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(54) **Balcony glazing structure**

(57) A balcony glazing structure (10) for forming a glass window or a glass wall of a balcony or other space, which balcony glazing structure includes several glazing elements (20) combining to form a glass window or a glass wall. The glazing elements are in a guide rail (31) resting on bearing-mounted wheels (24a, 24b). Pivoting members (25a, 25b) have been attached to the glazing element and a limiter (28) has been attached to its top edge and bottom edge, by which means the glazing element can be pivoted. At the pivoting point (29) of the glazing element (20) there is a support member (26, 27) for supporting the glazing element in such a way that the wheels can be detached from the guide rail and the glazing element can be pivoted to the side on the pivoting member (25a).

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Description

OBJECT OF THE INVENTION

[0001] The invention relates to a balcony glazing structure for forming a glass window or a glass wall of a balcony or other space, which balcony glazing structure includes

- several glazing elements combining to form a glass window or a glass wall,
- at least one horizontal guide rail or track.
- bearing members attached near both ends of the horizontal top edge of the glazing element, such as wheels or rollers, by means of which the glazing element is supported on the guide rail or track so that the glazing element can be moved laterally along the horizontal guide rail or track to open the glass window or the glass wall,
- pivoting members attached to the glazing element, which are located at the top edge and the bottom edge of the glazing element, most preferably near one of the vertical sides of the glazing element so that the glazing element can be pivoted around the pivoting members for opening,
- and at least one limiter attached to the glazing element, which prevents the opening of the glazing element by pivoting at any point other than the predetermined pivoting point of the guide rail or track.

PRIOR ART

[0002] Several kinds of balcony glazing structures are known, wherein the glazing elements of a glass window or glass wall of a balcony or other space are movable laterally to open the glass window or glass wall. Usually the glazing elements moved to the side can also be pivoted or otherwise moved so that the vertical glazing elements can be moved away from in front of the window as though they were stacked against each other so that they take up relatively little space.

[0003] Known solutions are presented, among others, in publications EP-0 466 731, WO-97/39215, WO-97/38200, WO-97/30258, WO-00/11298 and WO-02/14639. The problem with the solutions presented in them is, however, that it has not been possible to attach to the glazing elements such bearing members that would allow the glazing element to be moved sideways lightly and easily while at the same time ensuring reliable pivoting of the glazing element.

[0004] Some solutions, such as the one described in publication WO/90/12183, include the use of pivotable rollers or wheels, which, however, makes the bearing structure of the glazing element very complicated.

PURPOSE OF THE INVENTION

[0005] The purpose of this invention is to create a balcony glazing structure, which overcomes the above-mentioned drawbacks.

CHARACTERISTICS OF THE INVENTION

[0006] The balcony glazing structure according to the invention is characterised in that

- the balcony glazing structure has, in connection with a horizontal guide rail or track, at a predetermined pivoting point of the glazing element, a bearing support member or support surface that bears at least part of the glazing element.
- and that in the glazing element the pivoting member is a bearing part arranged to rest, at the pivoting point of the glazing element, on the support member or support surface so that the wheel or roller of the glazing element comes off or is detachable from the guide rail or track, whereby the glazing element can be pivoted on the pivoting member for opening.

EMBODIMENTS OF THE INVENTION

[0007] A preferred embodiment of the balcony glazing structure according to the invention is characterised in that the wheel or roller that bears the glazing element is mounted on ball bearings and its circumference is covered with plastic or rubber.

[0008] A second preferred embodiment of the balcony glazing structure according to the invention is characterised in that the balcony glazing structure has, at the pivoting point of the glazing element, in connection with the guide rail or track, a bearing support member furnished with a locking recess for the pivoting member.

[0009] A third preferred embodiment of the balcony glazing structure according to the invention is characterised in that the support member or support surface located in connection with the guide rail or track is of slippery plastic.

[0010] A fourth preferred embodiment of the balcony glazing structure according to the invention is characterised in that the balcony glazing structure has, at the edge of the guide rail, an opening or a notch through which the wheel or roller can be removed sideways from the guide rail when pivoting the glazing element around the pivoting members.

[0011] A fifth preferred embodiment of the balcony glazing structure according to the invention is characterised in that in the balcony glazing structure, the matching parts located at the top and bottom edge of the glazing element, such as the pivoting members and/or locking parts and/or limiters are interchangeable.

