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(54) **Glass element**

(57) A glazing element (31, 32), intended for balcony or terrace glazing or as an indoor space divider, which glazing element is suspended on a guideway (21, 22) of a rail (10) located above the glazing element. The wheel (33, 34) or roller of the glazing element is affixed in a hole created in the glass pane by means of a screw (37) that forms an axle and by means of a threaded counterpiece (36). In conjunction with the screw (37), there is a rotatable eccentric bush (35) for adjusting the position of the wheel or roller.

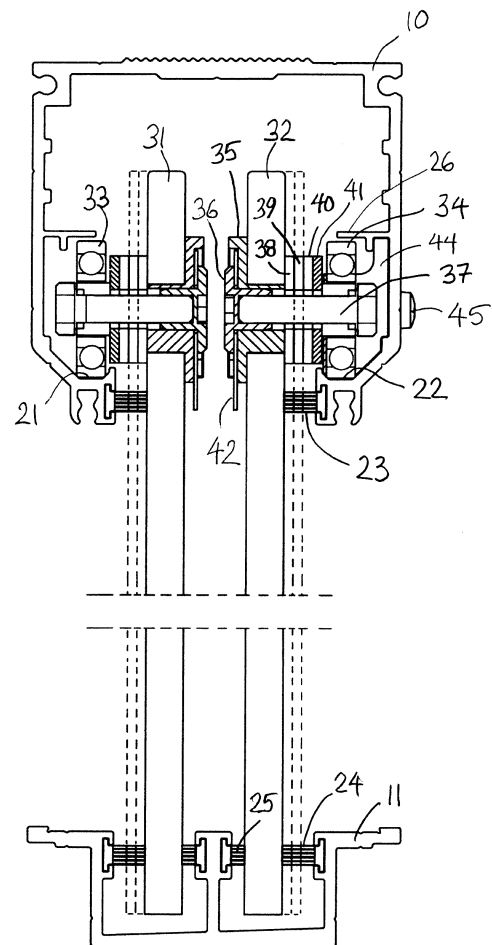


FIG. 1

Description

[0001] The object of the present invention is a glazing element according to the introduction of claim 1. The glazing element is intended for balcony or terrace glazing or as an indoor space divider, and the glazing element is suspended by means of wheels or rollers and carried by the guideway of a rail located above the glazing element such that the element can be moved horizontally along the rail. There may be several glazing elements, and at least one glazing element can be moved in the direction of the rail such that the window, wall or other opening created by the glazing elements can at least partially be opened and closed. Thus the retractable glazing element is most preferably equipped with wheels or rollers which can roll on top of the rail.

[0002] According to a known solution, the wheels or rollers are fastened to a glazing bar affixed to the top edge of the glazing element. It is also known that a glazing element has, instead of a separate top glazing bar, a separate suspension member attached to the top edge of the glazing, wherein the wheel or roller supported by a rail is located in the suspension member above the glazing element.

[0003] The purpose of the invention at hand is to create a novel glazing element which is simpler and more easily adjustable than known glazing elements. The invention is characterized in what has been presented in the characteristics section of claim 1. The structure of a glazing element according to the invention, however, is made simpler by affixing the wheel or roller directly to the glazing such that no suspension members above the glazing element are necessary. Here, holes are made in the top edge of the glazing element, wherein shafts are placed for two or more wheels or rollers from which the glazing element is suspended from the rail. In this case the glazing element can be moved in the direction of the rail, but it can also be locked in place as necessary.

[0004] In a structure according to the invention the axle of a wheel or roller is located directly in a hole arranged in the glazing element without the need for separate suspension members above the glazing. However, most preferably there is a spacer, for example a plastic bush, between the axle and the glazing because it is not preferable in terms of the durability of the structure to have a metallic axle in direct contact with the glazing element. The spacer, such as a plastic bush, may have an eccentricity to make it possible to accurately adjust the axle in order to slightly change the position of the axle. This is advantageous, for example, if the ability to adjust the height of the wheel or roller relative to the rail is desirable. Alternatively, the eccentricity and adjustability can be accomplished by making an elongated or oval hole in the glass and by making the fastening member of the bearing movable in the hole. In order to make the structure sturdier, a suitable filler piece can be placed in the hole, or the fastening member of the bearing is tightened without any filler piece to fit closely to a suitable location in the

glass.

[0005] In addition to simplicity, the benefit of a structure according to the invention is that the top edge of the glazing element and the wheels or rollers attached to it rise above the guideway on the profile rail and remain hidden inside the profile rail. This way the structure suspending the glazing element becomes shallow and slender and does not take up any space in the access opening when opened. This also makes the visual appearance most advantageous because no suspension members remain visible. Furthermore, the glazing element is easy to seal up by means of a gasket installed between the edge of the rail and the glazing element.

[0006] The simple structure also makes it unnecessary to install the wheels or rollers of the glazing element at the factory. A frameless balcony or terrace glazing structure according to the invention is very easy to assemble on site. The wheels or rollers only need to be affixed to the glazing element, after which it is immediately ready for installation.

