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(54) WASHING APPLIANCE COMPRISING A DRUM

WASCHMASCHINE MIT EINER TROMMEL
LAVE-LINGE AVEC UN TAMBOUR

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DescriptionTechnical Field

[0001] This invention relates to a washing appliance and to a method for making it.

Prior Art

[0002] Known in the prior art are laundry washing machines comprising a drum and a drive motor connected to the drum by a tripod joint. A tripod joint is a structure with three arms extending from a central body which is connected to the rotational drive shaft. The three arms are connected by threaded connections to the rear flank of the drum in order to transmit drive from the shaft to the drum.

[0003] Documents US 2008/110212 A1 (disclosing the preamble of claim 1), EP 0 810 317 A1 and EP 2 083 109 A1 disclose laundry washing machines whose drums are provided with dynamic balancers comprising balls.

Disclosure of the Invention

[0004] In this context, the aim of this invention is to provide a washing appliance that is simpler in construction.

[0005] Another aim of the invention is to simplify washing appliance assembly.

[0006] A further aim of this invention is to propose a washing appliance which allows the functions of the individual components to be optimized.

[0007] The technical purpose and aims specified are substantially achieved by a washing appliance comprising the technical features set out in one or more of the accompanying claims.

Brief Description of the Drawings

[0008] Further features and advantages of the invention are more apparent in the non-limiting description which follows of a preferred non-exclusive embodiment of a washing appliance illustrated in the accompanying drawings, in which:

- Figure 1 is a front view of a drum for a washing appliance according to this invention;
- Figures 2 and 3 are, respectively, a front and a rear perspective view of a drum for a washing appliance according to this invention;
- Figure 4 shows a cross section through the plane A-A of Figure 1;
- Figure 5 shows the detail "C" from Figure 4;
- Figure 6 shows a washing appliance according to this invention.

Detailed Description of the Preferred Embodiments of the Invention

[0009] With reference to the accompanying drawings, the numeral 1 denotes a washing appliance comprising a drum 2 which forms a washing compartment 20.

[0010] The washing appliance 1 is a laundry washing machine.

[0011] The drum 2 can rotate about an axis of rotation 21. Rotation improves washing efficiency by moving the articles to be washed and also allows them to be spin dried. The drum 2 comprises an opening 22 for loading and extracting the articles to be washed. In front-loading laundry washing machines, the opening 22 faces an external door 23, while in top-loading laundry washing machines the opening 22 can normally be closed by a door built into the drum 2.

[0012] The washing appliance 1 comprises a shaft 3 for rotationally driving the drum 2 and extending along the axis 21 of rotation. The rotational drive shaft 3 allows transfer to the drum 2 of the rotational motion imparted by an electric motor (not illustrated) forming part of the washing appliance 1.

[0013] The drum 2 also comprises a flank 4 which extends transversally to the rotational drive shaft 3 and which partly delimits the washing compartment 20 of the drum 2.

[0014] The flank 4 comprises a hole 5 coaxial with the axis 21 of rotation in which the rotational drive shaft 3 of the drum 2 is inserted. Advantageously, the rotational drive shaft 3 is irremovably embedded in the coaxial hole 5 (in which case, the rotational drive shaft 3 can be considered as being integrated into the drum 2). Conveniently, at the interface between the shaft 3 and the flank 4, every point on the flank 4 adheres stably and irremovably to the shaft 3. That means there is no need for a tripod joint to connect the rotational drive shaft to the drum.

[0015] Advantageously, the flank 4 and the rotational drive shaft 3 are obtained by overmoulding the flank 4 over the shaft 3.

[0016] As illustrated by way of an example in Figure 4, the flank 4 comprises a first wall 41 and a second wall 42 alongside each other. The first and the second walls 41, 42 are irremovably connected.

[0017] In the preferred embodiment, the first and second walls 41, 42 are made at least partly of a material having a plastic matrix. More specifically, the first wall 41 is at least partly (or substantially) made of a plastic material charged with calcium. In particular, the material must be such as not to damage the laundry by friction. The second wall 42 is at least partly (or substantially) made of a plastic material charged with fibre glass. The mechanical and stress resistance properties of this material are greater than those of the material used to make the first wall 41. The use of plastic materials makes it possible to limit the rotating mass, with advantages in terms of reduced vibrations. Further, as explained better

below, the use of plastic material facilitates assembly to the rest of the drum 2. The use of plastic material is also important because it allows costs to be reduced.

[0018] Conveniently, the first and second walls 41, 42 are joined to each other by die-casting.

