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54 **Detergent dispenser compartment for washing machines.**

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73 Proprietor: **MERLONI ELETTRODOMESTICI S.p.A.**
Viale Aristide Merloni, 45
I-60044 Fabriano (AN)(IT)

72 Inventor: **Amati, Lucio**
Via Campanelli 7
IT-62024 Matelica (Prov.Macerata)(IT)

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Description

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

As is known, washing machines generally have a drawerlike 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.

From GB-1264739 it is also known a programmable additive dispenser for a washing machine, presenting a rotably mounted detergent receptacle which must be opened manually; said dispenser also suffers the lamented jamming risks due to the fact that the receptacle, which has the shape of a 180 degrees circular sector, cannot be removed for the cleaning of the dispenser.

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 type of washing machines.

This aim and this object are both achieved, according to the invention, by a detergent dispenser compartment for washing machines, comprising 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, said container having the shape of a circular sector and being rotably mounted about a vertical axis arranged substantially at the center of curvature of said circular sector, characterized in that it comprises support means which allows said container to be removed when the said compartment is in the said detergent loading position.

The details of the invention will become apparent from the detailed description of a preferred embodiment of the detergent dispenser compartment 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 5A 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 11 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 compartment 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 pre-washing 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 chamber 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 14.

An actuation element 27 for opening the compartment is arranged on a crosspiece 28 to the side of said compartment. Said actuation element 27 has an opening pushbutton 29 which can be actuated in a conventional manner against the elas-

tic 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 a power-on pushbutton 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 power-on pushbutton 38 has been actuated, as the dowel 36 acts on the side of said power-on pushbutton 38, 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 power-on pushbutton 38 (figure 5). This sliding releases the compartment 1, as the related tooth 35 is disengaged from the enlarged portion 34 of said sliders 32.

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.

Claims

1. Detergent dispenser compartment (1) for washing machines, comprising a container (4) which is adapted to contain said detergent and is angularly rotatable about a vertical axis between a working position arranged below delivery means (16-21) for the washing water, inside the washing machine, and a detergent loading position, protruding outside said washing machine, said container (4) having the shape of a circular sector and being rotatably mounted about a vertical axis arranged substantially at the center of curvature of said circular sector, characterized in that it comprises support means (5, 5A, 11, 12) which allows said container (4) to be removed when the said compartment (1) is in the said detergent loading position. 10
2. Compartment according to claim 1, characterized in that said vertical axis of rotation is external to said container (4). 15
3. Compartment according to claim 1, characterized in that said means (5, 5A, 11, 12) comprises a support (5) defining a front guide (5A) in which said container (4) is slidably mounted, said support (5) being coupled to a pivot (11) which constitutes the said vertical axis of rotation. 20
4. Compartment according to claim 3, characterized in that said pivot (11) is pivoted on a bracket (13) defined in a recess of the control panel (2) of the washing machine. 25
5. Compartment according to claim 1 or 3, characterized in that said means (5, 5A, 11, 12) comprises an elastic fork (12) for coupling said container (4) to said pivot (11). 30
6. Compartment according to claim 5, characterized in that said elastic fork (12) is protrudingly defined by said container (4) on the edge of the face mounted adjacent to the front portion of said support (5). 35
7. Compartment according to claim 1, characterized in that it comprises an opening actuation element (27) having a pushbutton (29) adapted to actuate the sliding of a slider (32) which defines an enlarged portion (34) adapted to engage, in the washing machine's working po- 40

sition, a tooth (35) defined by the compartment (1) so as to release said tooth (35).

8. Compartment according to claim 7, characterized in that said slider (32) defines an axial dowel (36) adapted to enter a hole (37) provided laterally on the power-on pushbutton (38) of the washing machine, so as to prevent its actuation when the compartment (1) is open. 45
9. Compartment according to claim 1, characterized in that it comprises an opening spring (25) adapted to angularly rotate the pivot (11) which constitutes the axis of rotation of said compartment (1). 50
10. Compartment according to claim 9, characterized in that said pivot (11) defines a toothed sector (22) which meshes with a pinion (23) which is mounted with friction, an end of said opening spring (25) of the compartment (1) being rigidly coupled at one end of said toothed sector (22), said spring (25) being rigidly coupled, at its other end, in an adjustable position. 55
11. Compartment according to claim 1, characterized in that said circular sector substantially extends for a quarter of a circumference.

