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(54) **Self-closing draining filter access apparatus for a top-loading washing machine**

Selbstschliessende Ablassfilter-Zugriff-Vorrichtung für eine mantelbeschickbare Waschmaschine

Appareil d'accès au filtre de vidange à fermeture automatique pour une machine à laver à chargement par le haut

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Description

[0001] The invention concerns a self-closing of the draining filter access apparatus for top-loading washing machine having a drum rotatable on an horizontal axis.

[0002] 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.

[0003] 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.

[0004] On some machines (see, for example GB 1,197,919), 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 (see for example GB 725 123) 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 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.

[0005] 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 re-constituting 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. This solution described in the European application EP-A-1 849 910 having the same filing date of the present application.

[0006] 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.

[0007] 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.

[0008] 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-close.

[0009] Other characteristics and advantages will appear in the following description of the apparatus according to the invention, given as a non-limiting example with regard to the appended drawings where:

- 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,

- 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 according to figure 7,
- figure 9 shows a left side perspective section view according to plan P2 of the drum according to figure 7.

[0010] 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**, **125** aligned according to an axis XX' downwardly inclined towards the back of the machine in the down loading position to form an alpha angle α of approximately 15° relative to the base of the **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 plum with the access door **2** to the drum, when it is in the 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 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 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.

[0011] The opening **111** of the body **11** is lined at its base by a collar **112** intended to be fitted 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, 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 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.

[0012] 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.

[0013] One will also notice, by comparing figures 4 and 6, that a certain incline of approximately 15° , towards the top and back of the machine, has been given to the inside front **123** of the lid **12** relating to its articulation axis XX' to facilitate passing a hand, as well as removing and re-installing 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 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**.

[0014] Therefore there is no risk in case one forgets to re-close the apparatus, since for one 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. Top-loading washing machine having a drum (1) rotatable on an horizontal axis with an access door (2), a tub with an access door, a draining well with a filter basket and a draining filter access apparatus (10) integrated in one of the lifters of the drum (1), the rotatable drum (1) having a loading position in which its access door (2) is aligned with the tub access door, said draining filter access apparatus (10) comprising a body (11) equipped with an opening (111) normally closed by a lid (12), characterized by said lid reproducing the exterior shape of a drum lifter and being lockable to the body via a simple ratchet mechanism, said lid (12) being interlocked to the body according to an articulation axis (XX') being downwardly inclined towards the back of the machine in the drum loading position to form an alpha angle (α) relative to the base of the body (11) of the apparatus (10), said alpha angle corresponding to a rotation beta angle (β), said beta angle being the angular

discrepancy of the drum (1) towards the back of the machine relative to its loading position required to align the opening (111) of the filter access apparatus (10) with the filter basket, the lid (12) of the filter access apparatus (10) thereby being balanced in its open vertical position when the opening of the filter access apparatus (10) is aligned with the filter basket, this balancing being broken spontaneously as soon as the drum returns to its loading position making the lid thereby self-close under its own weight.

2. Apparatus according to claim 1, wherein said alpha angle is approximately 15°.
3. Apparatus according to claim 1, **characterized in that** the inside front (123) of the lid (12) is inclined of approximately 15° towards the top and back of the machine relating to its articulation axis (XX').