[0019] The first wall 41 contributes to delimiting the washing compartment 20. It is thus intended to come into contact with the articles to be washed located inside the washing compartment 20. Advantageously, the rear end 40 comprises means 409 for pushing the articles to be washed. In this regard, the pushing means 409 comprise ribs 410 made as one with the first wall 41. The ribs 410 project towards the inside of the drum 2. More specifically, the ribs 410 project towards the opening 22. Further, the ribs 410 comprise passages 411 which place the washing compartment 20 in fluid communication with a gap 412 which is interposed between the first and second walls 41, 42 along the direction of the axis 21 of rotation. Conveniently, the second wall 42 comprises the coaxial hole 5 for receiving the rotational drive shaft 3. Conveniently, the rotational drive shaft 3 is made of a metallic material (typically steel).

[0020] In the preferred embodiment illustrated in the accompanying drawings, the flank 4 is a rear end 40 of the drum 2 at least partly facing the opening 22 for introducing and extracting the articles to be washed (this solution applies to front-loading laundry washing machines).

[0021] The flank 4 comprises first means 43 for balancing the mass of the articles to be washed in the drum 2. The first balancing means 43 comprise a first annular chamber 430 which encircles the axis 21 of rotation and which is suitable for containing first rolling members 431. Conveniently, the first balancing means 43 comprise: the first annular chamber 430 filled with a viscous liquid (for example, silicone oil) and first rolling members 431 which roll along the first annular chamber 430.

[0022] In effect, during spin drying, centrifugal force causes the laundry articles to move against the inside wall of the drum 2. This may lead to vibrations and noise due to eccentricity.

[0023] At least for drum rotation speeds higher than a predetermined threshold, the first balancing means 43 move to positions which are diametrically opposite (relative to the axis of rotation 21) to those where an imaginary eccentric mass determined by the presence of the laundry articles can be located. This allows vibrations and noise to be reduced.

[0024] The first rolling members 431 comprise steel balls. Typically, the first rolling members 431 comprise 10 to 15 balls. Preferably, the balls are between 13 and 17 millimetres in diameter. In the first annular chamber 430 there is a quantity of viscous liquid of between 0.25 and 0.65kg.

[0025] The first annular chamber 430 is formed by coupling the first and second walls 41, 42. The first annular chamber 430 is fluid-dynamically sealed. In the non-limiting example embodiment of Figure 5, the first annular

chamber 430 is made by combining together a groove 433 defined by the second wall 42 and a flat surface 444 defined by the first wall 41. Conveniently, the first rolling members 431 are completely inside the groove 433. Conveniently, the first annular chamber 430 comprises an opening which can be blocked by a fluid-tight plug and which is used for pouring in the viscous liquid (once the first rolling members 431 have been stably inserted into the groove 433). The first rolling members 431 are of a size such that they cannot be extracted from the first chamber 430 through the opening.

[0026] The drum 2 comprises a lateral annular band 7 which encircles the axis 21 of rotation of the drum 2. The band 7 comprises at least one bent edge 71 which forms a first seat 710 for receiving and retaining a perimeter portion of the flank 4, thus making the band 7 and the flank 4 integral with each other. Conveniently, the band 7 is made from metal sheet, typically stainless steel. It is obtained by calendering. Normally, the band 7 is between 0.35 and 0.65 millimetres thick.

[0027] Advantageously, the first seat 710 receives and retains a perimeter portion of the first and second walls 41, 42, the perimeter portion of the first wall 41 being adjacent to the perimeter portion of the second wall 42. More specifically, the first seat 710 at least partly encircles two transversal surfaces of the perimeter portion of the first wall 41 and three transversal surfaces of the perimeter portion of the second wall 42.

[0028] More specifically, the first seat 710 comprises:

- a first annular stretch 711 which extends in a direction which is substantially radial to the axis 21 of rotation and which is in contact with the first wall 41;
- a second annular stretch 712 which is transversal (preferably at right angles) to the first annular stretch 711 and which is in contact with the first and second walls 41, 42;
- a third annular stretch 713 which extends in a direction which is substantially radial to the axis 21 of rotation and which is in contact with the second wall 42; the first stretch 711, the second stretch 712 and the third stretch 713 forming a concavity that faces towards the axis 21 of rotation;
- a fourth annular stretch 714 which is transversal (preferably at right angles) to the third annular stretch 713 and which is in contact with the second wall 42. The fourth stretch 714 comprises an edge of the annular band 7. Thus, the fourth stretch 714 is not in contact with other portions of the annular band 7 apart from the third stretch 713.