Patentansprüche

1. Waschmittelverteiltisch (1) für Waschmaschinen, bestehend aus einem Behälter (4), der zum Fassen des Waschmittels ausgelegt und winkelförmig verschwenkbar ist um eine vertikale Achse zwischen einer Betriebsstellung unterhalb des Verteilsystems (16-21) für das Waschwasser, innerhalb der Waschmaschine, und einer Waschmitteleinfüllstellung, an der Außenseite der Waschmaschine hervorste- 10
hend, wobei der Behälter (4) die Form eines Kreissektors hat und drehbar an einer Vertikalachse montiert ist, die im wesentlichen im Krümmungszentrum des Kreissektors angeordnet ist, **dadurch gekennzeichnet**, daß es Halteeinrichtungen (5, 5A, 11, 12) aufweist, die es erlauben, den Behälter zu entfernen, wenn das Fach (1) sich in Waschmitteleinfüllstellung befindet. 15
2. Fach nach Anspruch 1, dadurch gekennzeichnet, daß die vertikale Schwenkachse sich außerhalb des Behälters (4) befindet. 20
3. Fach nach Anspruch 1, dadurch gekennzeichnet, daß die Halteeinrichtungen (5, 5A, 11, 12) einen Halter (5) mit einer Kopfführung (5A) 25

aufweisen, in welcher der Behälter (4) gleitend befestigt ist, welcher Halter (5) an einen Drehzapfen (11) angekoppelt ist, der die vertikale Schwenkachse bildet.

4. Fach nach Anspruch 3, dadurch gekennzeichnet, daß der Drehzapfen (11) drehbar an einem Träger (13) gelagert ist, der in einer Vertiefung der Bedieneinrichtung (2) der Waschmaschine angeordnet ist.
5. Fach nach Anspruch 1 oder 3, dadurch gekennzeichnet, daß die Halteeinrichtungen (5, 5A, 11, 12) einen elastischen Gabelhalter (12) für die Ankopplung des Behälters (4) an den Schwenkzapfen (11) aufweisen.
6. Fach nach Anspruch 5, dadurch gekennzeichnet, daß der elastische Gabelhalter (12) hervorstehend aus dem Behälter (4) an der Kante der Fläche vorgesehen ist, die an dem Frontteil des Halters (5) anliegt.
7. Fach nach Anspruch 1, dadurch gekennzeichnet, daß es eine Öffnungs-Betätigungseinrichtung (27) mit einer Drucktaste (29) aufweist, die adaptiert ist zum Bewirken der Gleitbewegung eines Gleitelementes (32), das einen verlängerten Abschnitt (34) aufweist, der adaptiert ist zum Einkuppeln eines Anschlages (35) an dem Fach (1), um den Anschlag (35) freizugeben.
8. Fach nach Anspruch 7, dadurch gekennzeichnet, daß das Gleitelement (32) einen axialen Stift (36) aufweist, der angepaßt ist, um in ein Loch einzugreifen, das seitlich an der Drucktaste (38) des Netzschalters der Waschmaschine vorgesehen ist, um deren Betätigung zu verhindern, wenn das Fach (1) offen ist.
9. Fach nach Anspruch 1, dadurch gekennzeichnet, daß eine Öffnungsfeder (25) zur Winkeldrehung des Drehzapfens vorgesehen ist, der die Schwenkachse des Faches (1) bildet.
10. Fach nach Anspruch 9, dadurch gekennzeichnet, daß der Drehzapfen (11) einen mit Zähnen versehenen Sektor (22) aufweist, der in ein Ritzel (23) eingreift, das unter Reibung gelagert ist, und daß das eine Ende der Öffnungsfeder (25) des Faches (1) fest an einem Ende des mit Zähnen versehenen Sektors (22) angekoppelt und an dem anderen Ende in einer verstellbaren Position befestigt ist.
11. Fach nach Anspruch 1, dadurch gekennzeichnet, daß der kreisförmige Sektor sich wesent-

lich über ein Viertel des Umfangs erstreckt.

