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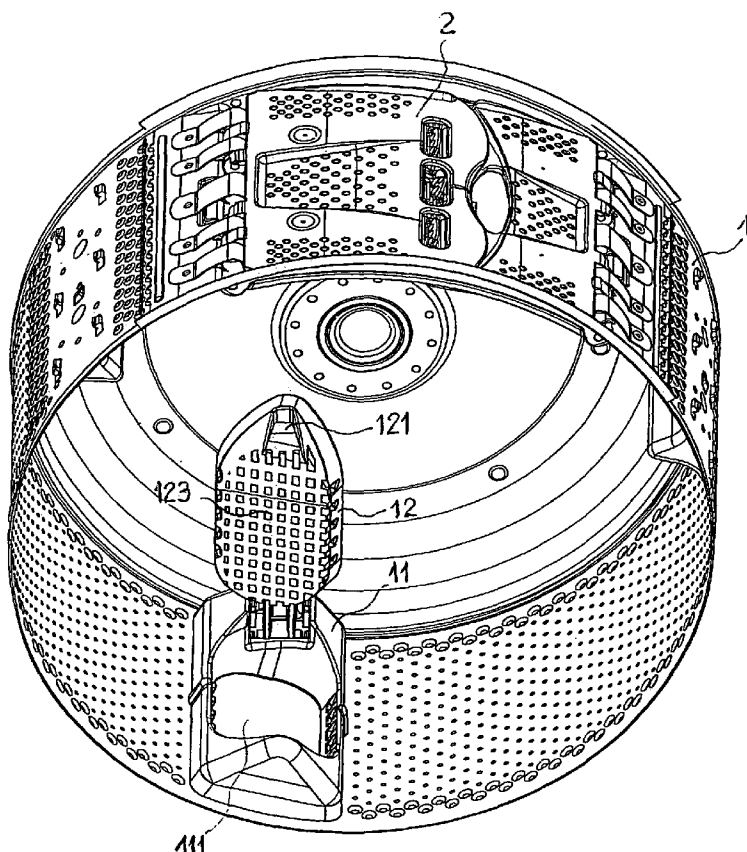
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(54) Title: SELF-CLOSING DRAINING FILTER ACCESS APPARATUS FOR A TOP-LOADING WASHING MACHINE



(57) Abstract: The invention concerns a self-closing of the draining filter access apparatus (10) integrated in the lifter diametrically opposite to the drum (1) access door (2), comprised of a body (11), including an opening (111) aligned with an opening of the same shape and dimensions made in the body of the drum (1), and a lid (12) articulated towards the body (11), locking on the body (11) by a simple ratchet mechanism. The articulation axis of the lid (12) is inclined towards the back by an alpha angle corresponding approximately to the angle of rotation to communicate to the drum (1) to bring the opening (111) of the body (11) of the apparatus (10) even with the filter basket put on the drain well of the machine tub, in order to obtain the self-closing of the apparatus (10) when the drum (1) returns in the loading position.



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Description

SELF-CLOSING DRAINING FILTER ACCESS APPARATUS FOR A TOP-LOADING WASHING MACHINE

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The invention concerns a self-closing of the draining filter access apparatus for a top-loading rotating drum washing machine.

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It is known to have, on the washing machine water outlet circuit irrespective of its loading method, between the bottom of the tub and the drain pump, a filtering means to retain all undesirable elements likely to damage or block the pump, which manage to pass through the holes located on the periphery of the drum, so as to allow the wash or rinse water to flow freely, or that would have been negligently introduced into the tub with the wash items when loading the drum and that would fall to the bottom of the tub by passing between the drum and the tub.

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The most common of these filtering means consists of a cylindrical box laid out along the axis of the drain pump, which is attached to the base of the machine. This box with the filter, connected to the draining well by piping, is accessible through a quick-remove plug that allows the filter to be removed and cleaned, the said plug being hidden by a gate located, depending on the case, on the front or back of the machine frame.

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On some machines, the drain pump is attached to the tub in the extension of a draining well where the protection filter is placed. However, contrary to the assembly mentioned above, in order to remove and clean the filter, this assembly requires access through the inside of the drum after placing it in the loading position, so an arm can be penetrated inside. A lifter for the washing drivetrain and the gate mass compensation is then diametrically opposite to the drum access opening, virtually plumb with the basket where the filter is mounted. Therefore, it was deemed practical to arrange the access grid to the strainer under a lifter attachment surface, which is hollowed out and consequently open at its ends. But it is understood that to access the access grid to the strainer in order to dismantle and clean the filter, the lifter that hides it has to be removed first, which requires removing the screws that connect the said lifter to the

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drum and removing it from the drum, at the risk of forgetting to reinstall it or fastening it improperly, with the risks that this presents in case the machine is reused in these conditions, especially during the spin drying cycle. Moreover, this dismantling and reassembling operation constitutes a difficult operation for the housewife who uses the machine, who most often does not have suitable tools, hence there is a serious risk of defective reassembly.