[0029] Advantageously, the first and second walls 41, 42 are at least partly interposed between the first and second stretches 711, 713. Advantageously, the second wall 42 is at least partly interposed between the second and fourth stretches 712, 714.

[0030] Conveniently the washing appliance 1 comprises a flange 6 which encircles the opening 22 for intro-

ducing and extracting the laundry articles.

[0031] The lateral band 7 comprises a second bent edge 72 forming a second seat 720 for receiving and retaining the flange 6, thus making the lateral band 7 and the flange 6 integral with each other. Conveniently, the flange 6 comprises a third and a fourth wall 45, 46 which are irremovably connected to each other (for example by die casting). The third wall 45 is interposed between the first and fourth walls 41, 46.

[0032] Advantageously, the second seat 720 receives and retains a perimeter portion of the third and fourth walls 45, 46, the perimeter portion of the third wall 45 being adjacent to the perimeter portion of the fourth wall 46.

[0033] The flange 6 comprises second means 44 for balancing the mass of the laundry articles to be washed in the drum 2. The second balancing means 44 comprise: a second annular chamber 440 filled with a viscous liquid, encircling the axis 21 of rotation, and second rolling members 432 which roll along the second annular chamber 440, the second annular chamber 440 being formed by the combination of the third and fourth walls 45, 46.

[0034] The technical features described above in connection with the first balancing means 43 also apply to the second balancing means 44. More specifically, the adjectives "first" and "second" referring to the expressions "balancing means", "annular chamber" and "rolling members" are used only to distinguish the components from each other. For example, the washing appliance 1 according to this invention might have the second balancing means 44 or a second annular chamber 440 or second rolling members 432 irrespective of whether or not it has first balancing means 43, a first annular chamber 430 or first rolling members 431. Similarly, the presence of a third and a fourth wall 45, 46 might be independent of the first and second walls 41, 42.

[0035] Conveniently, the drum 2 is substantially cylindrical. The annular band 7 corresponds to the lateral surface of the cylinder. The flank 4 is located at one of the two bases of the cylinder. The flange 6 is located at the other base of the cylinder. Advantageously, the drum 2 (more specifically, one base of the cylindrical drum 2) has a variable or constant diameter of between 400 and 420 millimetres. The annular band 7 is at least partly interposed between the flange 6 and the flank 4.

[0036] The annular band 7 contributes to delimiting the gap 412. More specifically, at the gap 412, the annular band 7 comprises a plurality of holes 413. The holes 413, in combination with the passages 411, allow the washing compartment 20 to be placed in fluid communication with the outside of the drum 2 (for example, to facilitate draining off of the water from the laundry articles during spin drying).

[0037] This invention also has for an object a method for making a drum for a washing appliance having one or more of the technical features described above.

[0038] The method comprises the steps of:

- overmoulding the second wall 42 and the rotational drive shaft 3;
- joining (more specifically, welding) the first and second walls 41, 42 to each other by die-casting thereby obtaining the flank 4;
- clamping the lateral band 7 to the flank 4 and to the flange 6.

[0039] Advantageously, the step of joining the first and second walls 41, 42 to each other by die-casting is preceded by the step of resting the first rolling members 431 on the portion of the first annular chamber 430 formed by the second wall 42. Preferably, the portion of the first annular chamber 430 formed by the second wall 42 is an extended portion, the groove 433 being made entirely on the second wall 42, so as to obtain a more secure housing for the first rolling members 431 during the subsequent welding operation. The step of die-casting the first and second walls 41, 42 determines the formation of the first annular chamber 430 delimited by the first and second walls 41, 42.

[0040] Advantageously, the step of clamping the lateral band 7 to the flange 6 is preceded by the step of irremovably connecting the third and fourth walls 45, 46 of the flange 6 by die-casting. Advantageously, the step of joining the first and second walls 41, 42 to each other by die-casting is followed by the step of filling into the first chamber 430 the viscous liquid that surrounds the first rolling members 431. The step of filling the viscous liquid into the first chamber 430 comprises the step of pouring the liquid in through the opening which can be closed by a plug.

[0041] The invention achieves important advantages and provides a device which is functional and feasible, that is to say, a laundry washing machine where the eccentric loads inside the drum can be well balanced, while at the same time limiting the cost of the machine as a whole. More specifically, it allows the components of the drum 2 to be optimized. More specifically, the flank 4 (which, in the preferred embodiment, coincides with the rear end 40 of the drum 2) has important structural functions, making it possible to eliminate the need for a tripod joint. Moreover, it can be easily connected to the lateral band 7, plays an important role in balancing the drum 2 and also integrates the means 409 for pushing the laundry articles to be washed (known as "lifters" in the jargon of the trade).