EXAMPLES OF EMBODIMENTS

[0012] In the following, the invention is described using examples with reference to the appended drawings, in which

LIST OF FIGURES

[0013]

Figure 1 is a schematic cross-sectional view of a preferred embodiment of the balcony glazing structure according to the invention.

Figure 2 is a side view of the glazing element of the balcony glazing structure in Fig. 1.

Figure 3 is a schematic side and partly cross-sectional view of a preferred embodiment of the balcony glazing structure.

Figure 4 is a schematic top view of a detail of the balcony glazing structure.

DESCRIPTION OF THE FIGURES

[0014] Fig. 1 shows a cross-sectional view of the balcony glazing structure 10 according to the invention, including a glazing element 20, a top frame structure 30 and a bottom frame structure 40. The left side of the balcony glazing structure shown in Fig. 1 faces inwards to the balcony space and the right side in Fig. 1 faces outwards.

[0015] The glazing element 20 of the balcony glazing structure 10 includes a pane 21 having a top moulding 22 attached to its top edge and a bottom moulding 23 attached to its bottom edge. The top moulding 22, bottom moulding 23, top frame 30 and bottom frame 40 are made, in a known manner, of surface-treated aluminium profile. The pane 21 can be fastened to the top moulding 22 and bottom moulding 23 using any known method, such as for example bolts, rivets or glue. The bearing members of glazing element 20 have been fastened to the top moulding 22, which bearing members in this embodiment are ball-bearing-mounted plastic-coated wheels 24 located on the side of the top moulding 22. The shafts 37 of the wheels 24 have been introduced into the hole in the top moulding 22 and locked with the nut 38. Each glazing element 20 has two bearing-mounted wheels 24, one at each end of the top moulding 22, as can be seen from Figs. 2 and 3. The wheels 24 of the glazing element 20 rest on the guide rail 31 formed in the top frame 30, the guide rail having an upward-rising edge 32 that keeps the wheels 24 in their place in the guide rail 31.

[0016] In Fig. 1 the top moulding 22 of the glazing element 20 has a fixedly and non-rotatably attached upward-facing pivoting member 25a, which is essentially the shape of a round disc but has a segment-shaped part cut off from its left side in Fig. 1. The pin 43a of the pivoting member 25a is located in the groove of the top moulding 22, where it is locked with a nut 44a at a suitable point in the top moulding 22. The shape of the pivoting member 25a is seen in Figs. 2 and 3 from the other side, too, and in Fig. 4 from the top. The pivoting member 25a rests on the locking part 26a and the bearing part 27 made preferably from plastic, which are located in the top frame 30 at the intermediate level 34, the purpose and functioning of which locking part and bearing part are described in more detail in the following figures. The shape of the pivoting member 25a and the locking part 26a is used to determine when the glazing element 20 can be pivoted to the side.

[0017] In the situation of Fig. 1, the pivoting member 25a is on top of the locking part 26a and the bearing part 27 which are located at the intermediate level 34 of the top frame 30. In this case the pivoting member 25a rests vertically on the locking part 26a and the bearing part 27 and also laterally on the locking part 26a. The top face of the bearing part 27, on which the pivoting member 25a rests, is indicated by the reference number 35a. The locking part 26a and bearing part 27 are most preferably made of plastic so that they are slippery, in which case the pivoting member 25a can be easily moved onto them.

[0018] In Fig. 1 the bottom moulding 23 of the glazing element 20 also has, attached to it, a downward-facing pivoting member 25b which corresponds to the pivoting member 25a that has been fastened fixedly and non-rotatably to the top moulding 22. The pin 43b of the pivoting member 25b is located in the groove of the bottom moulding 23, where it is locked with a nut 44b at a suitable point in the bottom moulding 23. The pivoting member 25b rests laterally on the locking part 26b located in the bottom frame 40. The functioning of these members also is described in more detail in the following figures.

[0019] The bottom frame 40 in Fig. 1 has an inclined base 41 and in its lower part a hole 42, through which any water penetrating into the bottom frame 40 can flow off. The hole 42 is located at the outer edge of the bottom frame 40, whereby any rain water that has penetrated into the bottom frame 40, for example, flows back outside the window.

[0020] Fig. 2 shows a side view of the glazing element 20 of the balcony glazing structure according to the invention. The glazing element 20 has a pane 21, top moulding 22 and bottom moulding 23. Two ball-bearing-mounted and plastic-coated wheels 24a and 24b, located essentially at both ends of the top moulding 22, have been fastened to the top moulding 22. This allows the glazing element 20 to be moved lightly and silently in its guide rail. The location of the wheels 24a and 24b at the ends of the top moulding 22 also ensures that the glazing element 20 is supported as securely as possible.