Revendications

- 5 1. Compartiment distributeur de détersif (1) pour machines à laver, comprenant un conteneur (4) qui est adapté pour contenir ledit détersif et qui peut tourner angulairement autour d'un axe vertical entre une position de travail disposée au-dessous de moyens d'amenée (16 à 21) de l'eau de lavage, à l'intérieur de la machine à laver, et une position de chargement du détersif, en saillie à l'extérieur de ladite machine à laver, ledit conteneur (4) ayant la forme d'un secteur de cercle et étant monté pour tourner autour d'un axe vertical agencé sensiblement au centre de courbure dudit secteur de cercle, caractérisé en ce qu'il comprend des moyens de support (5, 5A, 11, 12) qui permettent de retirer ledit conteneur (4) lorsque ledit compartiment (1) se trouve dans ladite position de chargement du détersif.
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- 25 2. Compartiment selon la revendication 1, caractérisé en ce que ledit axe de rotation vertical est extérieur audit conteneur (4).
- 30 3. Compartiment selon la revendication 1, caractérisé en ce que lesdits moyens (5, 5A, 11, 12) comprennent un support (5) définissant un guide avant (5A) dans lequel ledit conteneur (4) est monté coulissant, ledit support (5) étant couplé à un pivot (11) qui constitue ledit axe de rotation vertical.
- 35 4. Compartiment selon la revendication 1, caractérisé en ce que ledit pivot (11) est monté pivotant sur une ferrure (13) définie dans un renforcement du panneau de commande (2) de la machine à laver.
- 40 5. Compartiment selon la revendication 1 ou 3, caractérisé en ce que lesdits moyens (5, 5A, 11, 12) comprennent une fourchette élastique (12) servant à accoupler ledit conteneur (4) audit pivot (11).
- 45 6. Compartiment selon la revendication 5, caractérisé en ce que ladite fourchette élastique (12) est formée en saillie sur ledit conteneur (4), sur le bord de la face qui est montée adjacente à la partie avant dudit support (5).
- 50 7. Compartiment selon la revendication 1, caractérisé en ce qu'il comprend un élément d'actionnement d'ouverture (27) possédant un bouton poussoir (29) adapté pour actionner le coulisement d'un coulisseau (32) qui possède
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une partie élargie (34) adaptée pour retenir, dans la position de travail de la machine, une dent (35) définie par le compartiment (1) de manière à libérer ladite dent (35).

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- 8.** Compartiment selon la revendication 7, caractérisé en ce que le coulisseau (32) présente un téton axial (36) adapté pour pénétrer dans un trou (37) prévu latéralement dans le bouton poussoir de marche (38) de la machine à laver de manière à empêcher l'actionnement de celui-ci lorsque le compartiment (1) est ouvert. 10
- 9.** Compartiment selon la revendication 1, caractérisé en ce qu'il comprend un ressort d'ouverture (25) adapté pour faire pivoter angulairement le pivot (11) qui constitue l'axe de rotation dudit compartiment (1). 15
- 10.** Compartiment selon la revendication 9, caractérisé en ce que ledit pivot (11) forme un secteur denté (22) qui engrène avec un pignon (23) qui est monté avec friction, une extrémité dudit ressort d'ouverture (25) du compartiment (1) étant accouplée rigidement à une extrémité dudit secteur denté (22), ledit ressort (25) étant accouplé rigidement dans une position réglable à son autre extrémité. 20 25
- 11.** Compartiment selon la revendication 1, caractérisé en ce que ledit secteur de cercle s'étend sensiblement sur un quart de circonférence. 30