Patentansprüche

1. Topladerwaschmaschine mit einer um eine horizontale Achse rotierbaren Trommel (1), mit einer Zugriffstür, einer Wanne mit einer Zugriffstür, einer Ablassöffnung mit einem Filterkorb und einer Ablassfilterzugangsvorrichtung (10), welche in einer der Trommelnocken integriert ist, einer rotierbaren Trommel (1) mit einer Ladeposition, in welcher die Zugriffstür (2) zu der Wannenzugriffstür ausgerichtet ist, wobei die Ablassfilterzugangsvorrichtung (10) einen Körper (11) aufweist, welcher mit einer Öffnung (111) versehen ist, die gewöhnlich mit einer Klappe (12) geschlossen ist, **dadurch gekennzeichnet, dass** diese Klappe die äußere Gestalt eines Trommelnockens wiedergibt und durch ein einfaches Klinkwerk an dem Körper verschließbar ist, die Klappe (12) mit dem Körper englang einer Gelenkachse (XX') verriegelt ist, welche abwärts zu der Unterseite der Maschine in der Trommelbeladungsposition geneigt ist und einen Winkel alpha (α) relativ zu der Basis des Körpers (11) der Vorrichtung (10) formt, wobei der Winkel alpha mit einem Rotationswinkel beta (β) korrespondiert und der Winkel beta die Winkelverschiebung der Trommel (1) zu der Unterseite der Maschine relativ zu ihrer Ladeposition darstellt, die zur Ausrichtung der Öffnung (111) der Filterzugangsvorrichtung (10) zu dem Filterkorb benötigt wird, wobei die Klappe (12) der Filterzugangsvorrichtung (10) in ihrer offenen vertikalen Position ausbalanciert ist, wenn die Öffnung der Filterzugangsvorrichtung (10) zu dem Filterkorb ausgerichtet ist und diese Ausbalancierung umgehend gelöst wird, sobald die Trommel in ihre Ladeposition zurückkehrt und **dadurch** die Klappe aufgrund ihres Eigengewichts selbstschließend wird.

2. Vorrichtung nach Anspruch 1, worin der Winkel α ungefähr 15° beträgt.
3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Innenseite (123) der Klappe (12) um ungefähr 15° gegenüber der Ober- und Unterseite der Maschine gemäß ihrer Gelenkachse (XX') gekippt ist.

Revendications

1. Machine à laver a chargement par le dessus comprenant un tambour (1) tournant sur un axe horizontal avec une porte d'accès (2), une porte d'accès à la cuve, un puisard de vidange avec un panier porte filtre (10) et un dispositif d'accès au filtre de vidange (10) intégré dans l'un des redans du tambour (1), le tambour tournant (1) ayant une position de chargement dans laquelle sa porte d'accès (2) est alignée avec la porte d'accès à la cuve, ledit dispositif d'accès au filtre de vidange (10) comprenant un corps (11) pourvu d'une ouverture (111) normalement fermée par un couvercle (12), **caractérisée en ce que** ledit couvercle (12), reproduisant la forme extérieure d'un redan de tambour, est verrouillable sur le corps par simple encliquetage et est relié au corps selon un axe d'articulation (XX') incliné vers le bas et vers l'arrière de la machine dans la position de chargement du tambour pour former un angle (α) par rapport à la base du corps (11) du dispositif (10), ledit angle alpha correspondant audit angle bêta de rotation (β), ledit angle bêta correspondant à l'écart angulaire du tambour (1) vers l'arrière de la machine par rapport à sa position de chargement, requise pour aligner l'ouverture (111) du dispositif d'accès au filtre (10) avec le panier porte filtre, le couvercle (12) du dispositif d'accès au filtre (10), par ce moyen étant équilibré dans sa position d'ouverture verticale quand l'ouverture du dispositif d'accès au filtre (10) est alignée avec le panier porte filtre, son équilibre étant interrompu spontanément dès que le tambour retourne à sa position de chargement faisant que ledit couvercle, se referme de lui-même, par ce moyen, sous son propre poids.
2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit angle alpha est d'environ 15°.
3. Dispositif selon la revendication 1, **caractérisé en ce que** la face intérieure (123) du couvercle (12) est inclinée d'environ 15° vers le dessus et l'arrière de la machine par rapport à son axe d'articulation (XX').

