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54 Detergent dispenser compartment for washing machines.

(57) The detergent dispenser compartment for washing machines comprises a container which is adapted to contain the detergent and is angularly rotatable about a vertical axis between a working position arranged below delivery means for the washing water, inside the machine, and a detergent loading position which protrudes outside the washing machine.

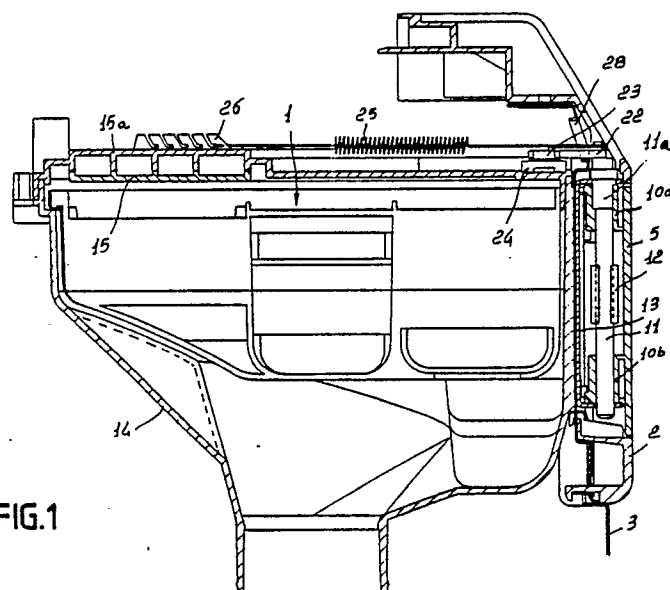


FIG.1

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DETERGENT DISPENSER COMPARTMENT FOR WASHING MACHINES

The present invention relates to a detergent dispenser compartment for washing machines.

As is known, washing machines generally have a drawer-like detergent dispenser compartment, constituted by a container adapted to be filled with an appropriate dose of detergent and to be subsequently crossed by a flow of conveying water. The container is usually divided into a series of chambers separated by adapted partitions so as to contain the detergents and additives to be used in the different washing steps. Each of said chambers must naturally be connected, in operating position, with appropriate ducts for the inflow and outflow of water.

In conventional washing machines the dispenser compartment is mounted longitudinally slidable on adapted guides so that it can be extracted to fill it with detergent at each operating cycle. The user must therefore open the dispenser manually.

The above type of detergent dispenser compartment often risks jamming during its opening and closure movements, due to the deposits which may form on its sliding guides in the course of time. Besides, said deposits are increased by the detergent (especially by liquid detergents, such as some additives) which easily spills from the container during the movements of the dispenser compartment indeed due to the difficult sliding thereof. To conclude, the result is that such detergent dispensers compartments are generally rather difficult to open and close and are subject to possible malfunctions.

The aim of the present invention is to solve the above described problem by providing a detergent dispenser compartment for washing machines which is easy to open and close and in particular allows automatic pushbutton-operated opening.

Within the scope of this aim, a further object of the present invention is to provide a detergent dispenser compartment which is simple in concept, safely reliable in operation and versatile in use in relation to the different types of washing machines.

This aim and this object are both achieved, according to the invention, by the present detergent dispenser compartment for washing machines, which is characterized in that it comprises a container which is adapted to contain said detergent and is angularly rotatable about a vertical axis between a working position arranged below delivery means for the washing water inside the washing machine, and a detergent loading position, protruding outside said washing machine.

The details of the invention will become apparent from the detailed description of a preferred embodiment of the detergent dispenser compart-

ment for washing machines, illustrated by way of non-limitative example in the accompanying drawing, wherein:

figure 1 is a vertical sectional view of the detergent dispenser compartment according to the invention;

figure 1A is a partial sectional view taken parallel and proximate to the sectional view of the preceding figure;

figure 2 is a plan view of the dispenser compartment in its detergent loading position;

figures 3 and 4 are respectively a horizontal sectional view and a front view of an element for opening the compartment, in the washing machine's working position; and

figure 5 is a horizontal sectional view of said element for opening the compartment, in the detergent loading position.