To find a solution for these disadvantages, provision was made to incorporate in the lifter on the machine drum, diametrically opposite the drum access door, an access apparatus to the machine tub comprised primarily of a body, constituting the base of the lifter, with an opening designed to coincide with an opening of the same shape and dimensions previously made in the cylindrical wall of the drum, which overlaps the filter basket at a determined position of the drum. The opening in the body of the apparatus is normally closed by a lid, thereby reconstituting the normal shape of a lifter, articulated towards one of the sides of the body and including at its end a means of locking by ratchet, which the user can deactivate with one of his fingers. The mass of the assembly corresponds to the normal mass required for this lifter, located opposite the access door to the drum and helping maintain the drum static and dynamic balance. Since the opening made in the apparatus body reduces its mass, the lid must provide the additional mass required to maintain the aforementioned balancing. In addition, the stop when the lid is fully open must be determined so that the said lid remains in this position throughout the entire filter cleaning operation that, thanks to a removable filter basket, can be done outside the machine. This is all the more so in view of its mass, since an untimely fall of the lid would cause the lid to immediately self-lock in the body.

However, even though this tub access apparatus presents, compared to the prior state of the art, the advantage of not requiring any dismantling and reassembly and does not require the use of any tools, there is nonetheless a risk of forgetting to re-close the lid, with the inherent risks of incidents if the drum is filled then put into operation for a complete wash cycle including a high-speed spin drying operation.

The purpose of the present invention is to provide a solution for this disadvantage. This invention, as characterized in the claims, resolves the problem involving creating an

apparatus that allows, on one hand, the apparatus lid to self-close under its own weight as soon as the drum is brought into the normal load position and, on the other hand, to indicate to the operator, by its verticality, the position of the drum corresponding to the super position of the filter basket by opening the access apparatus body.

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The advantages obtained through this invention consist primarily in that it facilitates access to the machine filter basket as well as its dismantling and removal for cleaning outside the machine, then its reassembly, without having to worry about re-closing the access apparatus since simply returning to the load position is sufficient to get it to self-

10 close.

Other characteristics and advantages will appear in the following description of a method of making the apparatus according to the invention, given as a non-limiting example with regard to the appended drawings where:

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- figure 1 shows a front view of the closed apparatus,
- figure 2 shows a right side view of the closed apparatus,
- figure 3 shows a top view of the closed apparatus,
- figure 4 shows a front view of the apparatus in an open position,
- 20 - figure 5 shows a below view of the apparatus in an open position,
- figure 6 shows a back view of the apparatus in an open position,
- figure 7 shows a front longitudinal section view of a drum equipped with the apparatus in an open position,
- figure 8 shows a right side cross section view according to plan P1 of the drum
- 25 according to figure 7,
- figure 9 shows a left side perspective section view according to plan P2 of the drum according to figure 7.

The figures represent a draining filter access apparatus on a top-loading washing machine, integrated in one of the lifters equipping the washing machine drum **1**, diametrically opposite to the drum **1** access door **2**; the said apparatus **10** including a body **11** equipped with an opening **111** normally closed by a lid **12** reproducing the exterior shape of a drum lifter, interlocked to the body **11** by two studs **124** aligned

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according to an axis XX' inclined towards the back according to an alpha angle of approximately 15° towards the base of the body 11 of the apparatus 10, the lid 12 closing and normally stopping with a ratchet mechanism by its own weight, when the apparatus 10 is located plumb with the access door 2 to the drum, when it is in the
5 loading position. This ratchet is obtained via a flexible locking hook 14, interdependent with the body 11, located at the end of the opening 111 opposite to the articulation of the lid 12, whose beak 141 ratchets on the lower edge of a small window 121, forming a stop catch, made in the wall of a cavity 122 created in the free end of the lid 12 and open on the top to allow the said lid 12 to be released by removing the beak 141 of the
10 flexible hook 14 under the action of a finger, accompanied by an action with the hand intended to bring the lid 12 to the opening stop corresponding more or less to its vertical position.

The opening 111 of the body 11 is lined at its base by a collar 112 intended to be fitted
15 into a passageway of a corresponding shape and dimensions made in the drum 1, against the wall of which the apparatus 10 is attached by four screws entering the openings 101 to 104 provided for this purpose in the base of the body 11 as it is the case for the other lifters. Subject to a certain beta angular discrepancy of approximately 15° of the drum 1 towards its normal resting position, towards the back of the machine,
20 the opening 111 of the access apparatus 10 lines up with the sump of the draining well, where a basket containing the filter one wants to clean is placed. Therefore, one just has to remove this basket by passing it through the opening 111 of the access apparatus 10 that, in this position of the drum 1, provides balancing for the lid 12 in the vertical position, given the alpha incline of approximately 15°, which was provided
25 during construction to its XX' articulation axis; this balancing is broken spontaneously as soon as the drum 1 returns to the filling position as soon as the filter cleaning operation is over and the access door 2 to the inside of the drum 1 has been realigned with the access door to the tub.