FIG.2

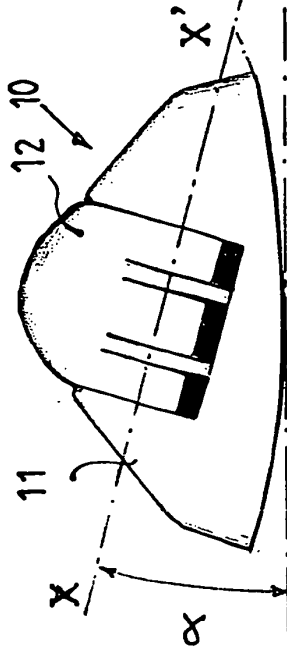


FIG.1

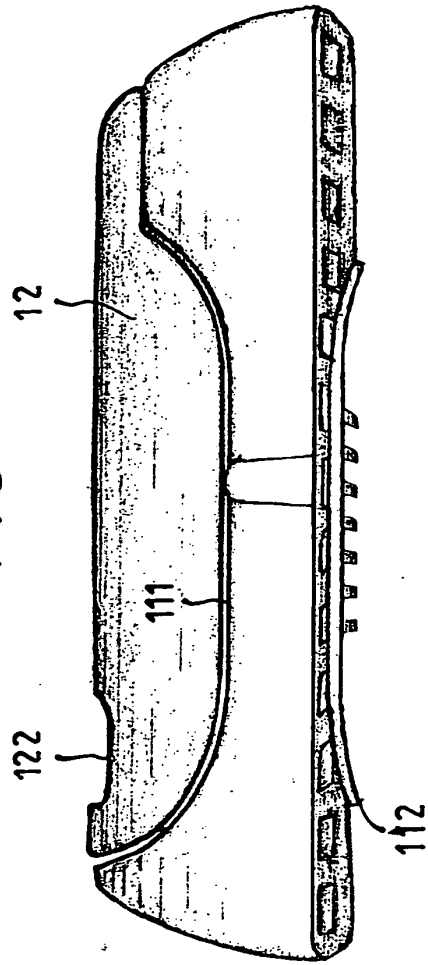