With particular reference to the above described figures, the reference numeral 1 generally indicates the detergent dispenser compartment for washing machines. The compartment 1 is in the shape of a circular sector and is mounted rotatably about a vertical axis arranged substantially at the center of curvature of said circular sector within a control panel 2 rigidly associated with the front panel 3 of the washing machine. Said circular sector substantially extends for a quarter of a circumference.

The compartment 1 is constituted by a container 4 adapted to be filled with detergent and removably mounted on a corresponding support 5. Said support 5 defines a substantially C-shaped front guide in which the container 4 is slidably mounted so that it can be extracted completely when the compartment is rotated to its detergent loading position.

The container 4 internally defines a pair of parallel partitions 6a, 6b which delimit a series of chambers 7, 8 and 9 intended, as described in greater detail hereinafter, to contain the washing detergent, the pre-washing detergent and any additives. The support 5 defines a pair of sleeves 10a, 10b for coupling to a pivot 11 which defines the axis of rotation of the compartment. The pivot 11 has an enlarged portion 11a with a longitudinal flattened region intended to rigidly angularly couple said pivot to the support 5. The container 4 is furthermore coupled on the pivot 11 by means of an elastic fork 12 protrudingly defined by said container on the edge of the face mounted adjacent to the front portion of the support 5.

The pivot 11 is pivoted on a bracket 13 defined in a recess of the control panel 2. The compart-

ment is rotatable between a working position and a loading position, which is substantially rotated through 90 degrees with respect to the first position and in which it protrudes from the machine. In working position (fig. 1) the compartment is inserted in a hopper 14 for the outflow of the washing water.

The hopper 14 is upwardly closed by a cover 15 in which appropriate channels for the delivery of the washing water are defined. In particular (as illustrated in figure 2, wherein said cover is shown without the upper portion 15a), the cover 15 has, on one side, a series of partitions 16a, 16b, 16c which define channels 17a, 17b, 17c respectively connected to the delivery openings for the washing water at high and low temperature, for the additive entrainment water and for the pre-washing water.

Further partitions 18 direct the washing and prewashing water from the channels 17a, 17c towards the openings 19a, 19c, respectively connected to said chambers 7, 8 of the container 4, while the channel 17b ends with the opening 19b for inflow into the compartment 9; it should be noted that the openings 19a, 19b, 19c are arranged at a respective end of the chambers 7, 8, 9 in the compartment's working position. A pair of annular channels 20, having a uniformly distributed plurality of small holes 21 for washing the boundary surfaces of the chambers 7 and 8, furthermore extends from the partitions 18. The chambers 7 and 8, which usually contain detergent in powder form, are therefore affected both by the water exiting from the openings 19a, 19c and by the water which is sprinkled from the holes 21 on the related boundary surfaces, ensuring a complete entrainment of the detergent.

At the top, the pivot 11 defines a toothed sector 22 which meshes with a pinion 23 the axle whereof is mounted with friction on a support 24. An end of a spring 25 for opening the compartment is rigidly coupled to one end of the toothed sector 22; at its other end, said spring is rigidly coupled in an adjustable position on a series of hooks 26 defined above the cover 15 of the hopper 1.

An actuation element 27 for opening the compartment is arranged on a crosspiece 28 to the side of said compartment. Said actuation element has an opening pushbutton 29 which can be actuated in a conventional manner against the elastic biasing action of a spring 30. The actuation of the pushbutton 29 actuates the sliding, against the biasing action of a related spring 31, of a slider 32 which has, at one end, a wedge 32a engaged by a wing 33 of said pushbutton.

The slider 32 defines a lower enlarged portion 34 adapted to engage a tooth 35 defined by the compartment so as to lock it. At the other end, the slider defines an axial dowel 36 adapted to enter a

hole 37 provided laterally on the start button 38 of the machine, so as to prevent its actuation when the compartment is open.

The operation of the detergent dispenser compartment is easily understandable from the above description. In the washing machine's working position, the compartment 1 is arranged inside the hopper 14 (figure 1) so that the washing water can flow through it and convey the detergent. In this position the compartment is locked by the enlarged portion 34 which engages the tooth 35 (figures 3 and 4). It should be noted that the sliding of the slider 32 is prevented after the start pushbutton 28 has been actuated, as the dowel 36 acts on the side of said pushbutton, and the actuation of the opening pushbutton 29 is also prevented.