[0021] The top moulding 22 and bottom moulding 23 of the glazing element 20 in Fig. 2 have pivoting members 25a and 25b which are located at corresponding points on the side of the glazing element 20, so that the glazing element 20 can be pivoted around the vertical axis formed by them. On the opposite side of the glazing element 20 , in the top moulding 22 and in the bottom moulding 23, there are, at suitable points, limiters 28a and 28b, whose location determines the position on the guide rail where the glazing element 20 must be in order to be able to be pivoted. The limiters 28a and 28b are located in the grooves of the top moulding 22 and bottom moulding 23

and locked with nuts in a similar way as the pivoting members 25a and 25b in Fig. 1. The functioning of the limiter 28 is described in more detail in the following figure.

[0022] Fig. 3 is a schematic view of a simplified example of the balcony glazing structure 10 according to the invention and its functioning. Fig. 3 shows a glazing element 20 having, fastened to its top moulding 22, two wheels 24a and 24b which rotate in the top frame's 30 guide rail 31. Both the top frame 30 and the top moulding 22 of the glazing element 20 are shown as a partly sectional schematic view to give a better idea of the functioning of the structure.

[0023] In Fig. 3 the glazing element 20 has, attached to its top moulding 22, a pivoting member 25a and a pin-like limiter 28a. For pivoting, the glazing element 20 must first be moved to a point where the pivoting member 25a is at the locking part's 26a locking recess 29 intended specifically for this pivoting member. Hereby the glazing element 20 can be pivoted if the limiter 28a is at the opening 33 in the top frame 30. The locking recess 29 of the locking part 26a then at the same time forms the pivoting point of the glazing element 20.

[0024] Fig. 3 shows a detail that is essential for the functioning of the balcony glazing structure 10 according to the invention. When the glazing element 20, supported on the wheels 24a and 24b, moves in the guide rail 31, the pivoting member 25a attached to the glazing element 20 moves with it inside the top frame 30. In this case, the pivoting member 25a moves above the intermediate level 34 of the top frame 30, but does not touch the intermediate level 34, making the movement of the wheels 24a and 24b of the glazing element 20 as light as possible.

[0025] In the situation shown in Fig. 3, the glazing element 20 has, however, been moved so far to the left in Fig. 3 that the pivoting member 25a has moved on top of the locking part 26a and bearing part 27 located at the end of the top frame 30, which thus support the pivoting member 25a, as shown in Fig. 1. The bearing part 27 is not shown in the partly sectional view of Fig. 3. The reference number 35, however, schematically indicates a bearing surface that bears the pivoting member 25a and at the same time the glazing element 20. Fig. 3 shows that when the glazing element 20 is at this point, there are openings 36a and 36b at the edge 32 of the guide rail 31, at points corresponding to the location of the wheels 24a and 24b. When also the limiter 28 fastened to the top moulding 30 of the glazing element 20 is at the opening 33 in the top frame 30, then the glazing element 20 can be removed from the guide rail 31 and pivoted on the pivoting member 25a.

[0026] The locking part 26a and the bearing part 27, which are made of plastic, can be designed so that when the pivoting member 25a reaches these parts, these parts bear the pivoting member 25a, at least partly. When the glazing element 20 has moved to the point shown in Fig. 3, the support surface 35 of the locking part 26a and the bearing part 27 must bear at least so much of the load that the glazing element 20 no longer rests on the wheel 24a, because in this case the opening 36a at the edge 32 of the guide rail 31 allows the wheel 24a to move sideways. Fig. 1 also shows that the cross-sectional shape of the guide rail 31 allows for the lateral movement of the wheel 24a when the edge 32 of the guide rail 31 has been removed at the opening 36a.

[0027] Fig. 4 shows a schematic top view of the locking part 26a and the pivoting member 25a resting on it, and represents schematically the pivoting of the glazing element 20 in the situation of Fig. 3. In this case, the lower surface of the pivoting member 25a fastened to the top moulding 30 of the glazing element 20 is resting on the support surface 35b of the locking part 26a. The pivoting member 25a also rests on the support surface 35a of the bearing part 27 shown in Fig. 1, but this is not shown in Fig. 4.