FIG.3

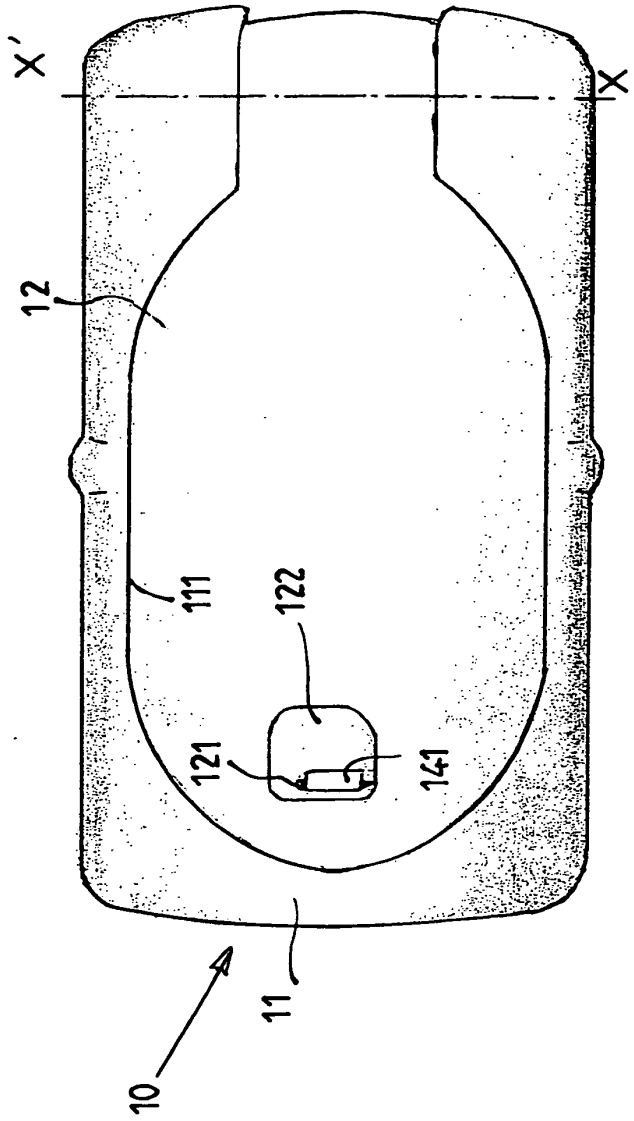


FIG.4

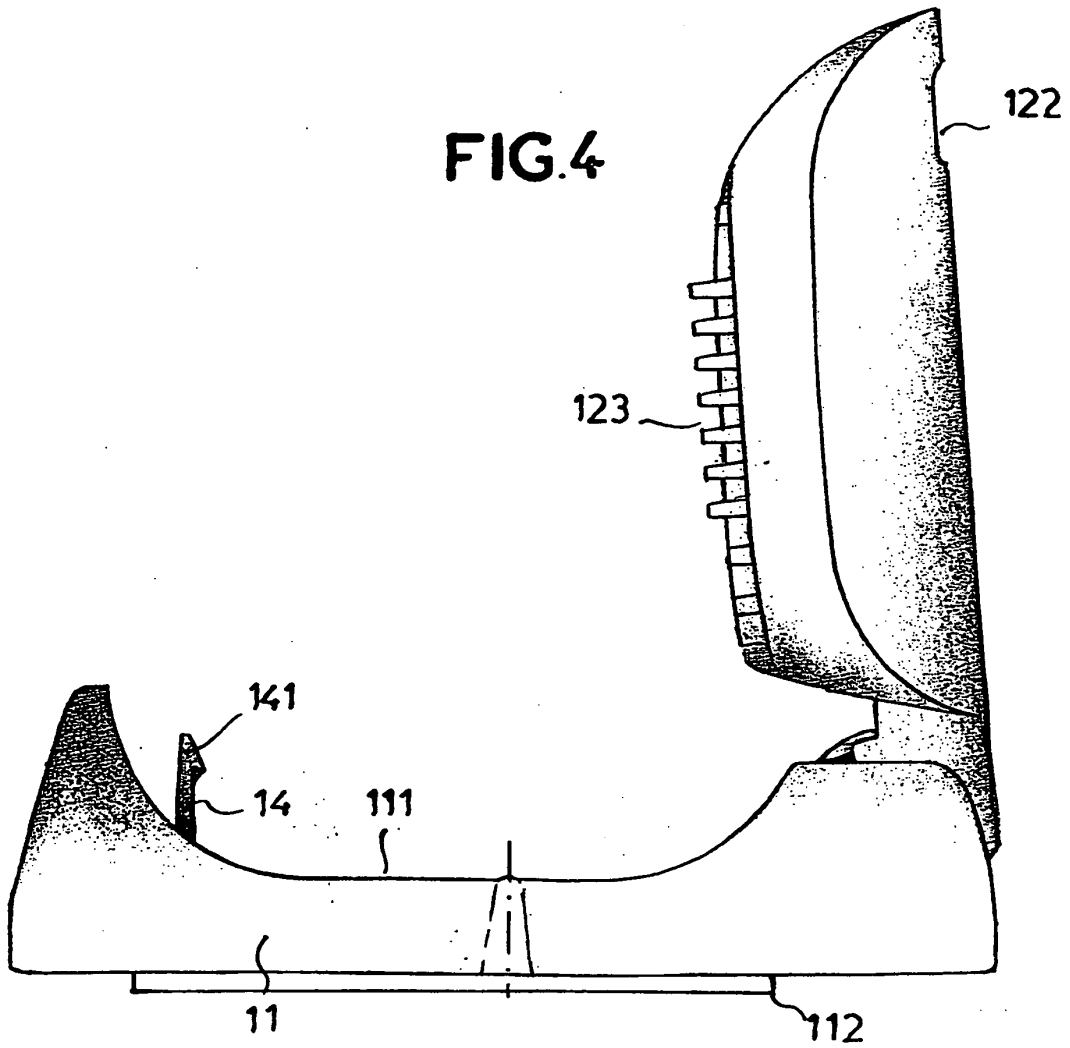