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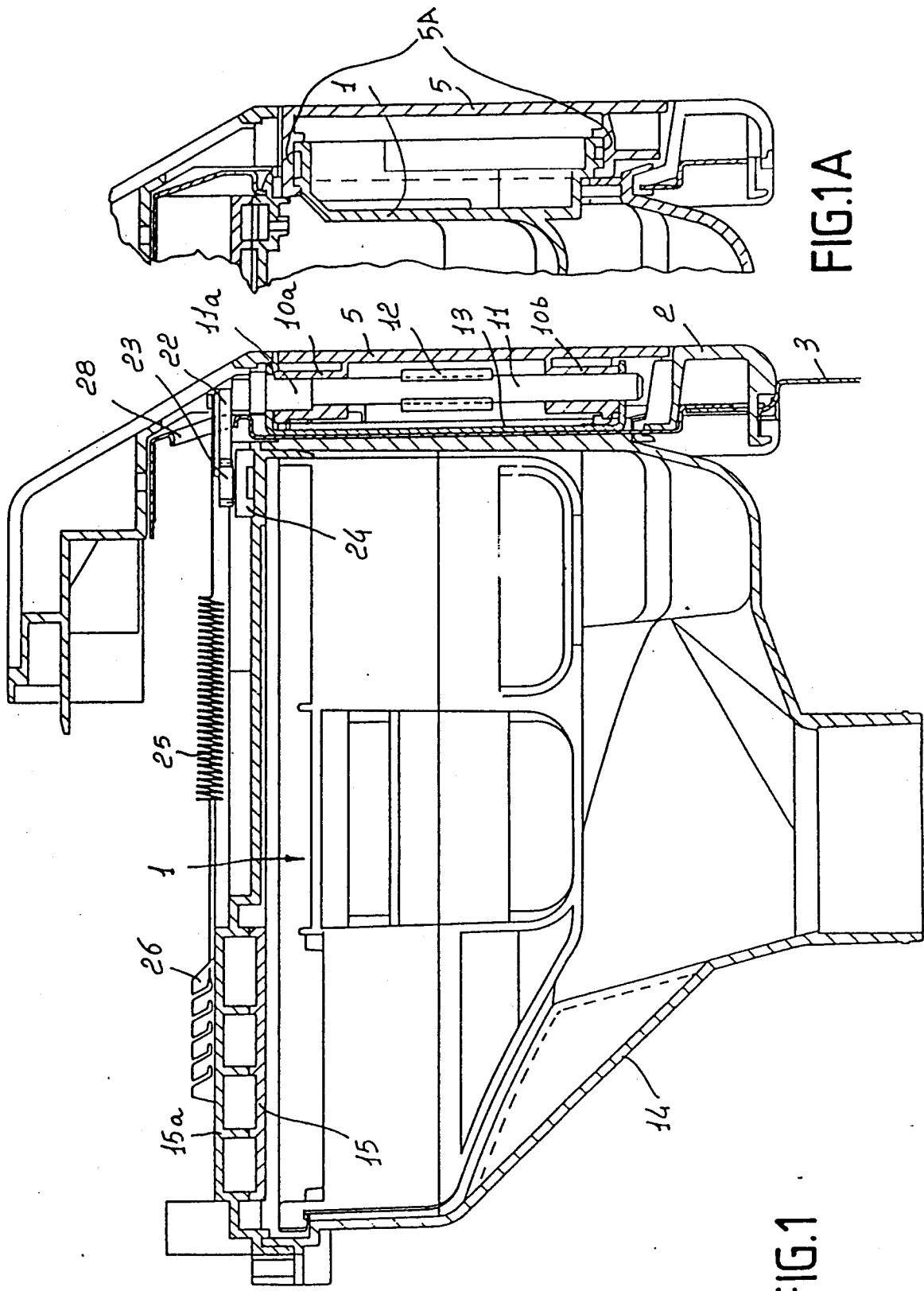