[0028] When the glazing element 20 in Fig. 4 is pivoted, the cylindrical outer surface of the pivoting member 25a enters the locking recess 29 of the locking part 26a. In this case, the pivoting member 25a, which acts as the pivoting axis of the glazing element 20, stays well in place. The locking recess 29 of the locking part 26a thus becomes the pivoting point of the glazing element 20 and the pivoting movement of the glazing element 20 is controlled. Fig. 4 shows that the glazing element 20 has pivoted by an angle α. Usually, in a balcony glazing structure the glazing element 20 is pivoted so that the angle α is about 90°, in which case the opened glazing elements 20 are on top of each other against the side wall of the balcony. If required, the angle α can, however, be any other angle.

[0029] In the example of embodiment shown in Figs. 1-4, both the top and bottom edge of the glazing element 20 have matching parts, such as the pivoting members 25a and 25b, the locking parts 26a and 26b and the limiters 28a and 28b. These may be different at the top and bottom edges of the glazing element 20, but according to a preferred embodiment they are similar at both edges. This brings major savings in manufacturing and maintenance costs.

ADDITIONAL NOTES

[0030] It is obvious to a person skilled in the art that the different embodiments of the invention may vary within the scope of the claims presented below. Further, it is also clear that the balcony glazing structure presented can also be used, for example, in an openable balcony glass wall or any other openable wall.

LIST OF REFERENCE NUMBERS

[0031]

10 Balcony glazing structure
20 Glazing element
21 Pane
22 Top moulding

23 Bottom moulding
24 Wheel
25 Pivoting member
26 Locking part
27 Bearing part
28 Limiter
29 Pivoting point of the glazing element, locking recess
30 Top frame structure
31 Guide rail
32 Guide rail edge
33 Opening
34 Intermediate level
35 Support level
36 Notch
37 Shaft
38 Nut
40 Bottom frame structure
41 Inclined base
42 Hole
43 Pivoting member pin
44 Nut

Claims

1. A balcony glazing structure (10) for forming a glass window or a glass wall of a balcony or other space, which balcony glazing structure includes

- several glazing elements (20) combining to form a glass window or a glass wall,
- at least one horizontal guide rail (31) or track,
- bearing members (24a, 24b) attached near both ends of the horizontal top edge of the glazing element (20), such as wheels or rollers, by means of which the glazing element is supported on the guide rail (31) or track so that the glazing element can be moved laterally along the horizontal guide rail or track to open the glass window or the glass wall,
- pivoting members (25a, 25b) attached to the glazing element (20), which are located at the top edge and bottom edge of the glazing element, most preferably near one of the vertical sides of the glazing element so that the glazing element can be pivoted around the pivoting members for opening.
- and at least one limiter (28) attached to the glazing element (20), which prevents the opening of the glazing element by pivoting at any point other than the predetermined pivoting point (29) of the guide rail (31) or track,

characterised in that

- the balcony glazing structure (10) has, in connection with a horizontal guide rail (31) or track, at a predetermined pivoting point (29) of the glazing element (20), a bearing support member (26, 27) or support surface (35) that bears at least part of the glazing element,
- and that in the glazing element (20) the pivoting member (25a) is a bearing part arranged to rest, at the pivoting point (29) of the glazing element, on the support member (26, 27) or support surface (35) so that the wheel (24a) or roller of the glazing element comes off or is detachable from the guide rail (31) or track, whereby the glazing element can be pivoted on the pivoting member for opening.

2. A balcony glazing structure (10) according to claim 1, **characterised in that** the balcony glazing structure (10) has, at the pivoting point (29) of the glazing element (20), in connection with the guide rail (31) or track, a bearing support member (26a) which has a locking recess for the pivoting member (25a).

3. A balcony glazing structure (10) according to claim 1 or 2, **characterised in that** the balcony glazing structure (10) has, at the edge (32) of the guide rail (31), an opening or a notch (36) through which the wheel (24a, 24b) or roller can be removed sideways from the guide rail (31) when pivoting the glazing element (20) around the pivoting members (25a, 25b).

4. A balcony glazing structure (10) according to claim 1, 2, or 3, **characterised in that** in the balcony glazing structure (10), the matching parts located at the top and bottom edge of the glazing element (20), such as the pivoting members (25a, 25b) and/or locking parts (26a, 26b) and/or limiters (28a, 29b) are interchangeable.