[0007] In the following, the invention is described by an example with reference to the accompanying drawings, in which

LIST OF FIGURES

[0008]

- | | |
|-------------------------|---|
| Fig. 1 | shows a cross section of the glazing element structure. |
| Fig. 2 | shows a detail of the cross section of the glazing element structure. |
| Figures 3A and 3B | show an eccentric bush for affixing a wheel. |
| Fig. 4 | shows a schematic view of the adjustment of the eccentric bush. |
| Fig. 5 | shows a blocker for limiting the movements of the glazing element. |
| Fig. 6 | shows an alternative solution for the glazing element structure. |
| Fig. 7 | shows alternatives for the holes of the glazing element. |
| Figures 8A and 8B | show alternative members for affixing a wheel. |
| Fig. 9 | shows an alternative fixing member. |
| Figures 10A through 10D | show alternative solutions for arranging the glazing elements. |

DESCRIPTION OF THE FIGURES

[0009] Fig. 1 shows a glazing element structure according to the invention wherein two guideways 21 and 22 are created in a rail 10 for suspending glazing elements. The rail is most advantageously made from a metal profile, such as an aluminium profile. At least one glazing element 31 and 32 is located on each guideway 21 and 22, and the glazing element is equipped with wheels 33 and 34 including bearings. Fig. 1 shows the cross-

sections of two glazing elements 31 and 32, but both guideways 21 and 22 of the rail 10 can also have several glazing elements. Each glazing element 31 and 32 may also be equipped with two or more wheels 33 and 34. A heavy glazing element advantageously has four wheels, for example.

[0010] The wheels 33 and 34 in Fig. 1 are most preferably bearings with, most preferably, plastic coating on their outside perimeter. The wheel 33 is affixed to the glazing element 31, and the wheel 34 is correspondingly affixed to the glazing element 32 such that eccentric bushes 35 and counterpieces 36, most preferably made of plastic, are first placed in holes arranged in the glazing elements. The counterpiece 36 is made of metal, such as brass, and equipped with an internal thread into which the screw 37 forming the axle of wheel 33 or 34 can be turned. The wheels 33 and 34 are locked in place by means of the screws 37 forming their axles such that the screws 37 are turned into the threads of the counterpieces 36.

[0011] Before locking the screw 37 in the counterpiece 36, the eccentric bush 35 can still be turned in the hole of the glazing element 31 or 32. Thus the position of the counterpiece 36 and the screw 37 in the hole of the glazing element 31 or 32 changes whereby also the position of the wheel 33 or 34 relative to the glazing element 31 or 32 changes. This way one can fine-tune the positions of the wheels 33 and 34 relative to the glazing element 31 or 32 as required. It is preferred that the positions of the wheels 33 and 34 can be adjusted at least in the vertical direction of the glazing element because this way the position of the wheel determines the position and height of the glazing element relative to the rail 10. Indeed it is essential in a solution according to the invention that the height adjustment and position adjustment of the glazing element can be accomplished by means of members in conjunction with the glazing element instead of adjustments in conjunction with the fixtures of the installation rail, as in known solutions.

[0012] Fig. 1 additionally shows that the example presented here has four washers 38, 39, 40 and 41 between the wheel 34 and the glazing element 32. The washer 41 positioned against the wheel 34 is made of metal, such as stainless steel for example. The washer 38 positioned against the glazing element 32 and the washers 39 and 40 are made of plastic. Washers 38 and 39 are spacing washers to be used such that, when the thickness of the glazing element 32 is more than 8 mm, as in the example shown in Fig. 1, both washers 38 and 39 are in place. When the thickness of the glazing element 32 exceeds 10 mm washer 38 is left out and only washers 39, 40 and 41 are in place. When the thickness of the glazing element 32 is 12 mm both washers 38 and 39 are left out and only washers 40 and 41 are in place. This type of solution keeps the spacing between the glazing elements

always constant regardless of the thickness of the glass.

[0013] As Fig. 1 shows, the spacing washers 38 and 39 are positioned on the opposite sides in conjunction of

both glazing elements 31 and 32 such that, regardless of the thickness of the glazing elements 31 and 32 and the number of required spacing washers, the distance between the glazing elements 31 and 32 always remains the same. Because the distance between the guideways 21 and 22 in rail 10 remains the same only the distance of the wheel 33 from the glazing element 31 and the distance of the wheel 34 from the glazing element 32 changes as the thickness of the glazing elements 31 and 32 changes.

[0014] In Fig. 1, sealing up of the glazing elements 31 and 32 has been accomplished by keeping an intermediate gasket 25 in the bottom profile 11, between the glazing elements 31 and 32, the same regardless of the thickness of the glazing elements 31 and 32. Only the top gasket 23 and bottom gasket 24 of each glazing element 31 and 32 change as the thicknesses of the glazing elements 31 and 32 change. The bottom profile 11 may be installed flush with the floor or upon the floor surface.