Vice versa, when the machine is off the opening pushbutton 29 can be actuated, causing the sliding of the slider 32, as the dowel 36 enters the hole 37 of the start pushbutton 38 (figure 5). This sliding releases the compartment 1, as the related tooth 35 is disengaged from the enlarged portion 34 of said slider.

The compartment opens automatically, actuated by the spring 25 which rotates the pivot 11 to which the support 5 of the container 4 is coupled. This rotation extends through approximately 90 degrees, to abut a shoulder 39 of the compartment on the panel of the washing machine, so as to move said compartment to a loading position which protrudes substantially completely from the washing machine. It should be noted that the action of the spring 25, which has an adjustable tension, is damped by the friction element 24 which acts on the pivot 11 by means of the gear 22-23.

The closure of the compartment is instead performed manually by rotating it in reverse until the tooth 35 is locked by the enlarged portion 34. In order to prevent jammings during this step, the end of the enlarged portion 34 and the back of the tooth 35 are conveniently rounded.

To conclude, the detergent dispenser compartment according to the invention allows to easily and rapidly perform the opening and closure operations; in particular, the compartment can be opened with a pushbutton by means of simple mechanical elements. The fact should furthermore be noted that the risks of jamming due to deposits, observed in conventional dispenser compartments which slide on guides, are avoided, since the compartment is rotatable.

In the practical embodiment of the invention, the materials employed, as well as the shapes and dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole pur-

pose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

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Claims

1. Detergent dispenser compartment for washing machines, characterized in that it comprises a container which is adapted to contain said detergent and is angularly rotatable about a vertical axis between a working position arranged below delivery means for the washing water, inside the washing machine, and a detergent loading position, protruding outside said washing machine.

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2. Compartment according to claim 1, characterized in that said container has the shape of a circular sector and is rotatably mounted about a vertical axis arranged substantially at the center of curvature of said circular sector.

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3. Compartment according to claim 1, characterized in that it comprises an opening actuation element having a pushbutton adapted to actuate the sliding of a slider which defines an enlarged portion adapted to engage, in the washing machine's working position, a tooth defined by the compartment so as to release said tooth.

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4. Compartment according to claim 3, characterized in that said slider defines an axial dowel adapted to enter a hole provided laterally on the power-on pushbutton of the washing machine, so as to prevent its actuation when the compartment is open.

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5. Compartment according to claim 1, characterized in that said container is removably mounted on a support coupled to a pivot which constitutes the axis of rotation of said compartment.

6. Compartment according to claim 1, characterized in that it comprises an opening spring adapted to angularly rotate a pivot which constitutes the axis of rotation of said compartment.

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7. Compartment according to claim 6, characterized in that said pivot defines a toothed sector which meshes with a pinion which is mounted with friction, an end of said opening spring of the compartment being rigidly coupled at one end of said toothed sector, said spring being rigidly coupled, at its other end, in an adjustable position.

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8. Compartment according to claim 2, characterized in that said circular sector substantially extends for a quarter of a circumference.