FIG.1

FIG.1A

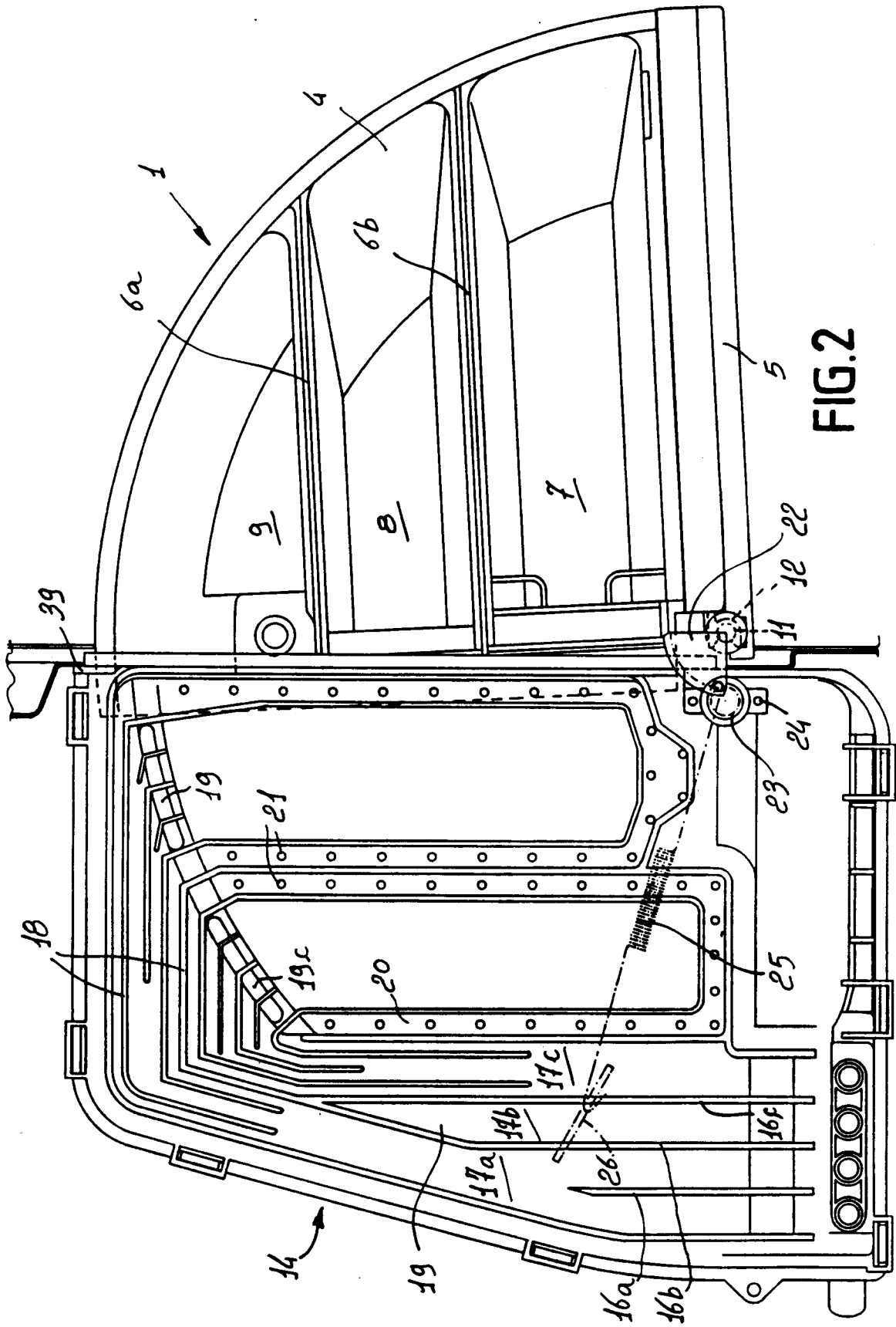


FIG.2

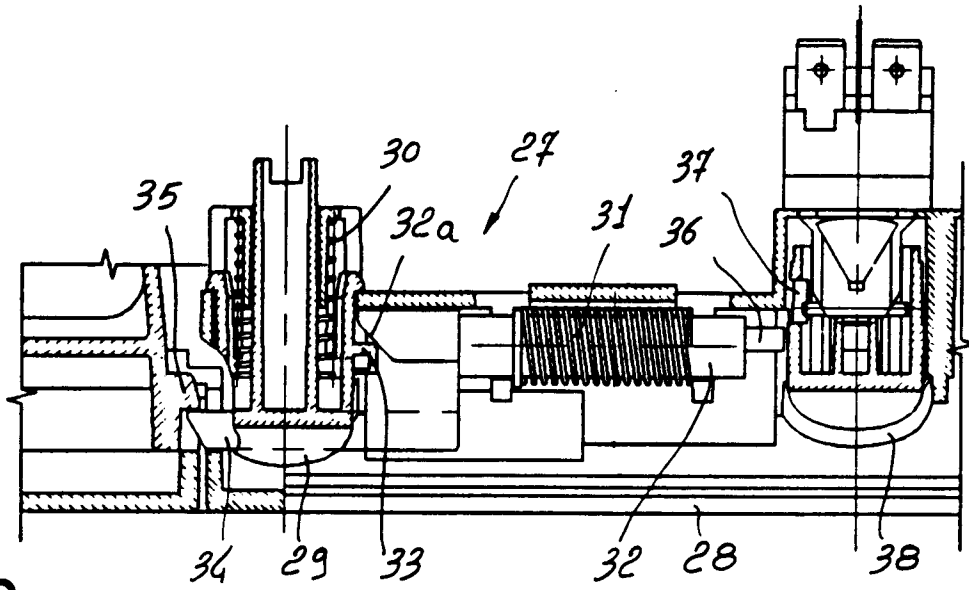