[0042] Lastly, the invention provides a laundry washing machine whose drum is considerably increased in strength thanks to the fact that the rear end of the drum is made like a box-shaped structure as a result of welding the first wall 41 and the second wall 42 to each other. It shall be understood that the invention described above may be modified and adapted in several ways without departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by other technically equivalent elements. Further, the embodiments of the invention may be made in any size,

depending on requirements.

Claims

1. A washing appliance comprising:

- i) a drum (2) which forms a washing compartment (20) for the articles to be washed, the drum (2) being rotatable about an axis (21) of rotation and comprising an opening (22) through which the articles to be washed can be introduced and extracted;
- ii) a shaft (3) for rotationally driving the drum (2) and extending along the axis (21) of rotation;

the drum (2) in turn comprising a flank (4) which extends transversally to the rotational drive shaft (3) and which partly delimits the washing compartment (20) of the drum (2);
wherein the flank (4) comprises:

- a hole (5) coaxial with the axis (21) of rotation in which the rotational drive shaft (3) of the drum (2) is inserted;
- a first wall (41) and a second wall (42) placed side by side and irremovably connected, the first wall (41) contributing to delimiting the washing compartment (20);
- first means (43) for balancing the mass of the articles to be washed in the drum (2), the first balancing means (43) comprising: a first annular chamber (430) which encircles the axis (21) of rotation and which is suitable for containing first rolling members (431); the first annular chamber (430) being formed by coupling the first and second walls (41, 42);

characterized in that the flank (4) comprises pushing means (409) for pushing the articles to be washed, the pushing means (409) comprising ribs (410) made as one with the first wall (41) and projecting towards the inside of the drum (2).

2. The washing appliance according to claim 1, **characterized in that**:

- the shaft for rotationally driving the drum (2) is irremovably embedded in the coaxial hole (5);
- the second wall (42) comprises the coaxial hole (5).

3. The washing appliance according to claim 1 or 2, **characterized in that** the first means (43) for balancing the mass of articles to be washed in the drum (2) comprise: the first annular chamber (430) filled with a viscous liquid and first rolling members (431) which roll along the first annular chamber (430).

4. The washing appliance according to any of the foregoing claims, **characterized in that** the first and second walls (41, 42) are made at least partly of a material having a plastic matrix.

5. The washing appliance according to any of the foregoing claims, **characterized in that** the flank (4) is a rear end (40) of the drum (2) at least partly facing the opening (22) for introducing and extracting the articles to be washed.

6. The washing appliance according to any of the foregoing claims, **characterized in that** the drum (2) comprises a lateral annular band (7) which encircles the axis (21) of rotation of the drum (2), the band (7) comprising at least one bent edge (71) forming a first seat (710) for receiving and retaining a perimeter portion of the flank (4), thus making the band (7) and the flank (4) integral with each other.

7. The washing appliance according to claim 6, **characterized in that** the ribs (410) at least partly surmount the band (7).

8. The washing appliance according to claim 6 or 7, **characterized in that** the ribs (410) comprise passages (411) which place the washing compartment (20) in fluid communication with a gap (412) which is interposed between the first and second walls (41, 42) along the direction of the axis (21) of rotation; the annular band (7) contributing to delimiting the gap (412) and comprising a plurality of holes (413) at the gap (412); the holes (413), in combination with the passages (411), allowing the washing compartment (20) to be placed in fluid communication with the outside of the drum (2).

9. The washing appliance according to any of the foregoing claims, **characterized in that** it comprises a flange (6) which encircles the opening (22) for introducing and extracting the articles to be washed.

10. The washing appliance according to claim 9 when it depends directly or indirectly on claim 6, **characterized in that** the lateral band (7) comprises a second bent edge (72) forming a second seat (720) for receiving and retaining the flange (6), thus making the lateral band (7) and the flange (6) integral with each other.

11. The washing appliance according to claim 9 or 10, **characterized in that** the flange (6) comprises second means (44) for balancing the mass of the articles to be washed in the drum (2), the second balancing means (44) comprising: a second annular chamber (440) filled with a viscous liquid, encircling the axis (21) of rotation, and second rolling members (432) which roll along the second annular chamber (440),

the second annular chamber (440) being formed by the combination of a third and a fourth wall (45, 46) forming part of the flange (6) and being irremovably connected to each other.