[0015] Fig. 2 shows a detail of Fig. 1. Fig. 2 specifically shows in greater detail the method of affixing the wheel 34 with a bearing joined with the glazing element 32, as already described in connection with Fig. 1.

[0016] Figures 3A and 3B show the eccentric bush 35 used for affixing the wheel 33 or 34 and positioned in the hole created in the glazing element 31 or 32. In this alternative, the hole of the glazing element 31 or 32 is most preferably a circular hole wherein the protruding part 49 of the eccentric bush 35 fits. In the protruding part 49, there is a hole 50 for an axle pin. As Fig. 3B shows, the axle pin hole 50 is positioned eccentrically in the protruding part 49. When the eccentric bush 35 is rotated in the hole created in the glazing element the position of the axle pin positioned in the hole 50 of the protruding part 49 of the eccentric bush 35 and simultaneously the position of the wheel changes relative to the glazing element. By adjusting the position of the wheel joined with the glazing element, one can simultaneously adjust the distance of the glazing element from the rail suspending the wheel. According to the invention, one can in this way easily adjust the position of the glazing element by means of the adjusting members in conjunction with the glazing element.

[0017] Fig. 4 shows how the eccentric bush of the glazing element, positioned most preferably in a round hole, is adjusted. An adjustment lever 42, made most preferably of metal, is positioned in conjunction with the eccentric bush 35 such that, by turning the adjustment lever 42, one can rotate the eccentric bush 35. The position of the hole 50 in the protrusion 49 of the eccentric bush 35 relative to the glazing element is simultaneously also changed. In other words, one can change the position of the axle pin of a wheel positioned in the hole 50 of the eccentric bush 35 relative to the glazing element. When all the wheels of the glazing element have similar adjustment members, the height and position of the glazing element can easily be adjusted.

[0018] Fig. 5 shows a blocker 44 positioned in conjunc-

tion with the rail 10 for blocking the movement of the glazing element along the rail 10. The blocker 44 is most preferably positioned at a suitable location in the rail profile and affixed to the profile by means of a screw 45 installed through a hole 46.

[0019] Fig. 6 shows an alternative solution for adjusting the glazing element 32. The axle 37 of the wheel 34 is positioned in a bush positioned in a hole of the glazing element 32, as presented in the solution above. In this solution, however, the bush 47 does not form any eccentricity. The possibility for adjustment is accomplished by creating a hole in a shape other than circular in the glazing element. It is most preferably elongated or oval such that the bush 47 can move in the hole. When the glazing element is adjusted to the correct position and the bush 47 is at a suitable location in the hole, the bush 47 is tightened in place. To ensure that the bush stays locked, a suitable filler piece can be placed in the empty space in the glazing element.

[0020] Fig. 7 shows alternative shapes of holes 48 in the glazing element 32. Figures 8A and 8B show symmetrical bushes that are used when an adjustment hole deviating from a circular shape is made in the glazing element. Fig. 9 shows a schematic top view of the bush 47 and the counterpiece 36.

[0021] Figures 10A through 10D show alternative solutions for arranging the glazing elements 32. The example shown here has six glazing elements which can be arranged in various ways as follows: Fig. 10A has two fixed glass panes at both sides, and the two innermost glass panes are movable and can be opened. Fig. 10B has two fixed glass panes on the left, one fixed glass pane on the right and three movable glass panes that can be opened in the middle. Fig. 10C has three fixed glass panes on the left and three movable glass panes that can be opened on the right. Fig. 10D has one fixed glass pane on the left and two fixed glass panes in the middle. Three glass panes are movable and can be opened. It is also possible that each one of the glass panes can also be locked or opened. In this way the function of each glazing element can be changed and any of the glass panes can optionally be arranged to be opened. It is also possible that all of the glass panes can be opened. Locking can be accomplished, for example, by means of a screw 45 turned in through the profile.

[0022] In a solution according to the invention, the washers accompanying the fastening members are specified in accordance with the thickness of the glazing element. If the glass pane is thinner, the number of washers is increased. This way the spacing between two glass panes always stays the same. A flange 26 in the profile rail prevents the wheel from raising upwards and coming out of the guideway 22. The flange can be worked off or it can be bended up to create an installation point where wheels can be set onto the rail or taken off of it.

[0023] Above, a solution according to the invention is arranged in conjunction with the glazing elements. However, it can also be applicable in conjunction with any

other plate or plate element.