FIG.5

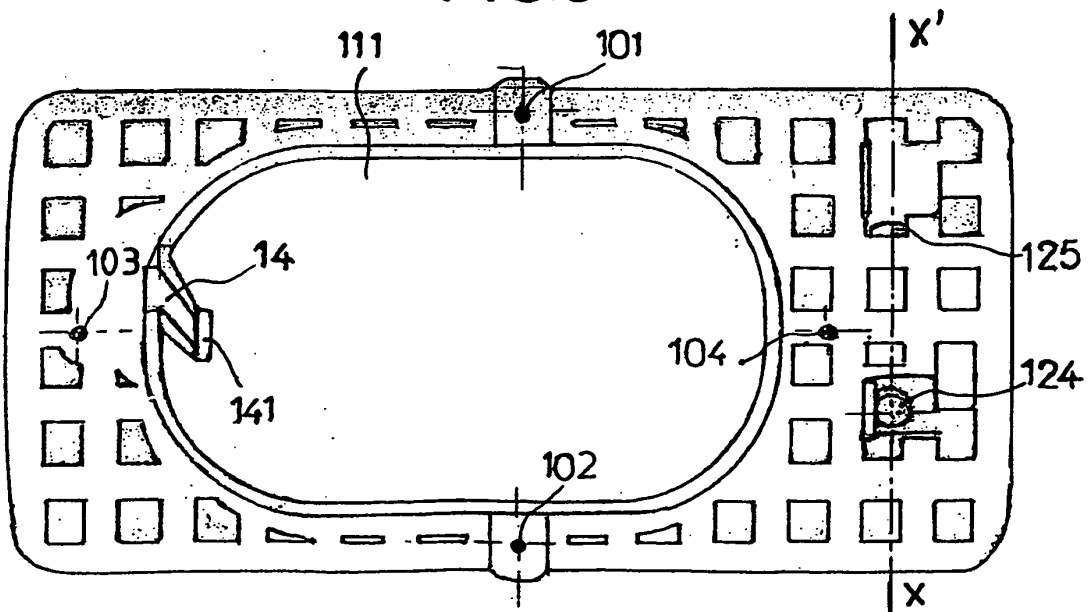


FIG.6