30 In examining now, in more detail, figures 1 to 9, one notices: on figures 1 and 3, the access cavity 122 to the beak 141 of the locking hook 14 engaged on the edge of the small window 121, showing on figures 3, 8 and 9 and, on figure 2, the incline of approximately 15° given to the XX' articulation axis of the lid 12, so the lid remains in

vertical balancing for a beta angular discrepancy corresponding to the drum **1**, in order to facilitate access to the draining well to remove and reinstall the filter basket, as illustrated in figures 7 to 9.

- 5 One will also notice, by comparing figures 4 and 6, that a certain incline of approximately 15° , towards the top and back, has been given to the inside front **123** of the lid **12** to facilitate passing a hand, as well as removing and reinstalling the filter basket, which therefore can be done without tools and without any other operation other than releasing and opening the lid **12** of the body **11**, by simply pressing with one's
10 finger on the beak **141** of the locking hook **14** of the lid **12** accompanied by a slight tension from the hand to obtain the complete release of the opening **111** of the body **11** from the apparatus **10** by hinging of the said lid **12**.

- Therefore there is no risk in case one forgets to re-close the apparatus , since for one
15 rotation of the drum through an angle of approximately 15° in the normal spin drying direction, the lid **12** of the access apparatus **10** falls back on its seat by its own weight and this is the case when the user wants to reuse the machine whose tub and drum doors have to be aligned to load the machine.

Claims

1. Self-closing of the draining filter access apparatus for a top-loading rotating drum washing machine, integrated in one of the lifters of the machine drum (1), comprised
5 of a body (11), including an opening (111) aligned with an opening of the same shape and dimensions made in the body of the drum (1), and a lid (12) articulated towards the body (11), locking by a simple ratchet mechanism on the body (11), characterized in that the XX' articulation axis of the lid (12) is inclined towards the back by an alpha angle corresponding approximately to the angle of rotation to
10 communicate to the drum (1) to bring the opening (111) of the body (11) of the apparatus (10) even with the filter basket put on the drain well of the machine tub.
2. Apparatus according to claim 1, characterized in that the full open stop and shape of the lid (12) are determined such that the lid remains in the open vertical position
15 when the opening (111) of the body (11) of the access apparatus (10) is even with the filter basket put on the drain well of the machine tub.
3. Apparatus according to claim 1, characterized in that the alpha angle of incline of the XX' axis of the lid (12) towards the body (11) is approximately 15°.
- 20 4. Apparatus according to claim 1 or 2, characterized in that the balancing in the open position of the lid (12) when the said apparatus (10) is located even with the filter basket put on the drain well is determined such that the said lid (12) rocks under its own weight and closes when the rotation travel of the drum (1) corresponds to the
25 drum return to the loading position.