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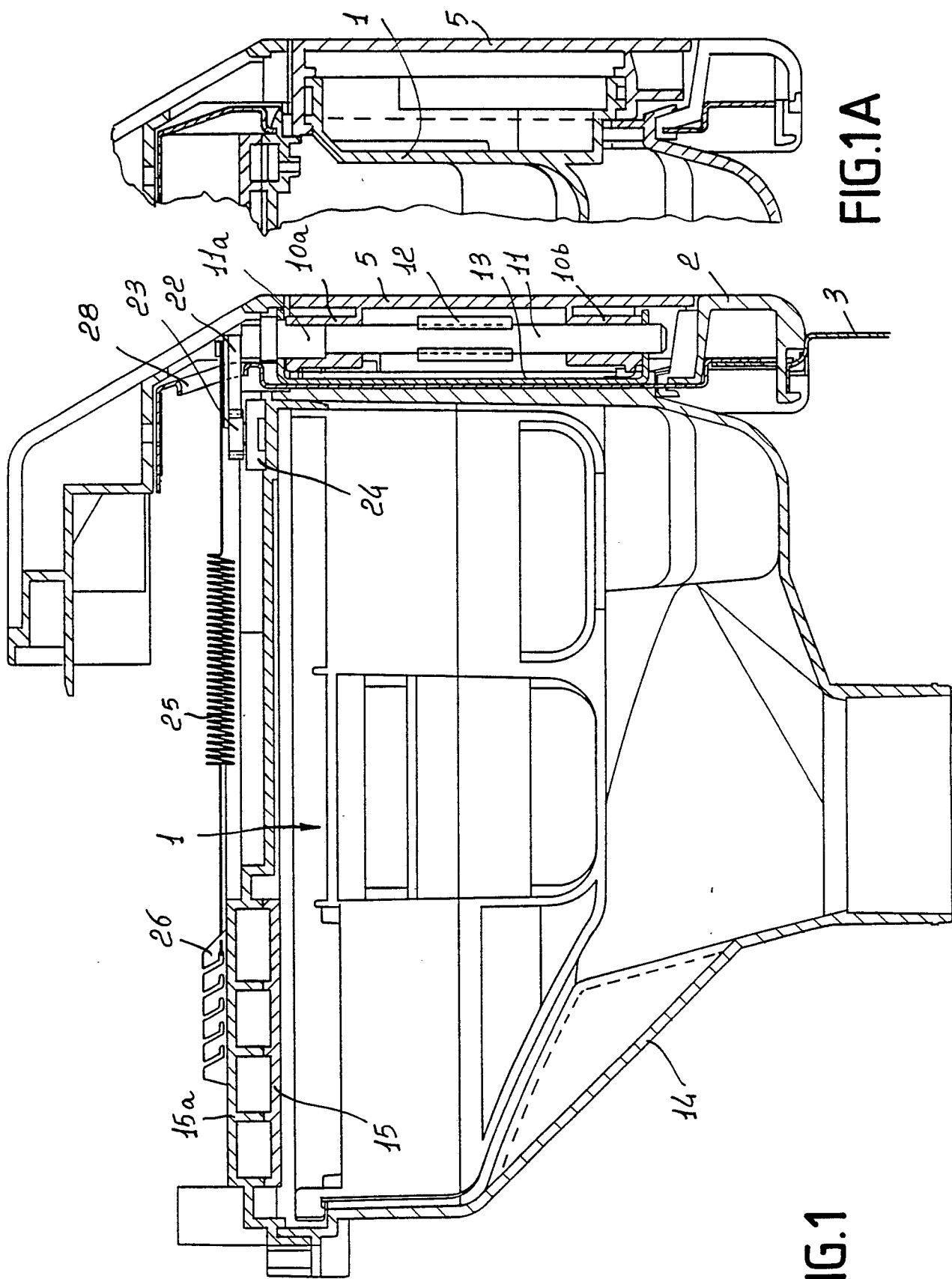