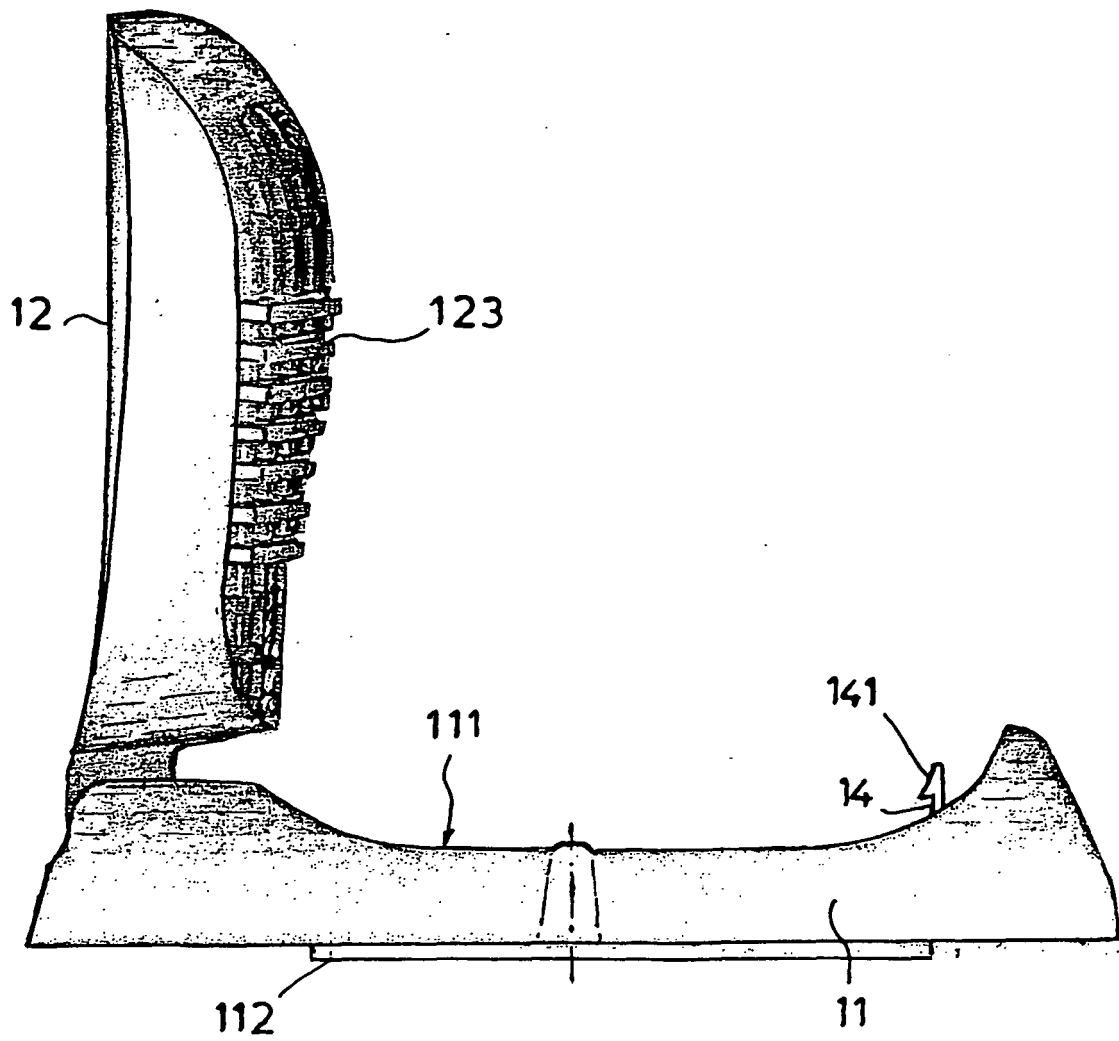


FIG.7

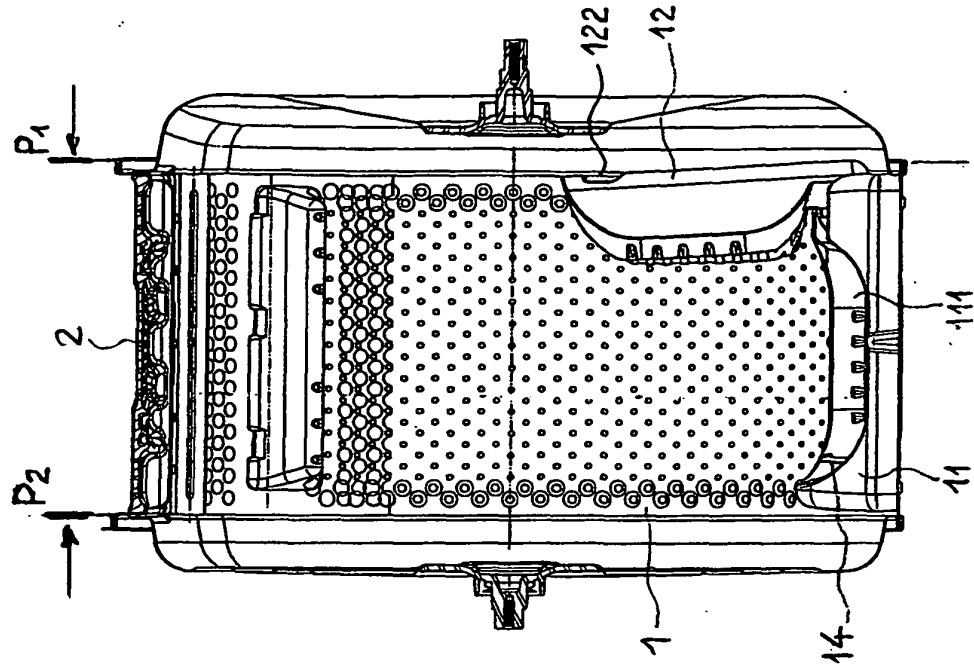


FIG.8