LIST OF REFERENCE NUMBERS

5	[0024]	
10	Rail	
11	Bottom profile	
21	Guideway	
10	22	Guideway
23	Top gasket	
24	Bottom gasket	
25	Intermediate gasket	
26	Flange	
15	31	Glazing element
32	Glazing element	
33	Wheel	
34	Wheel	
35	Eccentric bush	
20	36	Counterpiece
37	Screw	
38	Washer	
39	Washer	
40	Washer	
25	41	Washer
42	Adjustment lever	
43	Adjustment tool	
44	Blocker	
45	Screw	
30	46	Hole
47	Bush	
48	Hole	
49	Protruding part	
50	Hole	

Claims

1. A glazing element (31, 32), intended for balcony or terrace glazing or as an indoor space divider, which glazing element is suspended by means of wheels (33, 34) or rollers and carried by the guideway (21, 22) of a rail (10) located above the glazing element, such that the element can be moved horizontally along the rail, **characterised in that** the wheel (33, 34) or roller of the glazing element (31, 32) is affixed directly to the glass pane without any suspension members above the glazing element.
2. A glazing element (31, 32) according to claim 1, **characterised in that** the wheel (33, 34) or roller of the glazing element (31, 32) is affixed in a hole created in the glass pane by means of a screw (37) that forms an axle, a bush (35, 47) and a threaded counterpiece (36).
3. A glazing element (31, 32) according to claim 1 or 2, **characterised in that**

- there is a bush (35) located in the hole (48) of the glazing element in conjunction with the screw (37) that forms the axle of the wheel (33, 34) or roller of the glazing element (31,32),
- the bush (35) is an eccentric bush that can be turned in the hole (48) of the glazing element to adjust the position of the wheel (33, 34) or roller relative to the glazing element (31, 32).

4. A glazing element (31, 32) according to claim 1 or 2, **characterised in that**

- there is a bush (35) located in the hole (48) of the glazing element in conjunction with the screw (37) that forms the axle of the wheel (33, 34) or roller of the glazing element (31,32),
- the hole (48) of the glazing element deviates from a circular shape and is elongated or oval, for example, such that the bush (35) can be moved inside the hole in the glazing element and can be locked in a selected position.

5. A glazing element (31, 32) according to any one of claims 1 through 4, **characterised in that**

- two or more glazing elements (31, 32) are positioned on two adjacent guideways (21, 22), and
- one or more washers (38, 39) can be positioned in conjunction with the screws (37) forming the axles of the wheels (33, 34) or rollers of the glazing elements (31, 32) such that the distance between glazing elements (31, 32) located on adjacent guideways remains the same regardless of the thickness of the glazing elements.

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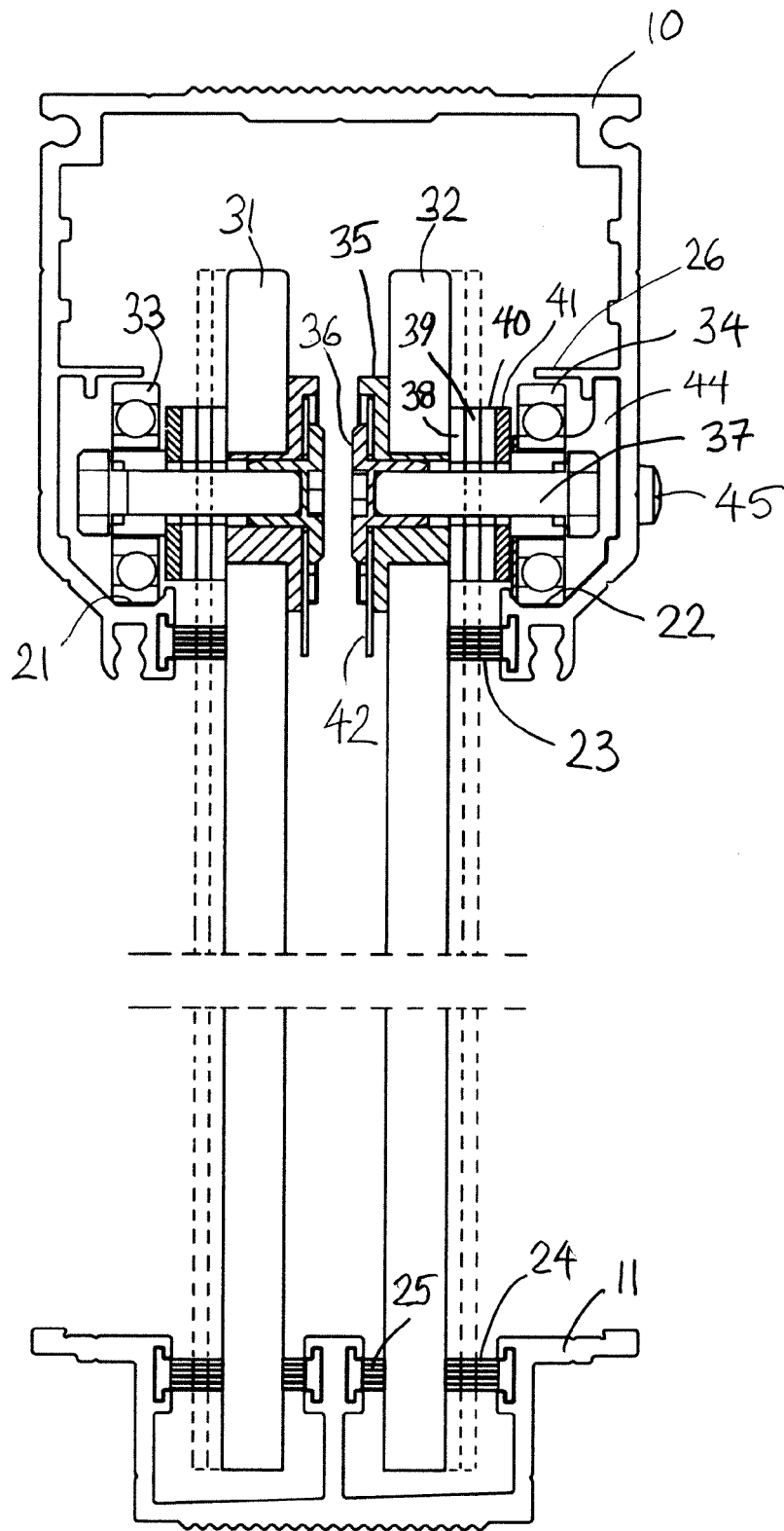