5. A balcony glazing structure (10) according to any one of claims 1-4, **characterised in that** the support member (26, 27) or support surface (35) located in connection with the guide rail (31) or track is of slippery plastic.

6. A balcony glazing structure (10) according to any one of claims 1-5, **characterised in that** the wheel (24a, 24b) or roller that bears the glazing element (20) is mounted on ball bearings and its circumference is covered with plastic or rubber.

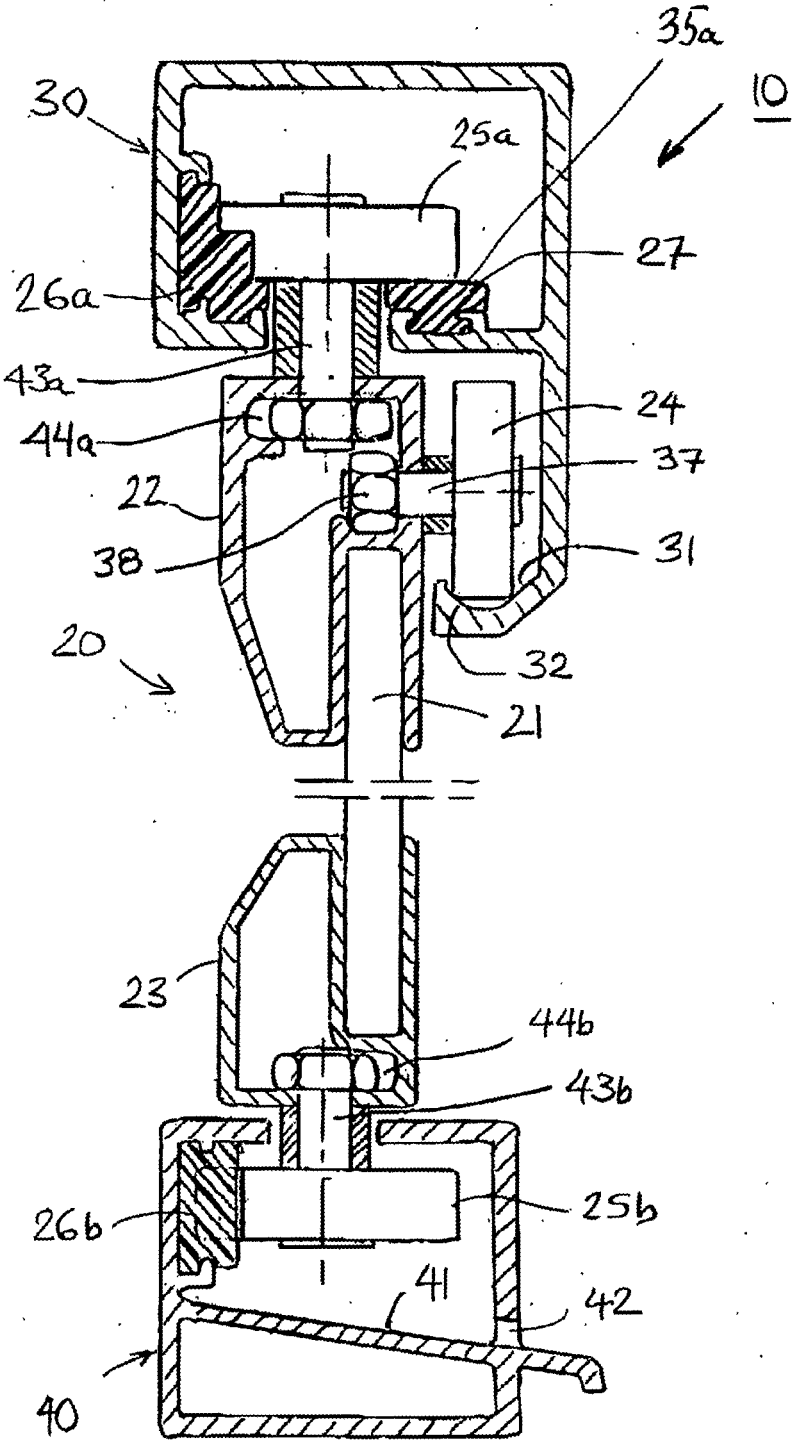
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FIG. 1

