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(54) **Closure device**

(57) Enhanced enclosure, incorporating two vertical pillars (1) with anti-friction elements (5), encompassing their total height thereof defining two slots in which are guided the respective sides of an enclosing laminar element (4), related to a motor driven roller located in the upper pillar area, presenting the laminar element at its sides two stop alignments (6) that move vertically behind the anti-friction elements in order to attach the laminar ends to the pillars. The anti-friction elements may define one or more inlets allowing their freedom through the effect of pressure during the lowering motion of the laminar element.

This enclosure is used to seal an internal or external pass-through area, by way of a rolling laminar element.

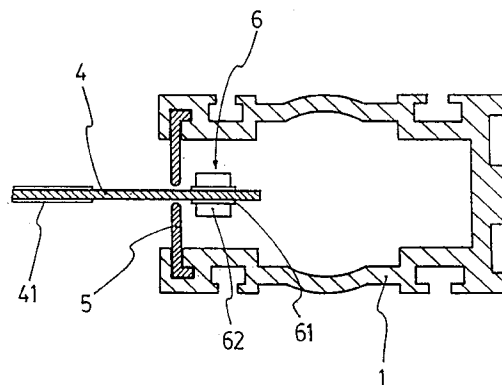


FIG. 3

This patent specification refers, as its name already indicates, to an enhanced enclosure device of the type employed in pass-through areas, either indoors or leading outdoors, and which are laterally bound by two vertical pillars, making up the means guiding a laminar element upwardly attached to a roller, capable of turning through the action of a motor element, in order to allow the rolling up and unrolling of the laminar element, thus obtaining the total or partial opening and closing of its internal opening.

The enclosure devices of this type, as already known, present two side pillars, preferably made of iron, with a substantial cross section and including complex means to prevent the laminar element from suffering a high degree of deformation whenever it is in the closing position and upon which acts a frontal pressure, simply caused by the wind or by the action of any other element.

These means are used rigidly in respect of the laminar element and of the pillars, and are acted upon by a motor element so that if the motor breaks down, the door shall then remain out of service until repaired by a technician, causing considerable problems to its user.

In external installations, where there are greater wind forces, and in order to prevent the laminar element from suffering deformations above a given limit, cross members are horizontally fixed above it, guided on pillars, so that upon transmitting to the lower element an upward or downward movement the laminar element unfolds or folds as applicable.

Some of the enclosure devices already known, in order to prevent a laminar element deformation due to a frontal pushing force, do incorporate inside the pillars pulling devices that act upon the fabric sides, generally made up of a combination of pulleys and springs, which poses the problem that the motor that moves the laminar element must have a higher power rating so as to overcome the effect of said pulling devices.

An enhanced enclosure device, object of this invention, has been designed to overcome the above problems, introducing a number of features that make it particularly simple, regarding its manufacturing, assembly and transportation, which reduces final cost, featuring furthermore this enclosure device the possibility of the laminar element being freed from the side profiles whenever it becomes subject to a previously determined pressure and that the laminar element freed from the profiles may return in the upward movement to the initial assembly position, so that in case of a fault being developed in the driving element, it does then not constitute a problem whatsoever that the laminar element may be in the closing position.

The enhanced enclosure device incorporates two vertical pillars, preferably made of aluminum, that support above it a turn enabled roller, in which the laminar element may be rolled up, so as to adopt an

opening or closing position in respect of the internal enclosure device opening.

The pillars are upwardly joined by a profile, to which are fixed water proof strips that make up, through one of the enclosure device sides, a small roof that covers the roller and the driving device and, at its opposite side, an element which purpose is to hide them from view.

The laminar element has, close to its side ends, two equidistant top alignment ends, through which it shall relate to the enclosure pillars.

Anti-friction devices are fitted upon each one of the pillars and opposite each other, presenting a certain elasticity and defining between them a vertical slot with amplitude enough to allow the laminar element to move through it; so that the top ends fixed upon the laminar body sides may thus travel vertically inside the profile, remaining hidden in the assembly position, so that whenever the laminar element is subjected to a frontal pressure the top ends act upon the internal side of the anti-friction elements, keeping the laminar element in place.

The top ends, in order to be able to carry out this holding action do obviously feature a thickness greater than the slots defined between the anti-friction elements and further define two low thickness portions located across each other, contacting upon the laminar element surfaces and causing the top ends and the laminar element to self center in respect of the slots whenever the laminar element is subjected to a pulling force, the top ends do furthermore present two lesser diameter end portions which purpose is to act upon the internal sides of the anti-friction elements offering resistance to the freedom of the laminar element.