FIG. 1

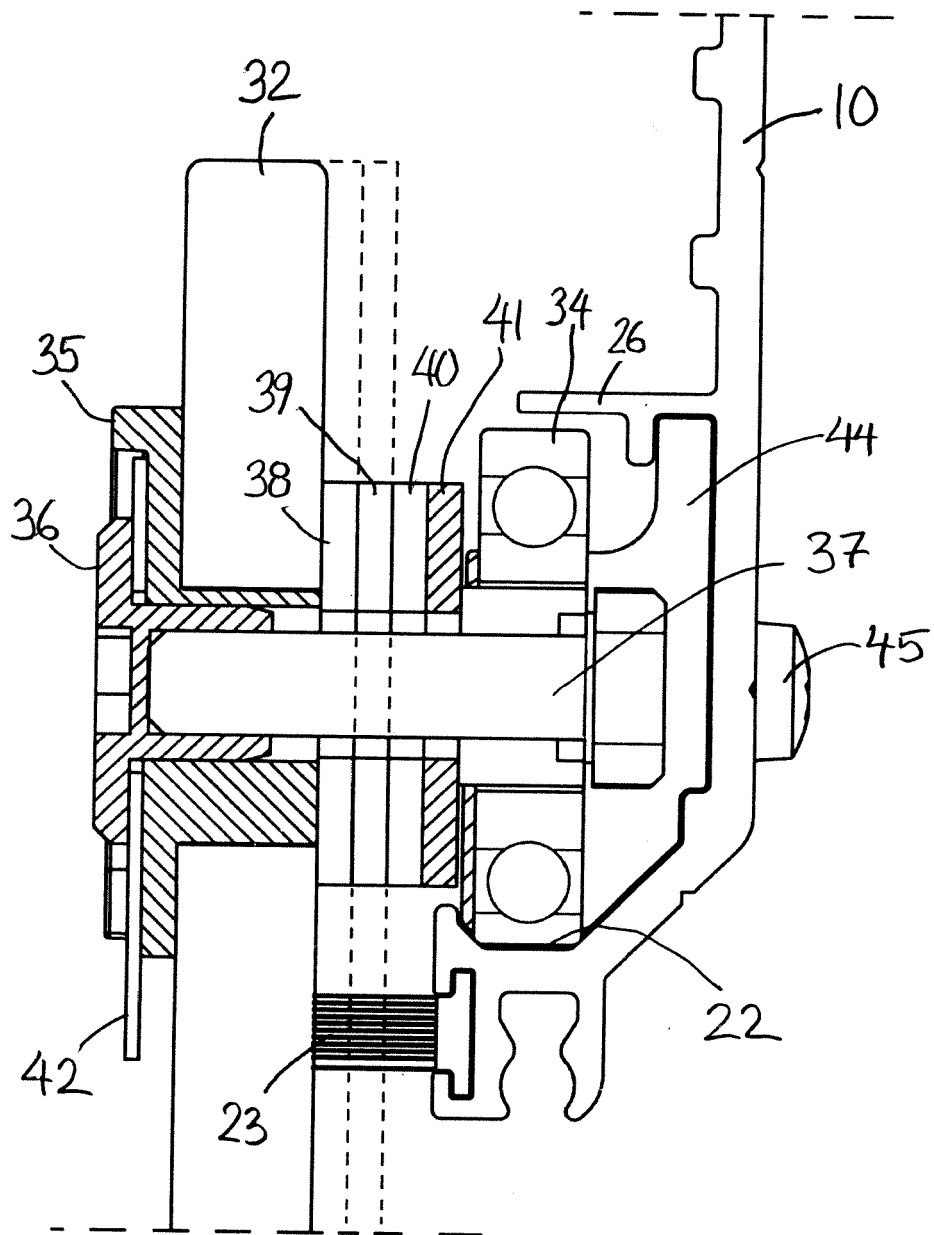


FIG. 2

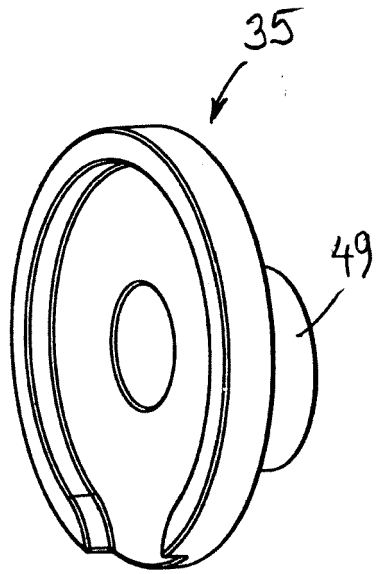


FIG. 3A

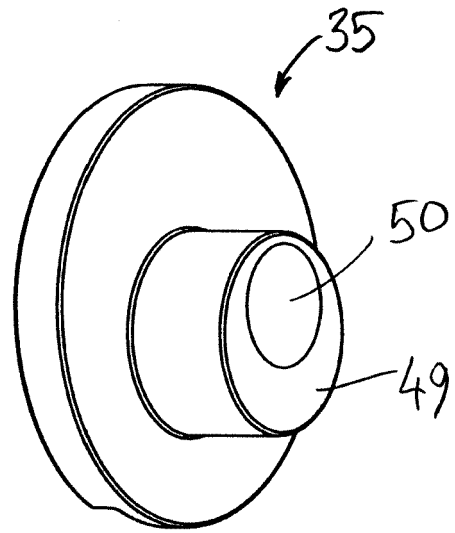


FIG. 3B

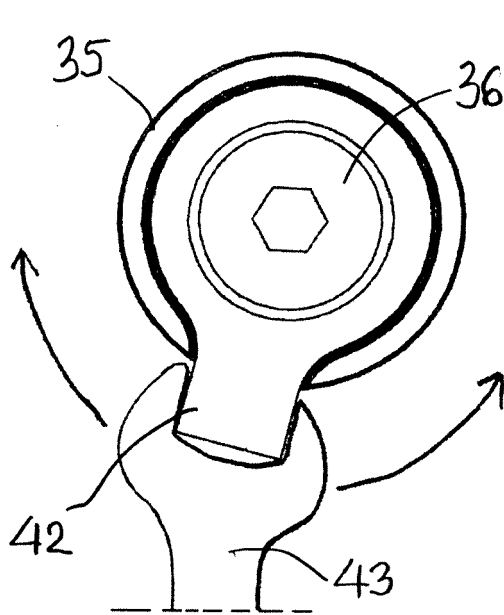


FIG. 4

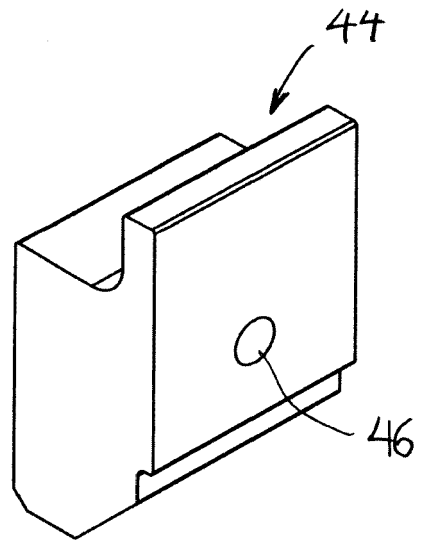