FIG.1

FIG.1A

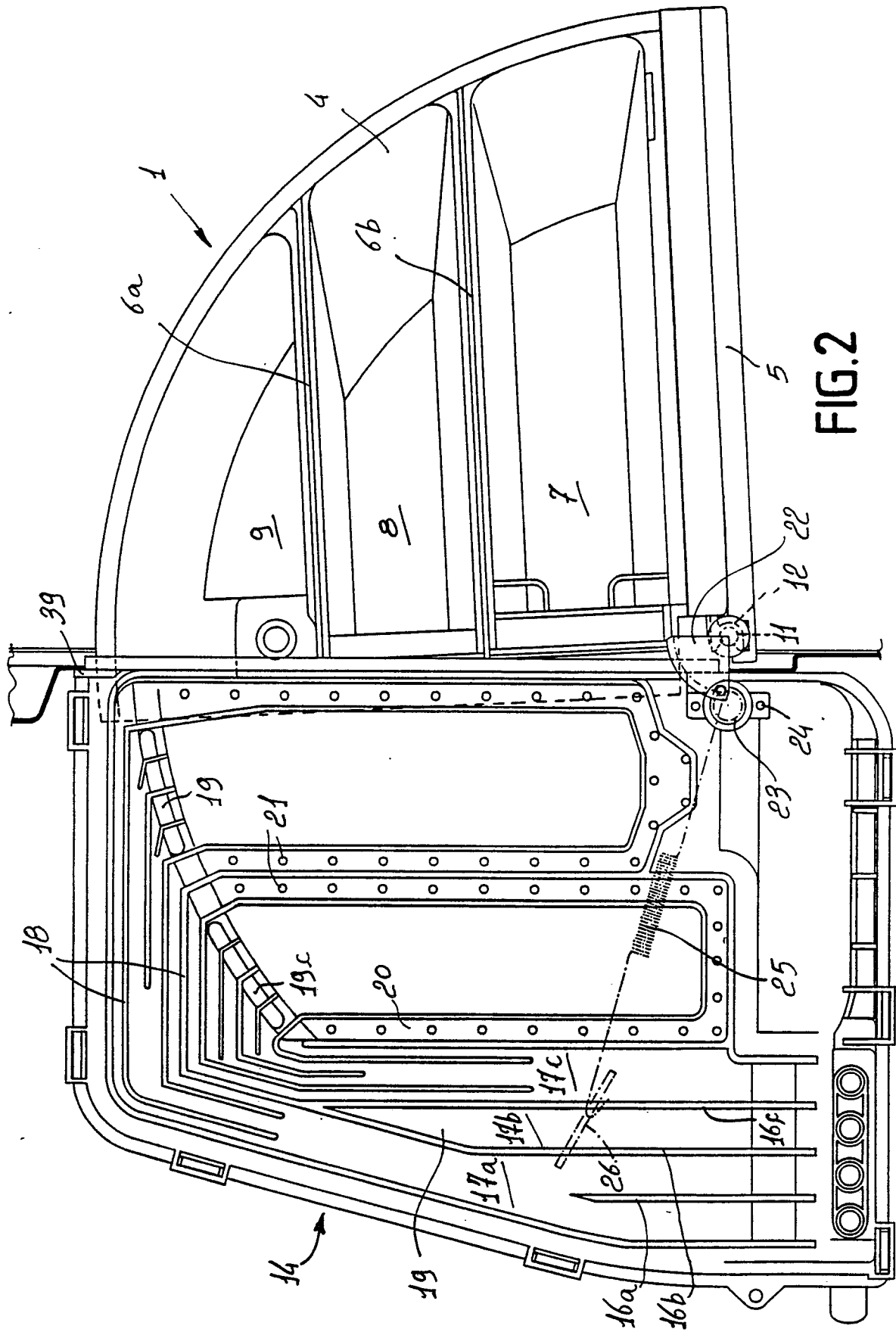


FIG. 2

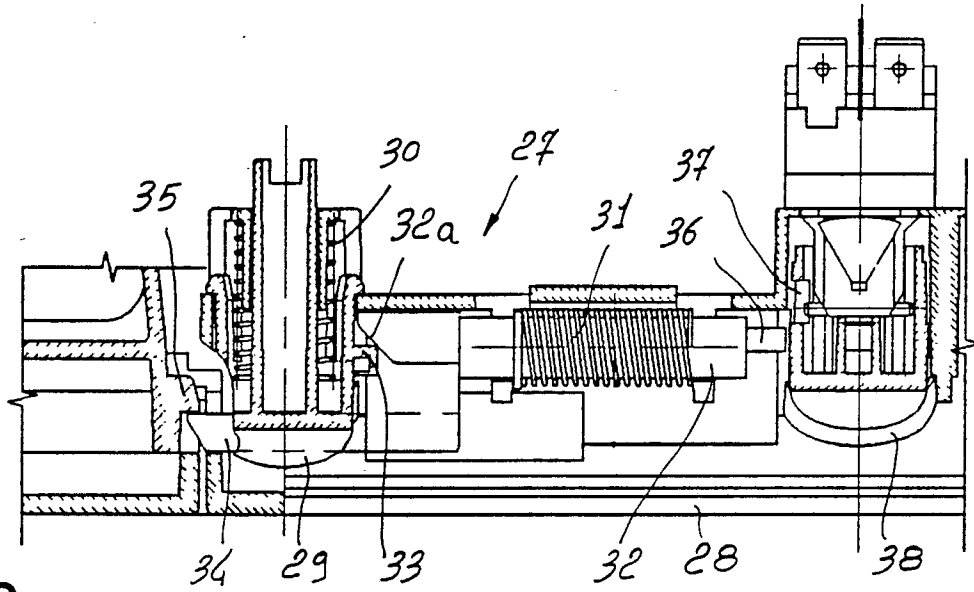