Depending upon the total thickness of the top ends it may also be achieved that, whenever the laminar element is subjected to a previously determined pulling force, the top ends elastically deform the anti-friction elements, so as to appear through the slot, in order to make it possible that, if the motor breaks down when the laminar element is in the closing position, its sides may be freed without damaging the enclosure device.

The upper ends of the anti-friction elements are arranged slightly curved towards the inside of the enclosure device and define beveled cuts that widen the slot opening, which eases the descent of the laminar element and the guiding of the side top ends towards the inside of the pillars.

Should the lugs have been sized so that they may be freed from the anti-friction elements upon subjecting the laminar element to a frontal push, the anti-friction elements shall then be made up of two sections, a lower straight one and an upper one, having the lower end slightly curved towards the inside of the enclosure device so as to allow, during the rising motion of the laminar element, the entry of the pressure freed

top ends towards the inside of the pillars, thus returning to their original assembly position.

It has furthermore been foreseen the possibility of fixing upon the lower end of the laminar element a flexible element, slightly shorter than the former, which purpose is to keep the laminar element horizontally deployed which eases the return of the lugs, freed by pressure, to the inside of the intermediate pillars.

In order to better understand the object of this invention, the attached drawing shows a preferential embodiment thereof. In said drawing:

Figure 1 shows an elevation view of the enhanced enclosure device, partially open, in which the laminar element, one of the pillars and the upper roof have been partially cut away.

Figure 2 shows a profile view of the enclosure device, on which the portion of the laminar element running inside the profiles has been outlined.

Figure 3 shows a plan view of one of the pillars, cut by a horizontal plane, and the side of the laminar element with one of the top ends that relate it to the pillar.

Figure 4 shows an elevation view of the upper end of one of the pillars, centrally cut by a vertical plane, in which may be observed the arrangement of the anti-friction elements and of the top ends, entering one of them inside the profile during the upward rising movement, and in which the laminar element has not be shown so as to achieve a greater drawing clarity.

As it may be observed in the fore mentioned figures, the enclosure object of this invention is made up of two pillars (1) upwardly joined by a profile (2) making up a gantry like structure, to which a turn enabled roller (3) is fixed near its upward end, to which is attached the end of a laminar element (4) which sides are guided inside two slots defined by anti-friction elements (5) vertically attached upon the pillars (1), staying retained inside them by way of lugs (6) fixed upon the sides of the laminar element; in this way it is achieved that upon the roller turning in one or another direction the laminar element (4) rolls up or unrolls around the roller (3) effecting the opening or closure of the internal pass-through opening of the enclosure device.

The roller (3) has a central axis related to a driving device (7) by way of turning motion transfer means.

The pillars (1) are made up of two "U" shaped general section profiles which wings are internally fitted at their respective ends by way of mortises framed by the extensions (11), into which vertically fit the anti-friction elements (5) presenting a given flexibility, so as to centrally define a vertical slot into which is introduced the corresponding laminar element (4) side, enabling vertical sliding movement.

Near the sides of the laminar element is defined an stop (6) alignment, apt to be housed inside the pil-

lars (1), being located in the area behind the anti-friction elements (5), to hold the laminar element sides (4) upon the pillars (1).

These stops (6) define two reduced thickness central portions (61) and two end portions (62) with a greater thickness and lesser diameter than the prior ones, being the central portions (61) the ones that enclose the stops (6) in respect of the vertical slot, whenever the laminar element (4) is subjected to a pulling force in the pass-through direction.

Depending upon the total thickness of the stops (6) it may be achieved that they be incapable of passing through the slot defined by the anti-friction elements, independently of the pressure applied upon the laminar element (4) or that they may pass through upon applying a previously determined pressure, as a function of the thickness of the top ends (6).

Should the stops (6) be sized so that they may exit through the slot defined by the anti-friction elements (5) whenever the laminar element (4) receives a push in the passage direction, upon each one of the mortises of the pillars shall be arranged in the upper area an anti-friction element portion (51), which upper (52) and lower (53) ends are oriented towards the central enclosure area, so as to allow respectively the entry of the stops (6) towards the inside of the pillars whenever the laminar element lowers to effect the closure and whenever it rises towards the opening position, returning the side of the laminar element (4) to the assembly position, through the stop (6) guiding device and towards the inside of the pillars (1) as observed in figure 4.