FIG. 5

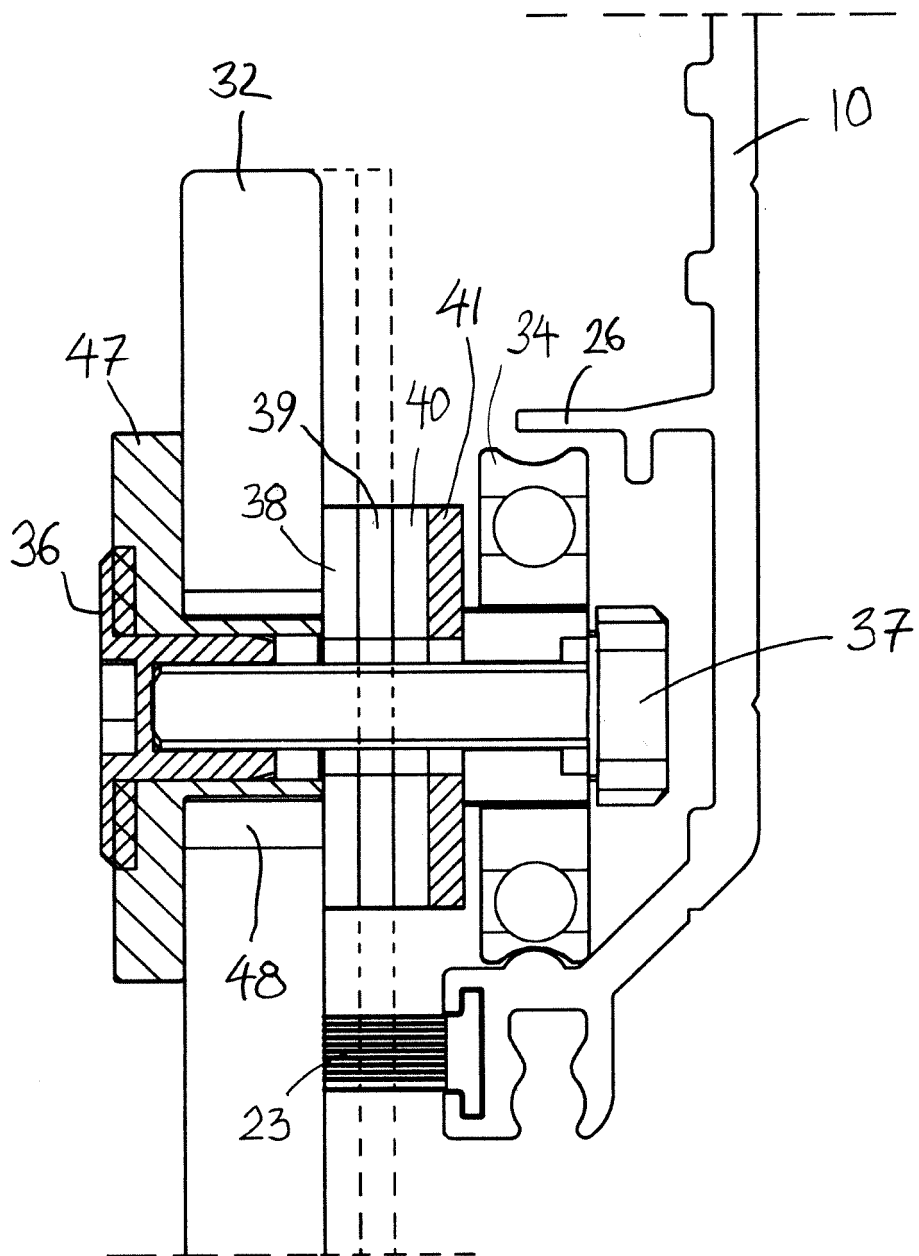


FIG. 6

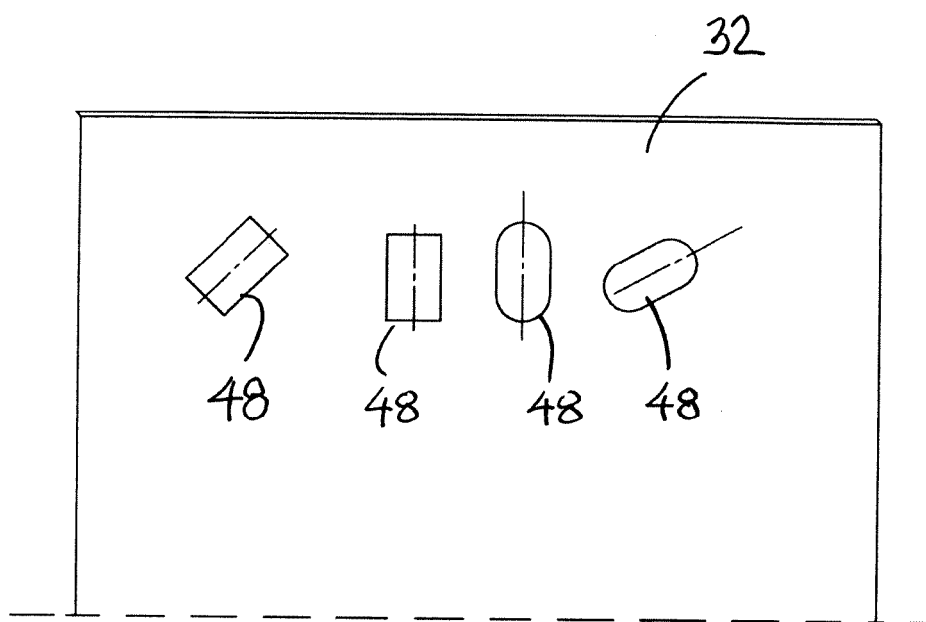


FIG. 7

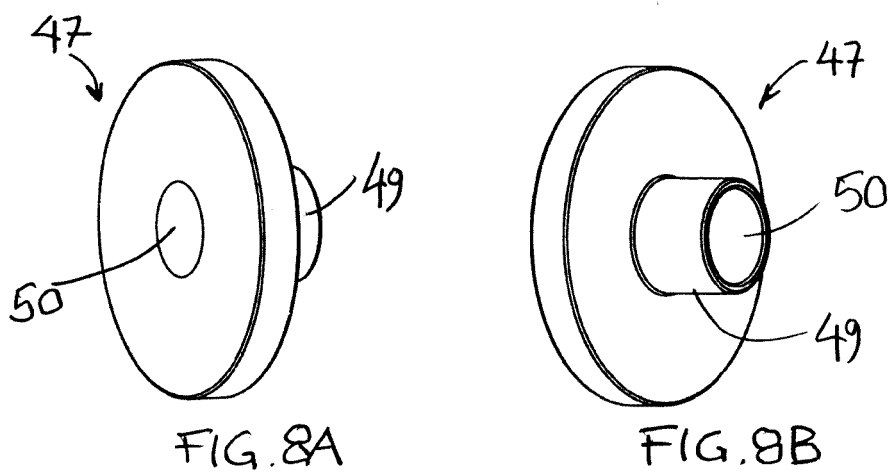


FIG. 8A

FIG. 8B

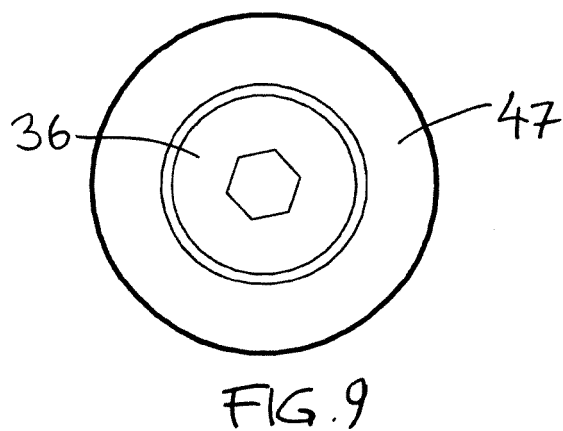


FIG. 9

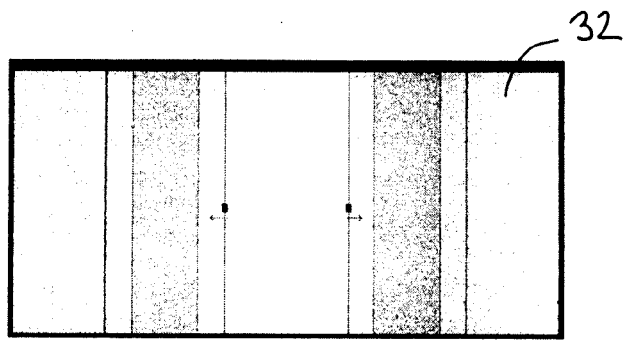