FIG. 3

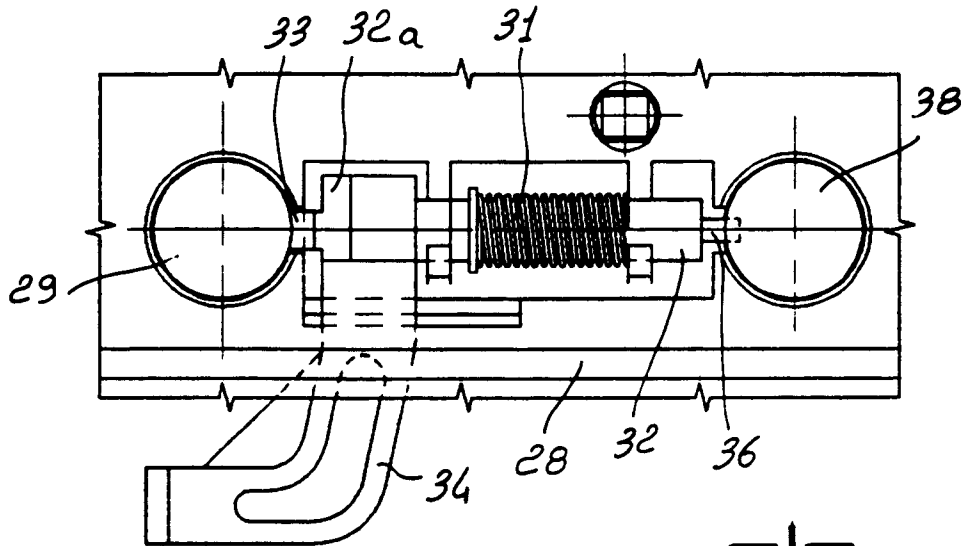


FIG. 4

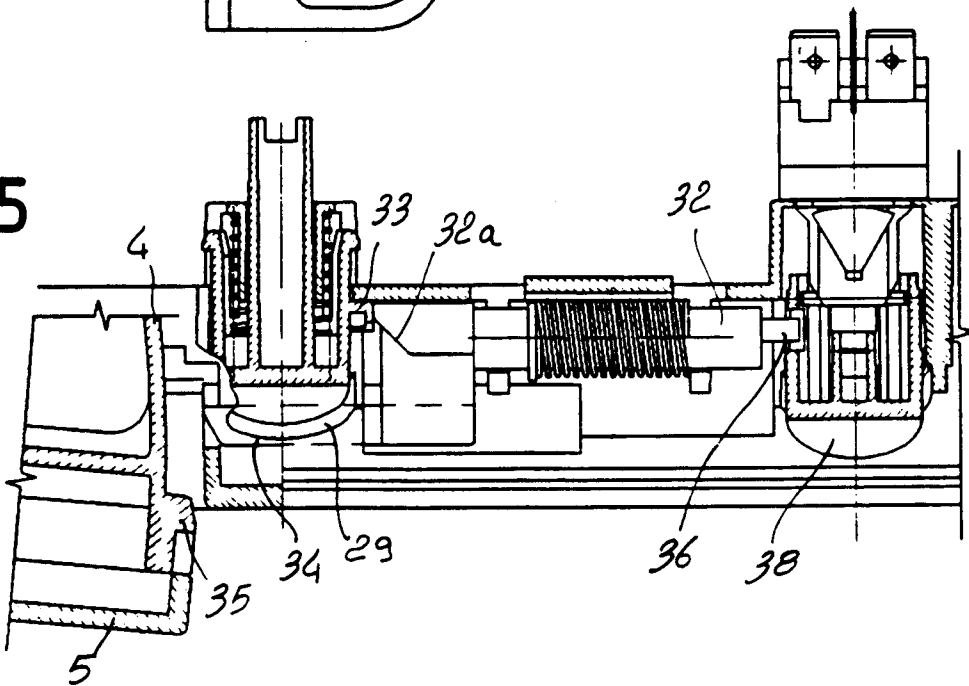


FIG. 5