FIG.2

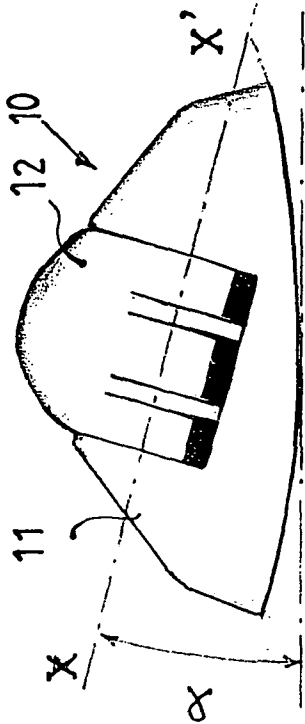


FIG.1

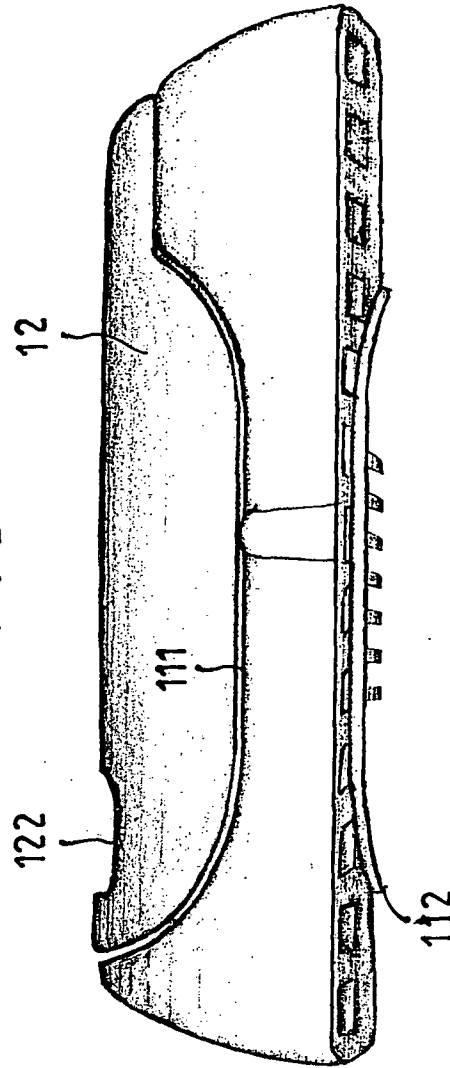
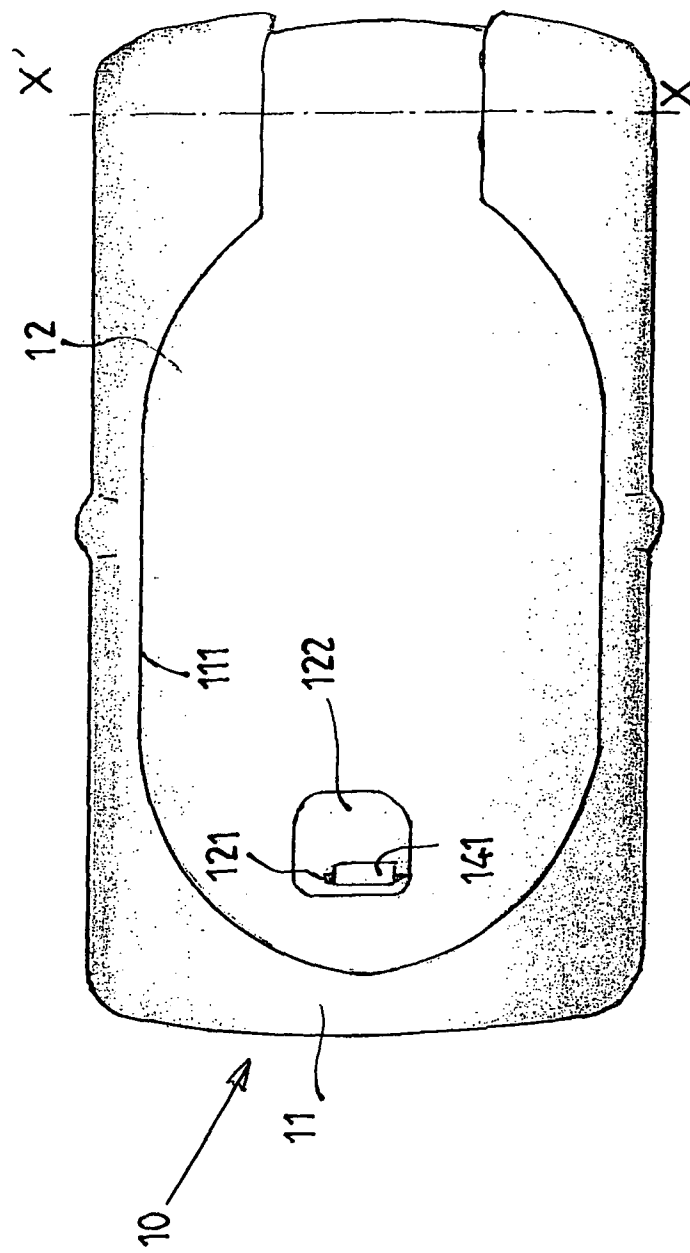