FIG. 10A

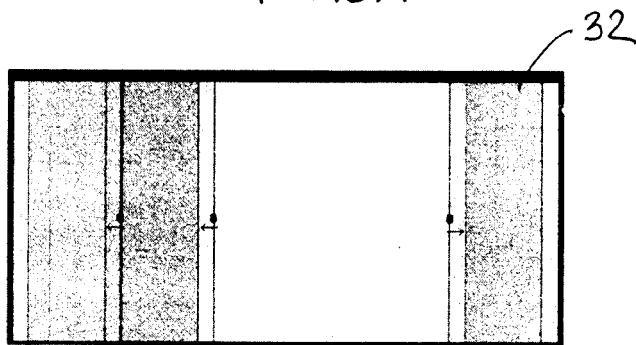


FIG. 10B

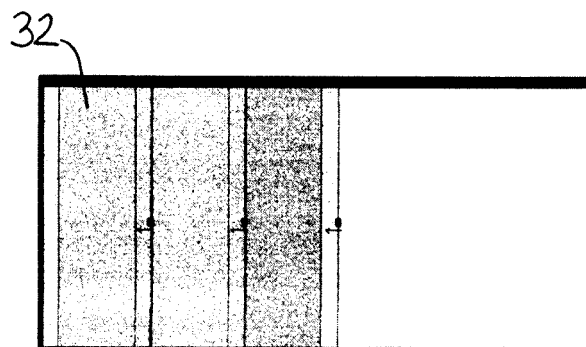


FIG. 10C

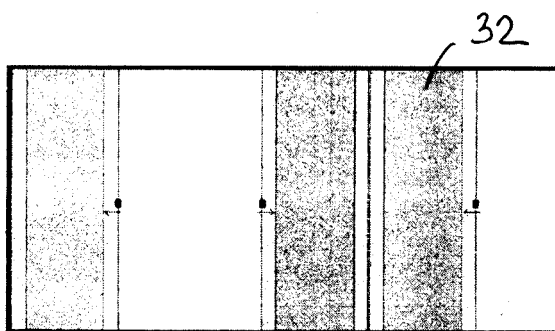


FIG. 10D



EUROPEAN SEARCH REPORT

Application Number
EP 14 39 6004

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			TECHNICAL FIELDS SEARCHED (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 20 April 2015	Examiner Rémondot, Xavier
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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