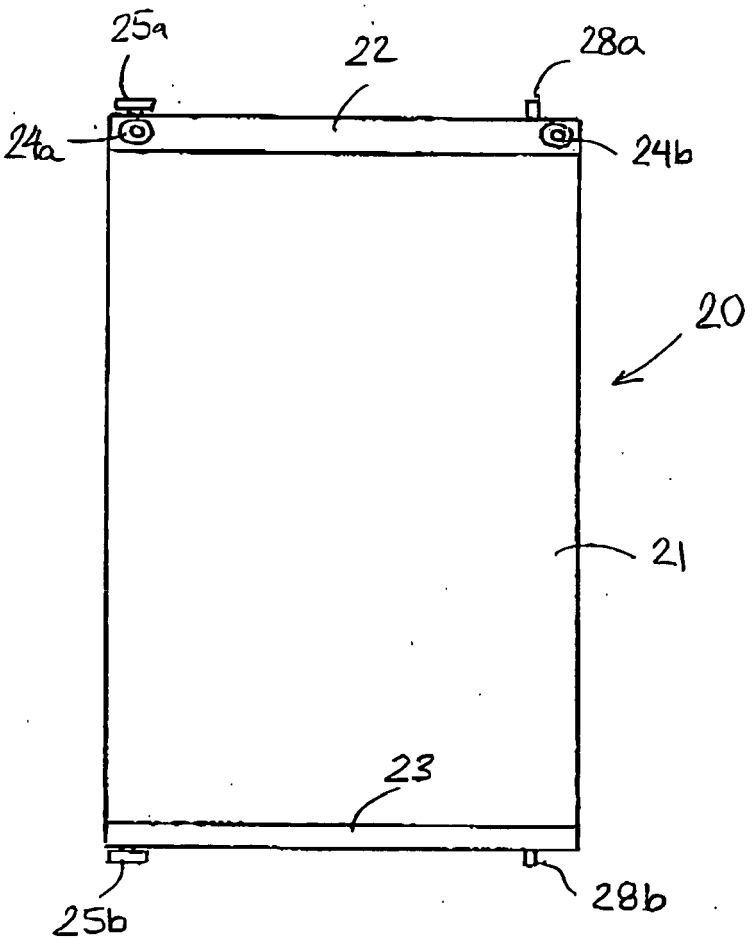

FIG. 2

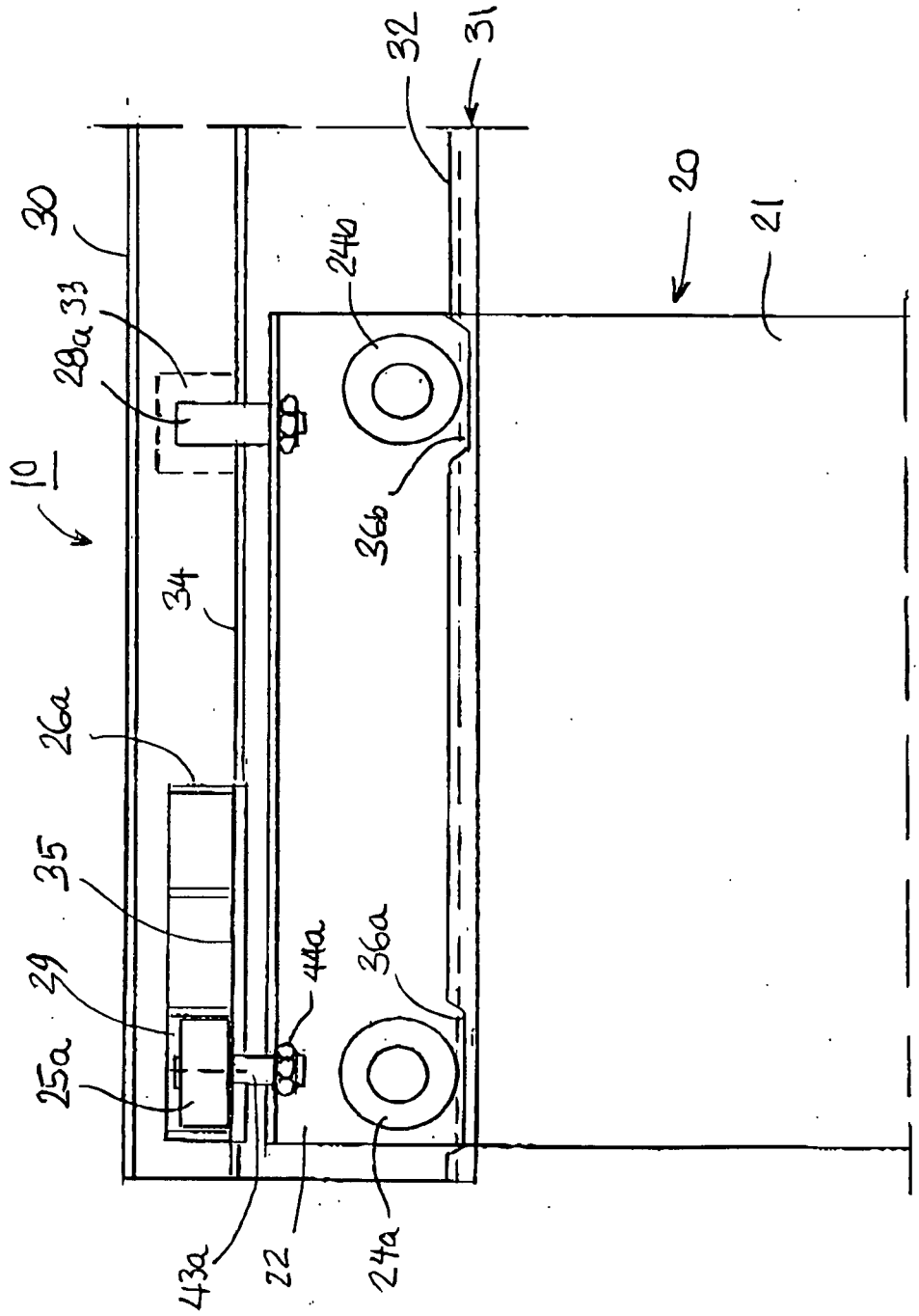

FIG. 3

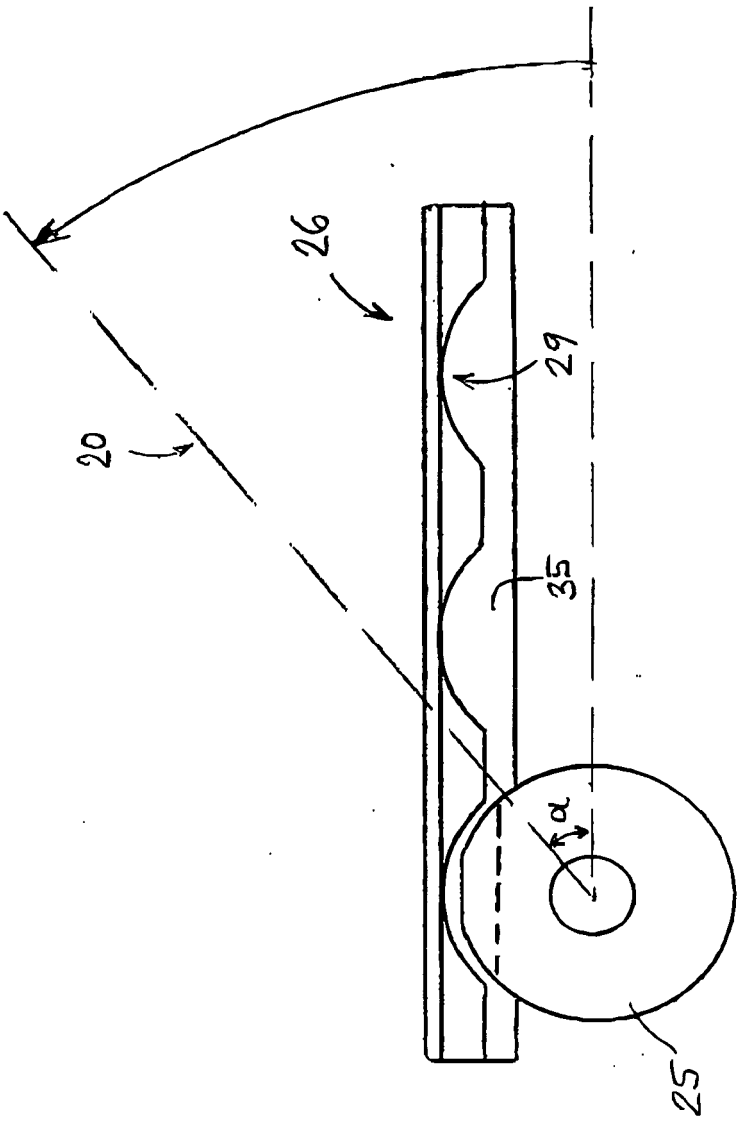

FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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