FIG.3



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FIG.4

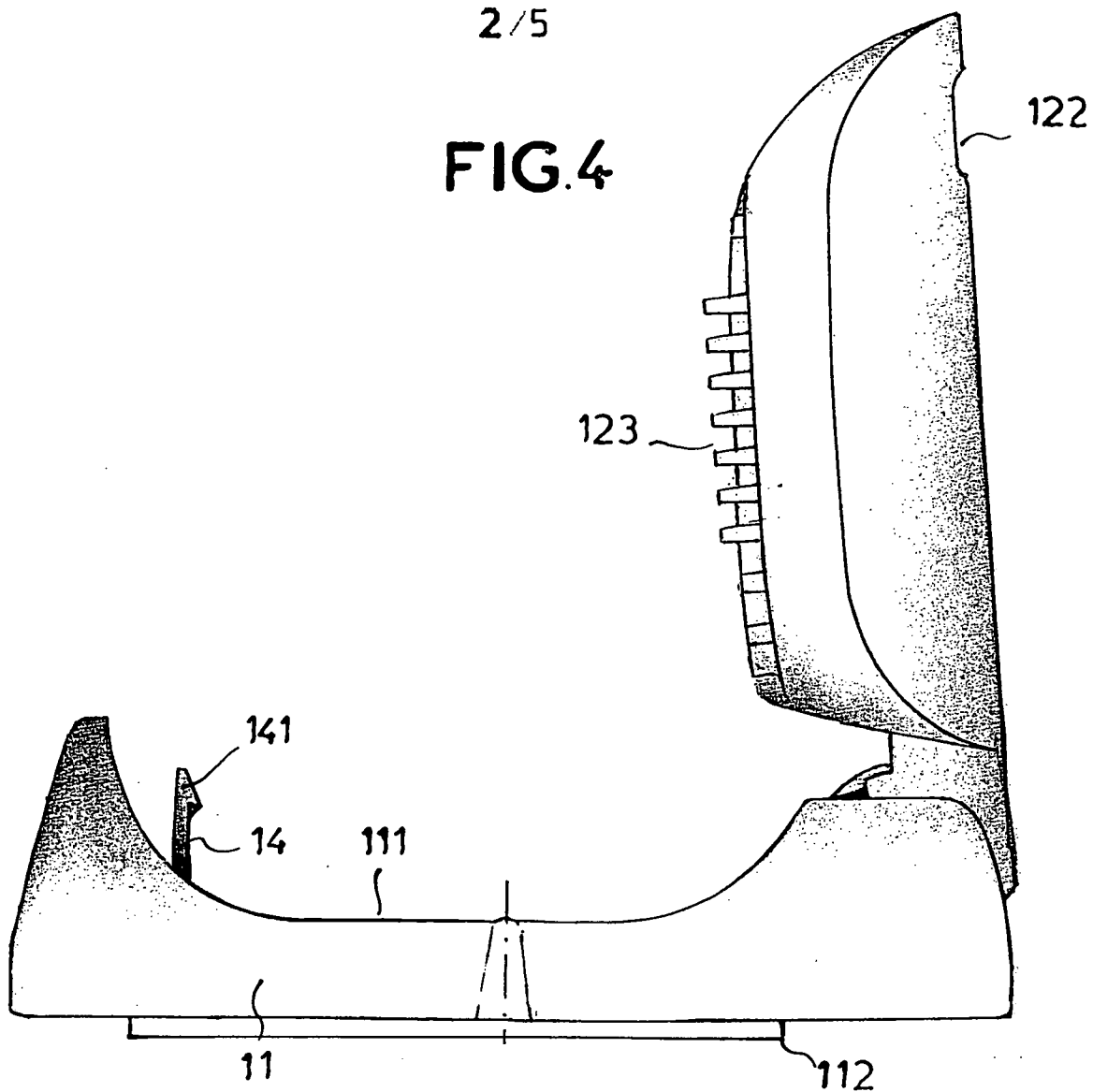
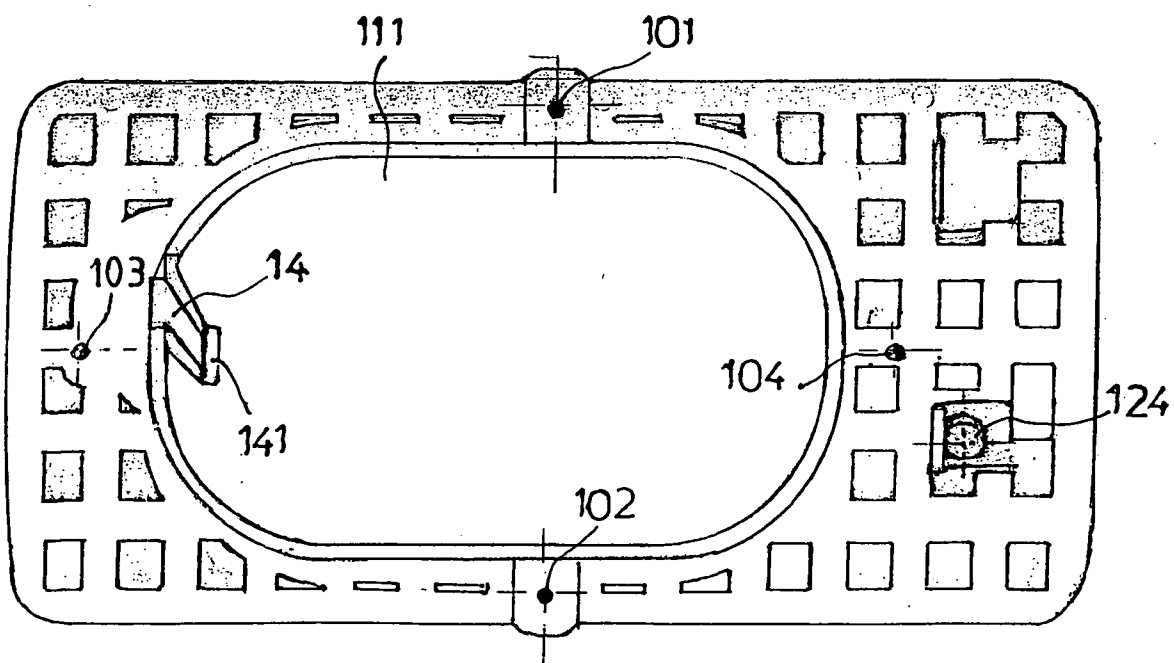