In order to enable the upper (52) and lower (53) ends of the anti-friction portion (51) to be oriented towards the inside of the enclosure it is necessary to previously carry out a partial elimination of the extensions (11) of the pillars (1), leaving free said ends (51) and (52).

Upon the lower end of the laminar element (4) is arranged a flexible element (41) that tends to keep it horizontally deployed, which makes it possible that whenever the sides of the laminar element (4) have become free of the stops (6), they near the pillars (1) to be overcome during the rising movement by the lower end (53) of the portion (51).

Upon the profile (2) upwardly joining the pillars (1) is assembled a water proof strip (21) upwardly covering the roller (3) and the motor (7) and another vertically arranged water proof strip (22) partially closing the enclosure void so as to hide from view the roller (3) and the entry area of the laminar element towards the inside of the pillars (1).

Once the nature of the invention has been sufficiently described, together with a practical embodiment example thereof, it is hereby stated that in respect of the whole invention and the parts that make it up may be introduced whichever modifications may be considered appropriate, as long as its essential

features, claimed below, are not altered.

Claims

1.- Enhanced enclosure device, of the type employed at internal pass-through areas, laterally bound by two vertical pillars, making up the guide elements of a laminar element upwardly fixed to a roller, turn enabled through the action of a driving element, so as to allow a laminar element to roll up or unroll, characterized because upon each one of the pillars are fitted anti-friction elements, encompassing the whole height of the pillars and defining between them a slot with sufficient thickness to allow the displacement within it of the laminar element, presenting the sides of said laminar element two stop alignments, which may travel vertically inside the pillars, attached to the laminar element and acting upon the internal sides of the anti-friction elements whenever the laminar element is subjected to a frontal pushing force in the pass-through direction.

2.- Enhanced enclosure device, as per the prior claim, characterized because the pillars are upwardly joined by way of a profile, to which are attached water proof strips that make up, on one of the sides of the enclosure, a roof that covers the cylinder and the driving element and, on the opposite side, a further element to hide them from view.

3.- Enhanced enclosure device, as per the foregoing claims, characterized because upon the lower end of the laminar element is fixed a flexible and slightly shorter element, which purpose is to keep the laminar element horizontally deployed.

4.- Enhanced enclosure device, as per the foregoing claims, characterized because the stops define two low thickness portions set against each other, contacting upon the surfaces of the laminar element, making up laminar element centering means in respect of the slots defined by the anti-friction elements and two lesser diameter end portions, which purpose is to act upon the internal sides of the anti-friction elements whenever the laminar element is subjected to a frontal pressure.

5.- Enhanced enclosure device, as per the foregoing claims, characterized because the anti-friction elements have their upper ends slightly curved towards the inside of the enclosure, so as to guide the side top ends of the laminar element towards the inside of the pillars whenever the laminar element is descending.

6.- Enhanced enclosure device, as per the foregoing claims, characterized because the total thickness of the stops fixed upon the sides of the laminar element have a thickness slightly greater than the slot defined by the guiding elements, so that they may arise through said slot, elastically deforming the guiding elements, whenever the laminar element is sub-

jected to a previously determined frontal push or pressure.

7.- Enhanced enclosure device, as per the foregoing claims, characterized because the guiding elements assembled upon pillars are made up of two tracks, a lower straight one and an upper one, which upper and lower ends are slightly curved towards the inside of the enclosure so as to respectively allow the guiding of the stops of the laminar element towards the inside of the pillars during the laminar element lowering movement and during the rising movement, when the stops have been freed from the guiding elements by the effect of pressure upon the laminar element.

8.- Enhanced enclosure device, as per claims 1, 2, 3, 4 and 5; characterized because the total thickness of the stops, fixed upon the sides of the laminar elements, is sufficiently high to prevent their exit through the slot defined by the guiding elements, independently of the frontal push that the laminar element may receive.