FIG. 3

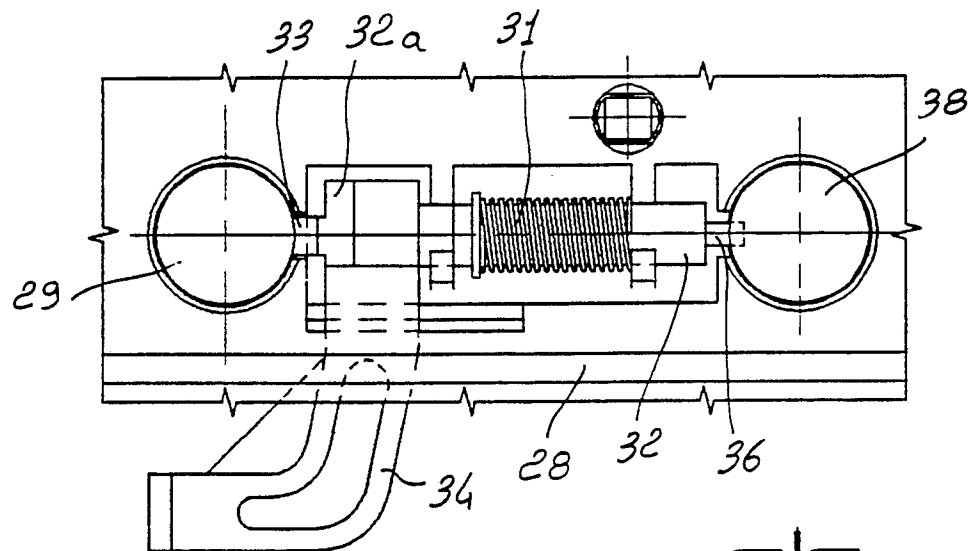


FIG. 4

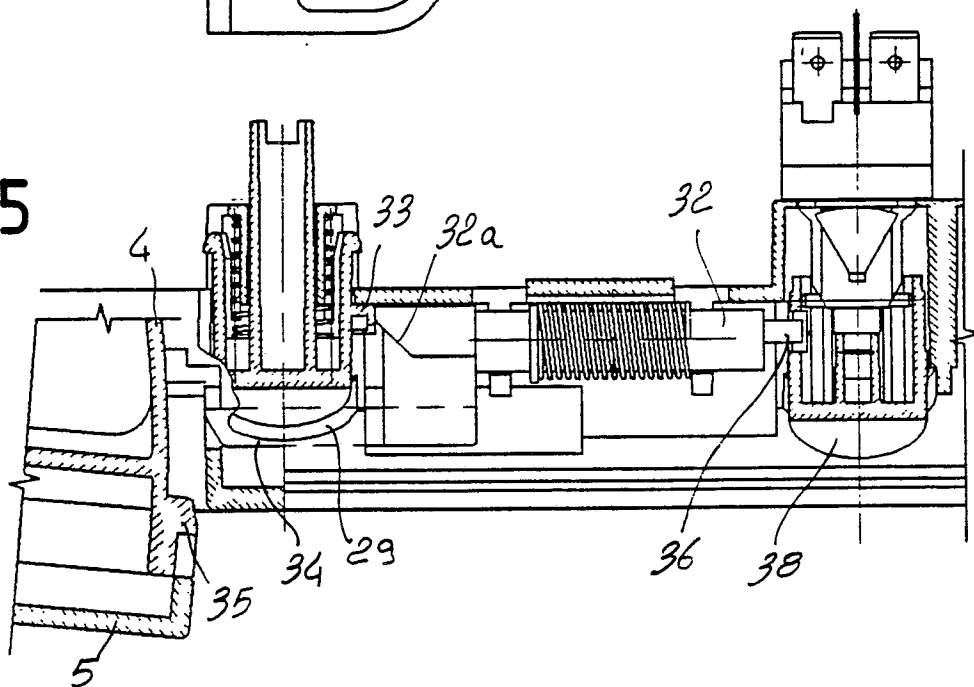


FIG. 5