FIG.5



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FIG.6

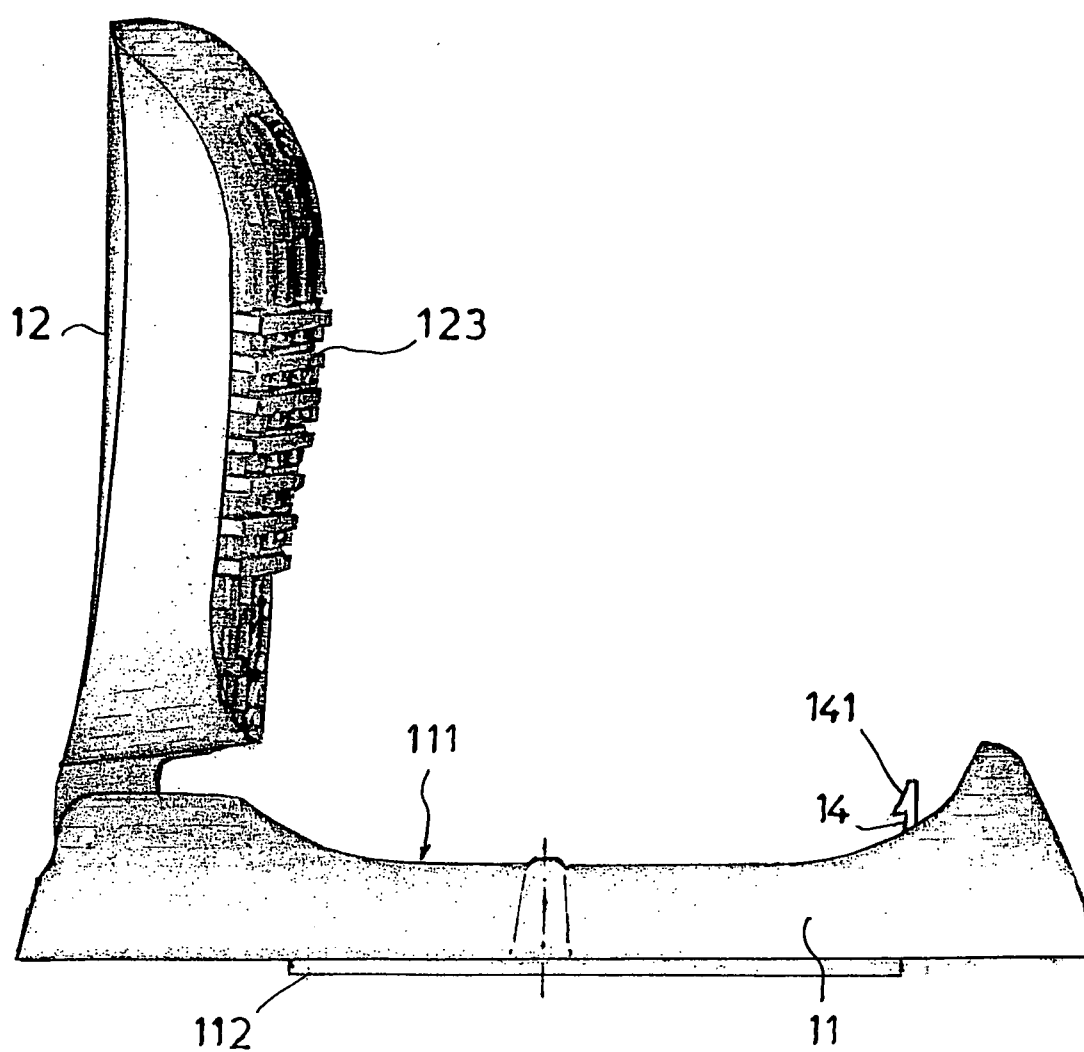


FIG.7

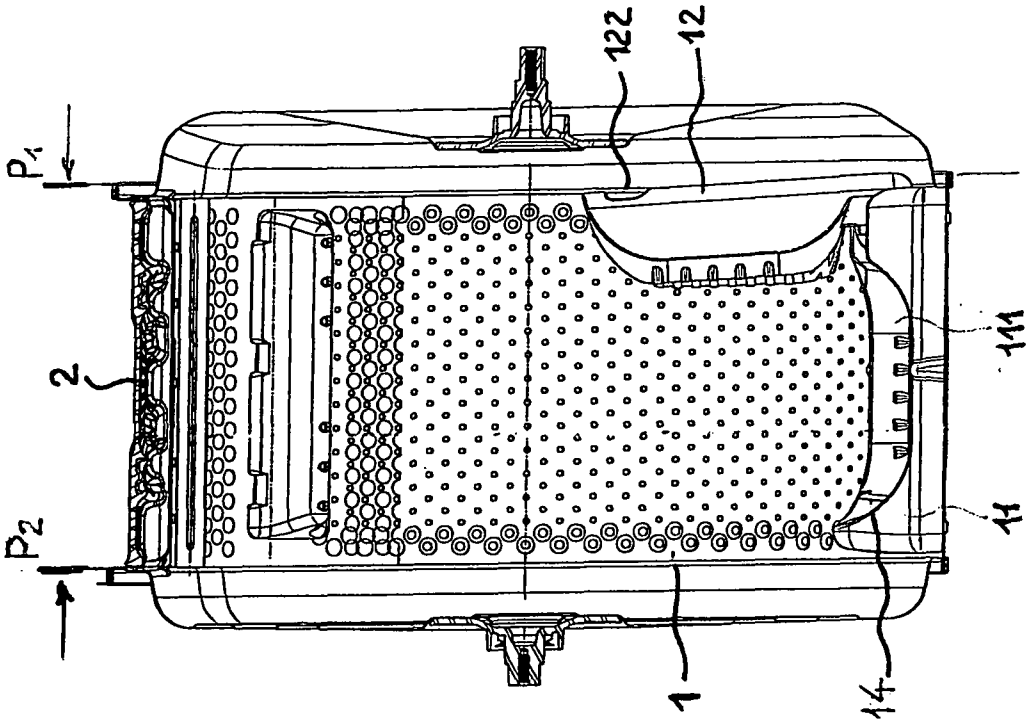
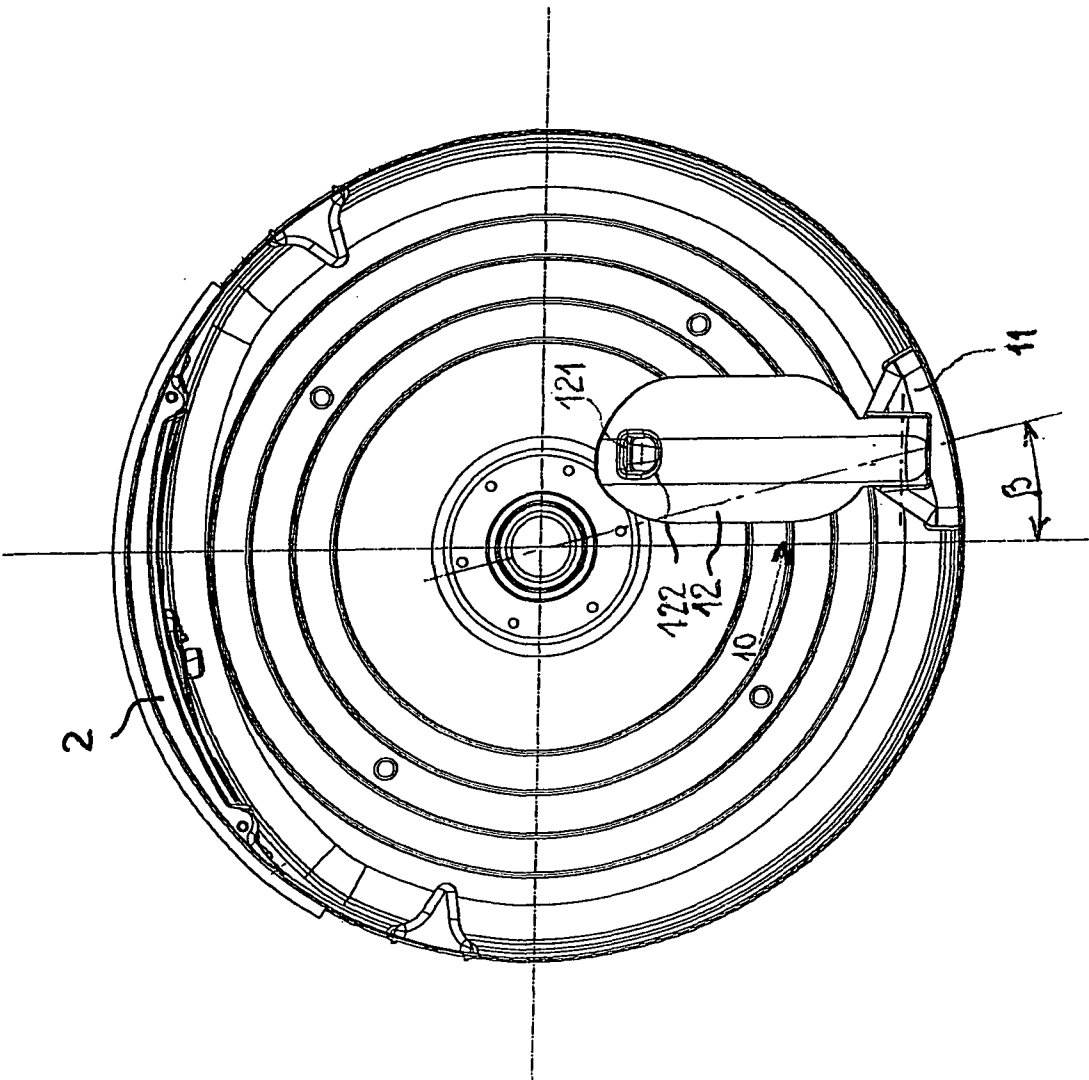
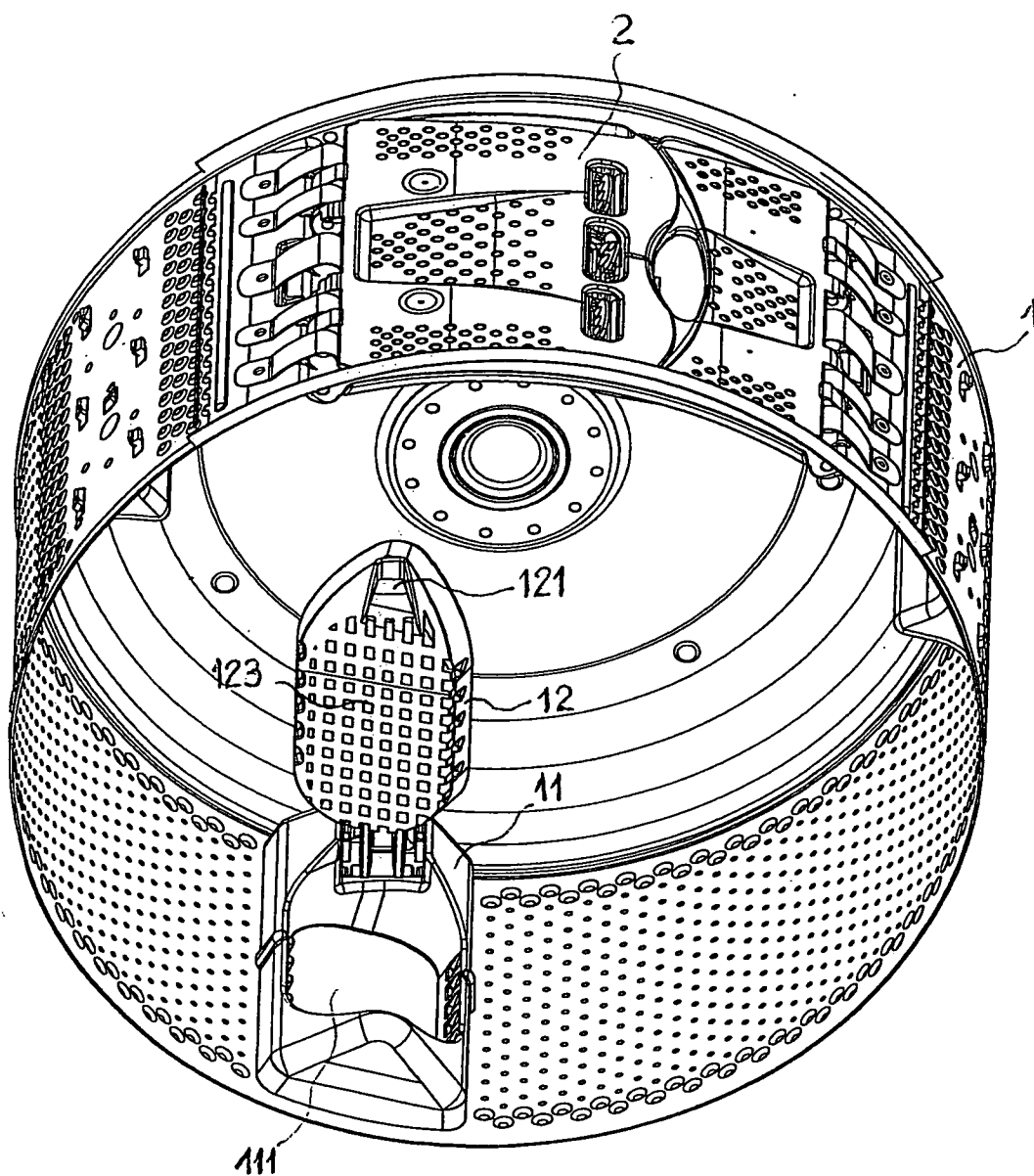


FIG.8



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FIG.9



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/001776

A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F37/06 D06F39/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	GB 1 197 919 A (CANDY SPA [IT]) 8 July 1970 (1970-07-08) the whole document -----	1
A	DE 71 06 208 U (SIEMENS GMBH) 3 August 1972 (1972-08-03) the whole document -----	1
A	JP 59 077893 A (MATSUSHITA ELECTRIC IND CO LTD) 4 May 1984 (1984-05-04) figures -----	1
A	US 3 022 654 A (ABERLE ROBERT C) 27 February 1962 (1962-02-27) column 3, line 32 - column 4, line 71; figures ----- -/--	1

☒ Further documents are listed in the continuation of Box C.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/001776

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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