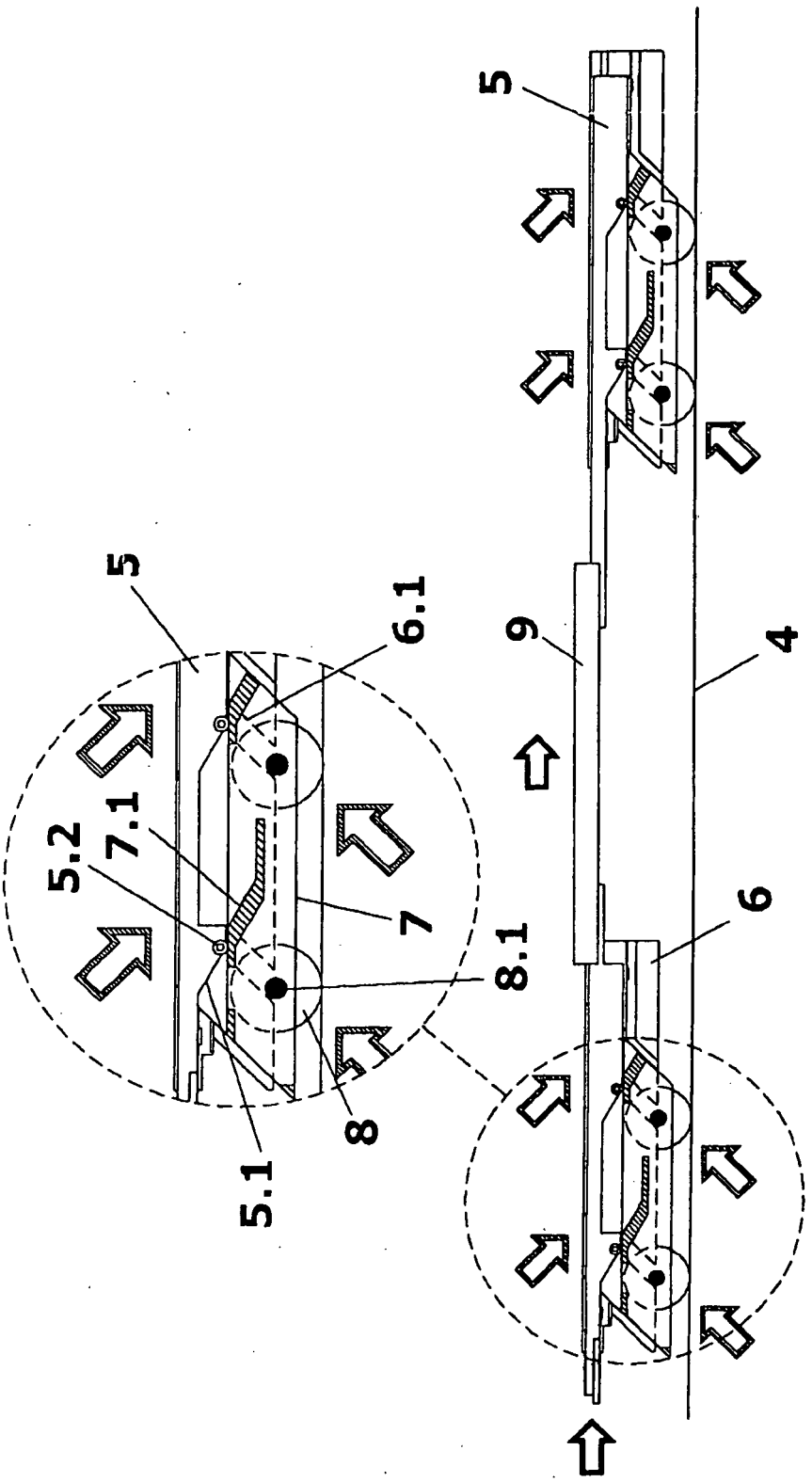


FIG.2

REFERENCES CITED IN THE DESCRIPTION

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- DE 20300080 U1 **[0008]**
- DE 29717409 U1 **[0009]**