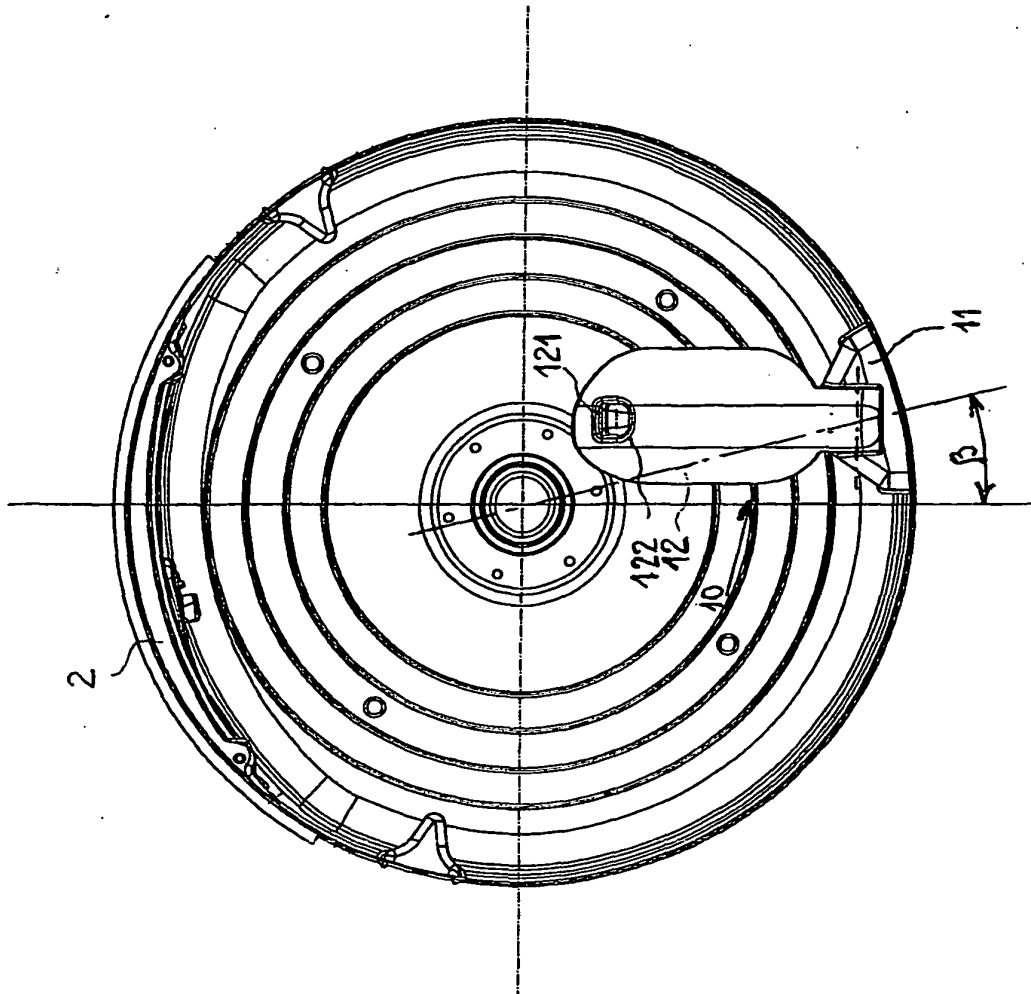
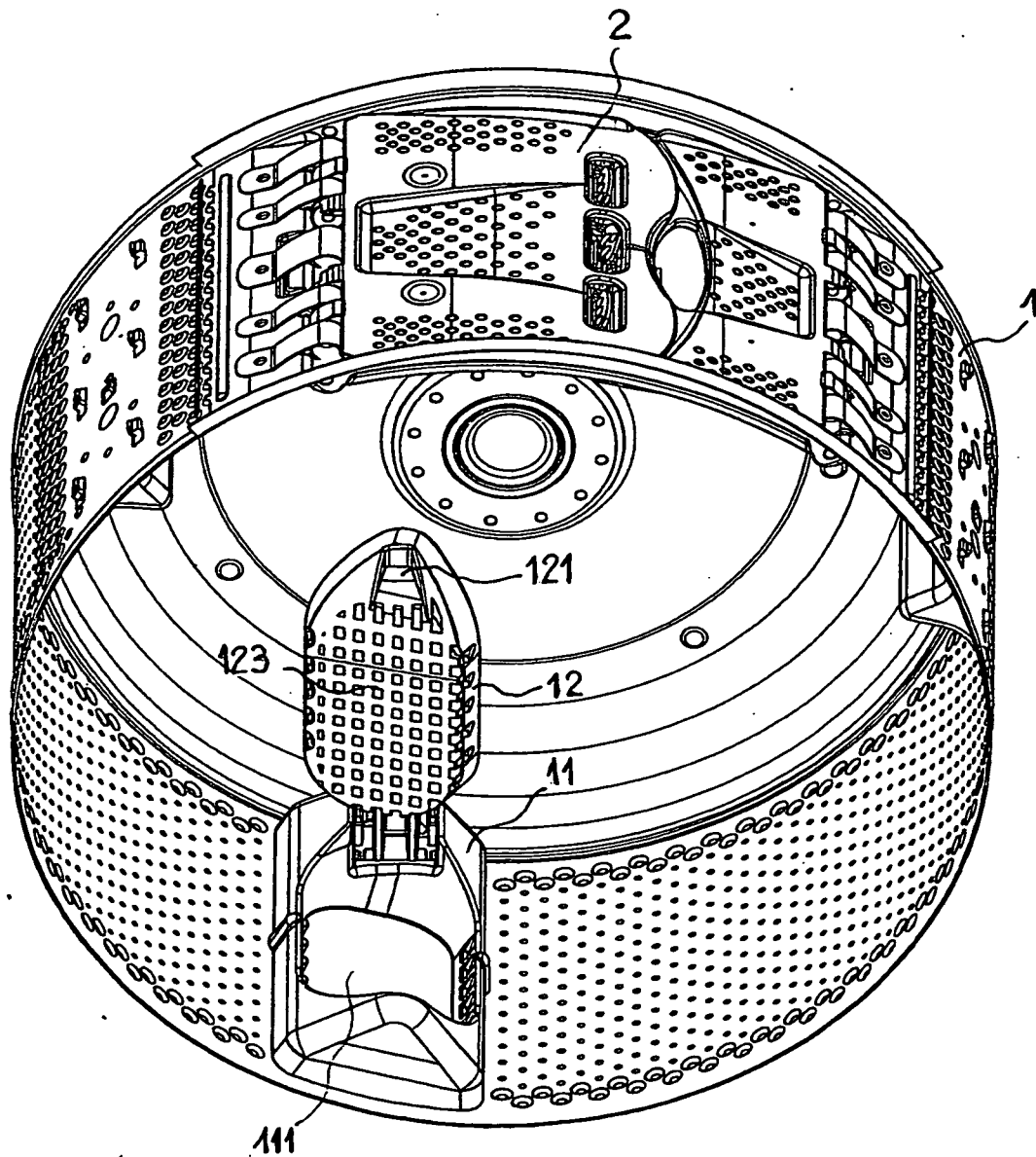


FIG.9



REFERENCES CITED IN THE DESCRIPTION

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