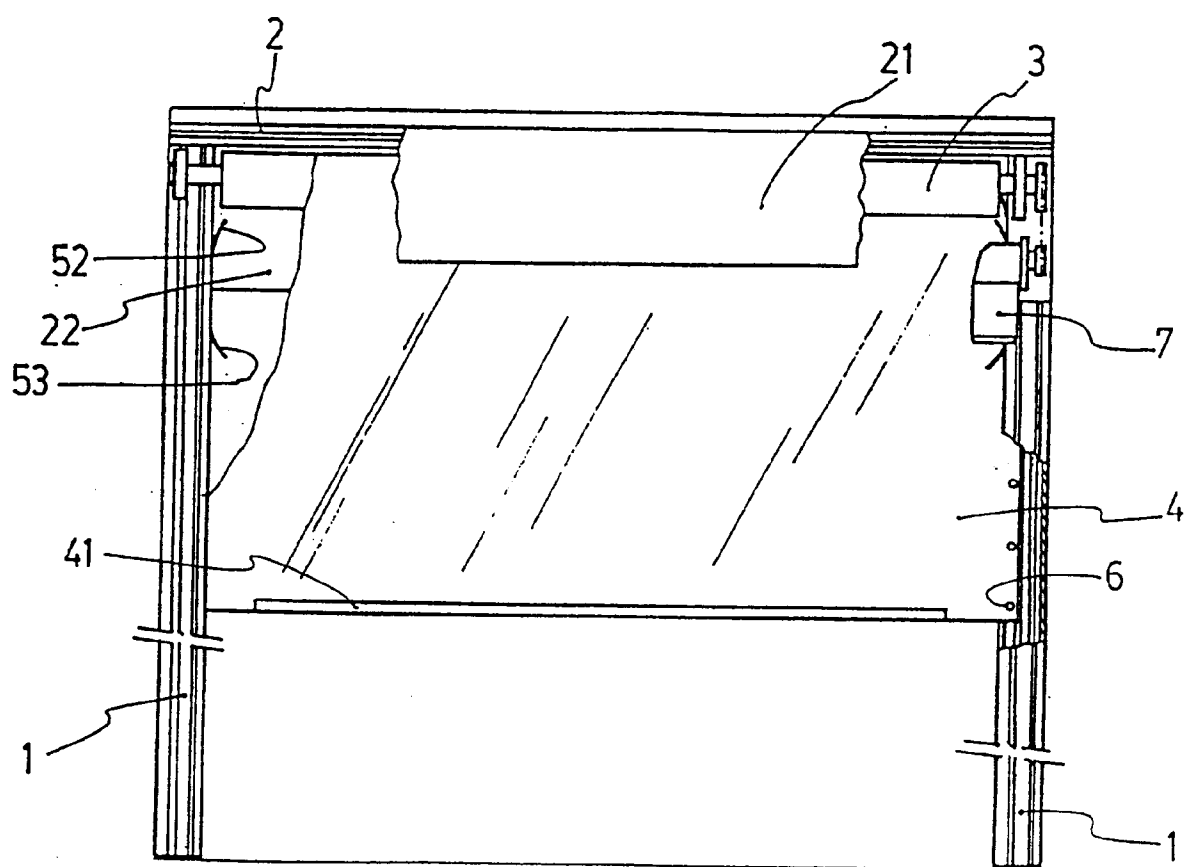


FIG. 1

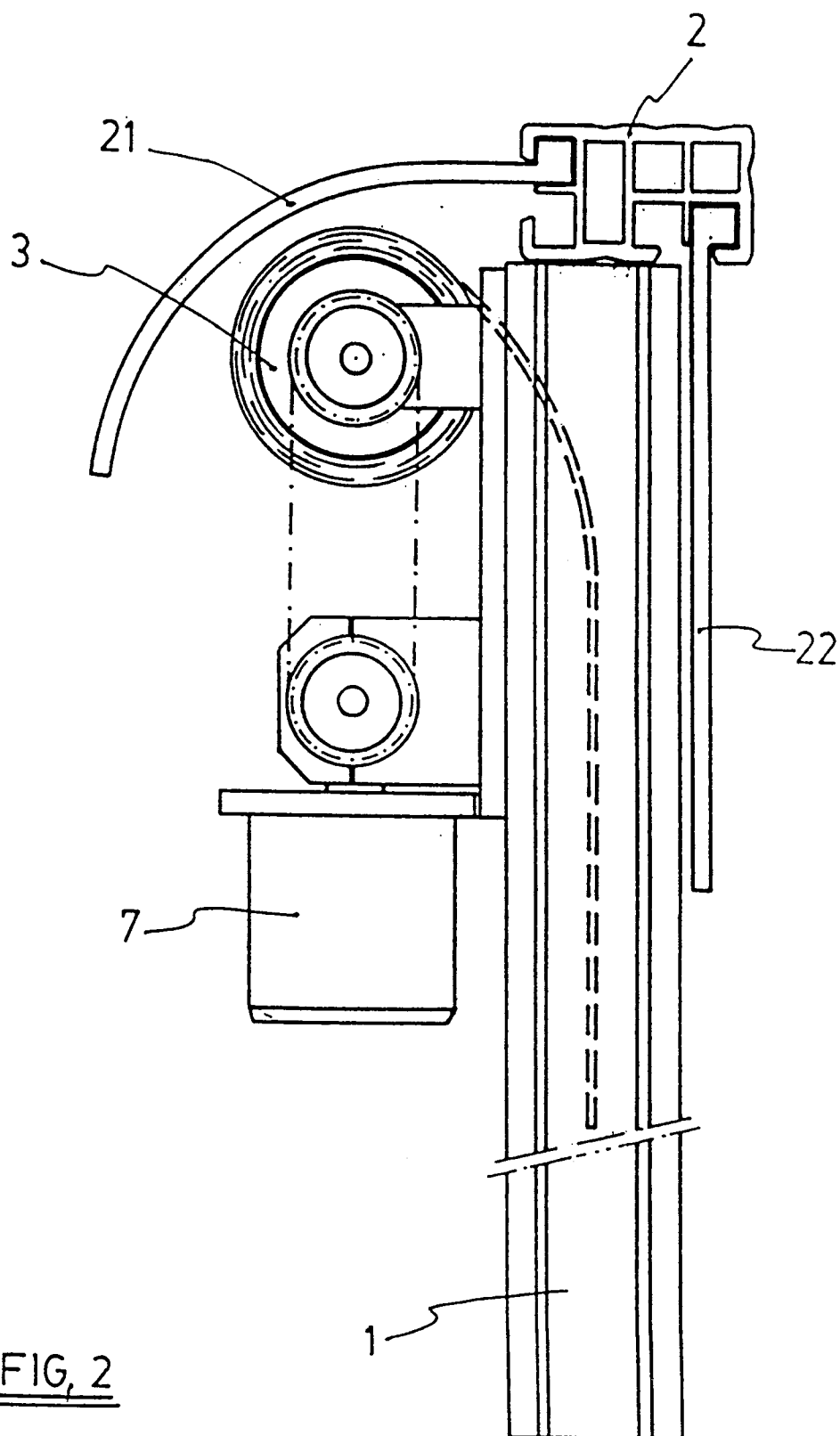


FIG. 2

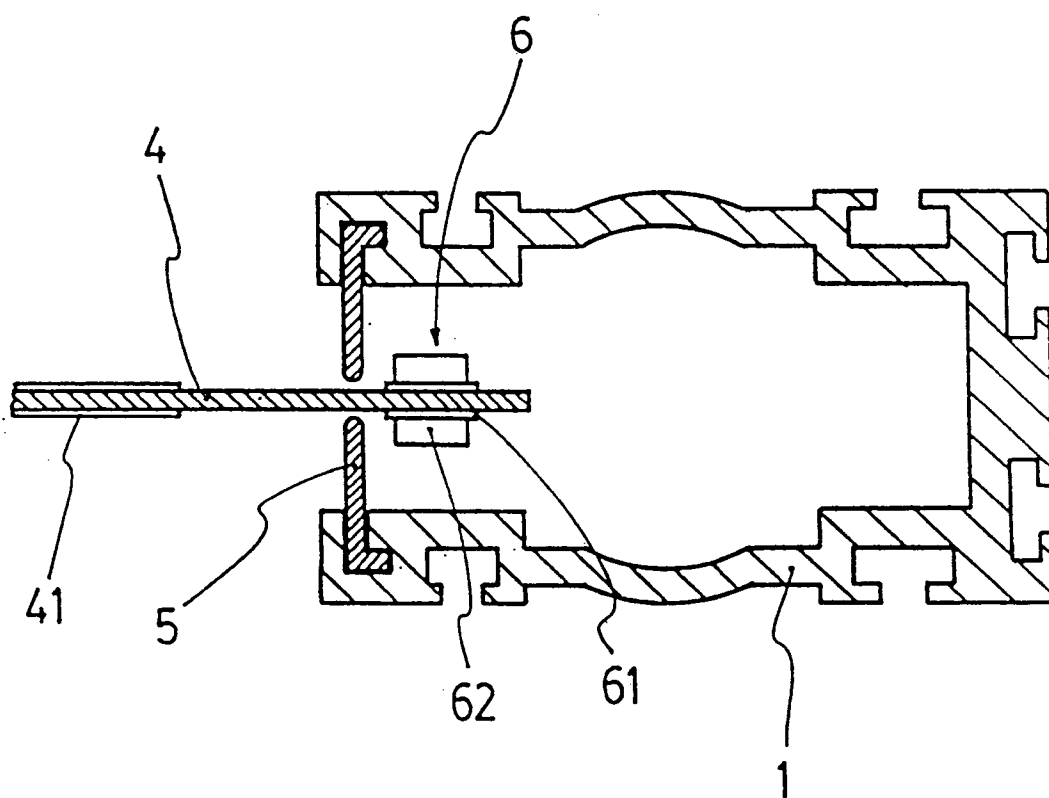


FIG. 3

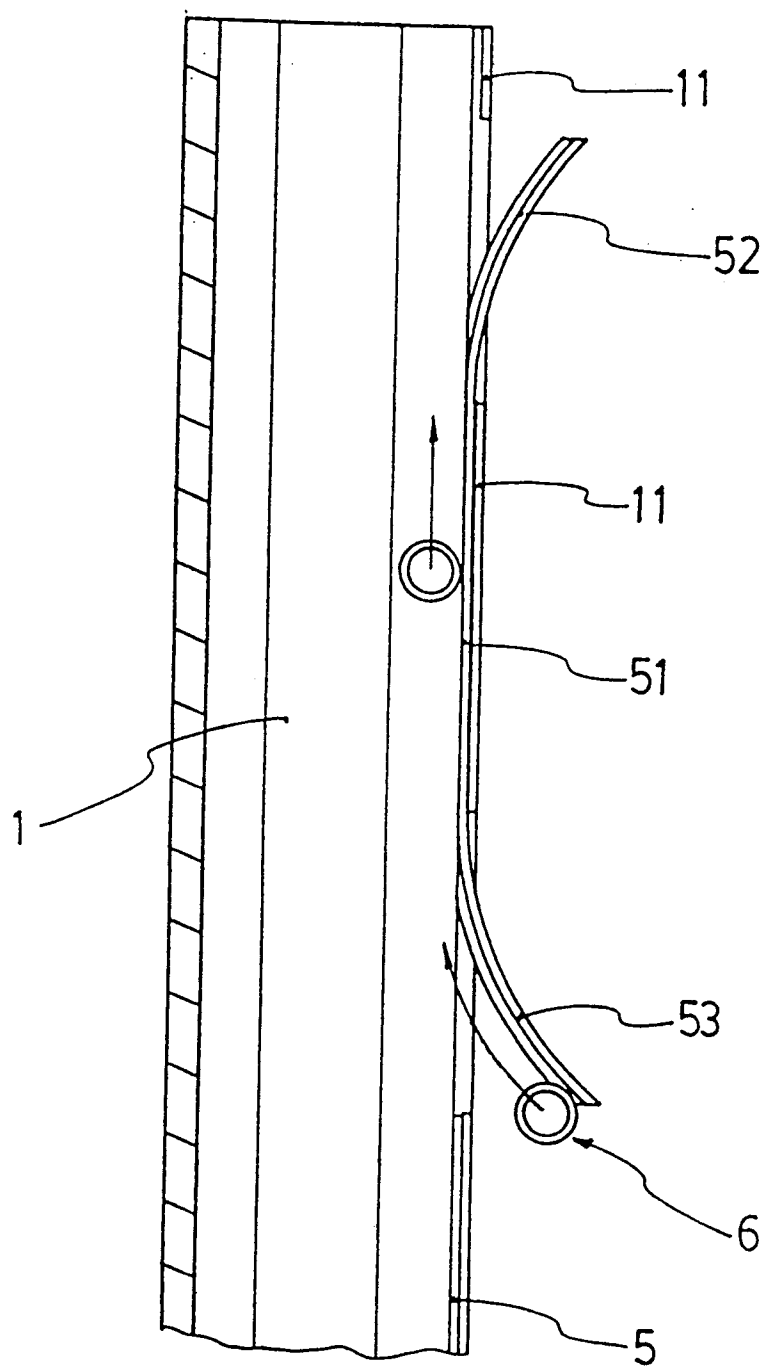


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 95 50 0086

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.6)
X Y	US-A-4 884 617 (COENRAETS) * column 2, line 17 - column 4, line 5; figures * ---	1,6,8 2,3	E06B9/58
X A	CA-A-1 224 402 (TAYLOR) * page 8, line 1 - page 10, line 4; figures * ---	1,6 5	
Y	EP-A-0 507 136 (KRALER) * figures * ---	2	
Y A	US-A-4 478 268 (PALMER) * the whole document * ---	3 1,5	
A	EP-A-0 157 198 (SCHIEFFER) * page 4, paragraph 5 - page 6, paragraph 1; figures * -----	1,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 September 1995	Examiner Fordham, A
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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