Patentansprüche

1. Waschvorrichtung, umfassend:

- i) eine Trommel (2), die ein Waschabteil (20) für die zu waschenden Artikel bildet, wobei die Trommel (2) um eine Drehachse (21) herum drehbar ist und eine Öffnung (22) umfasst, durch die hindurch die zu waschenden Artikel eingefüllt und entnommen werden können;
- ii) eine Welle (3) zum drehenden Antreiben der Trommel (2), und sich entlang der Drehachse (21) erstreckend;

wobei die Trommel (2) ihrerseits eine Flanke (4) umfasst, die sich quer zur Drehantriebswelle (3) erstreckt und die teilweise das Waschabteil (20) der Trommel (2) begrenzt;

wobei die Flanke (4) umfasst:

- ein zur Drehachse (21) koaxiales Loch (5), in das die Drehantriebswelle (3) der Trommel (2) eingesetzt ist;
- eine erste Wand (41) und eine zweite Wand (42), die nebeneinander platziert und unlösbar verbunden sind, wobei die erste Wand (41) dazu beiträgt, das Waschabteil (20) zu begrenzen;
- erste Mittel (43) zum Auswuchten der Masse der zu waschenden Artikel in der Trommel (2), wobei die ersten Auswuchtmittel (43) umfassen: eine erste ringförmige Kammer (430), die die Drehachse (21) umschließt und die dafür geeignet ist, erste Rollkörper (431) zu enthalten; wobei die erste ringförmige Kammer (430) durch Koppeln der ersten und zweiten Wand (41, 42) gebildet wird;

dadurch gekennzeichnet, dass die Flanke (4) Druckmittel (409) zum Drücken der zu waschenden Artikel umfasst, wobei die Druckmittel (409) Rippen (410) umfassen, die einteilig mit der ersten Wand (41) gemacht sind und zur Innenseite der Trommel (2) hin vorspringen.

2. Waschvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass:**

- die Welle zum drehenden Antreiben der Trommel (2) unlösbar in das koaxiale Loch (5) eingebettet ist;
- die zweite Wand (42) das koaxiale Loch (5) umfasst.

3. Waschvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die ersten Mittel (43) zum Auswuchten der Masse von zu waschenden Artikeln in der Trommel (2) umfassen: die erste ringförmige Kammer (430), die mit einer viskosen Flüssigkeit gefüllt ist, und erste Rollkörper (431), die entlang der ersten ringförmigen Kammer (430) rollen.

4. Waschvorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste und zweite Wand (41, 42) mindestens teilweise aus einem Material gemacht sind, das eine Kunststoffmatrix aufweist.

5. Waschvorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Flanke (4) ein hinteres Ende (40) der Trommel (2) ist, das mindestens teilweise der Öffnung (22) zum Einfüllen und Entnehmen der zu waschenden Artikel zugewandt ist.

6. Waschvorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Trommel (2) ein seitliches ringförmiges Band (7) umfasst, das die Drehachse (21) der Trommel (2) umschließt, wobei das Band (7) mindestens eine gebogene Kante (71) umfasst, die einen ersten Sitz (710) zum Aufnehmen und Halten eines Umfangsabschnitts der Flanke (4) bildet, wodurch das Band (7) und die Flanke (4) einstückig miteinander gemacht werden.

7. Waschvorrichtung nach Anspruch 6, **dadurch gekennzeichnet, dass** die Rippen (410) das Band (7) mindestens teilweise überragen.

8. Waschvorrichtung nach Anspruch 6 oder 7, **dadurch gekennzeichnet, dass** die Rippen (410) Durchlässe (411) umfassen, die das Waschabteil (20) mit einem Spalt (412) in Fluidkommunikation bringen, der entlang der Richtung der Drehachse (21) zwischen der ersten und zweiten Wand (41, 42) eingefügt ist; wobei das ringförmige Band (7) dazu beiträgt, den Spalt (412) zu begrenzen, und eine Vielzahl von Löchern (413) am Spalt (412) umfasst; wobei es die Löcher (413) in Kombination mit den Durchlässen (411) dem Waschabteil (20) ermöglichen, mit der Außenseite der Trommel (2) in Fluidkommunikation gebracht zu werden.

9. Waschvorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** sie einen Flansch (6) umfasst, der die Öffnung (22) zum Einfüllen und Entnehmen der zu waschenden Artikel umschließt.

10. Waschvorrichtung nach Anspruch 9 in direkter oder indirekter Abhängigkeit von Anspruch 6, **dadurch**

gekennzeichnet, dass das seitliche Band (7) eine zweite gebogene Kante (72) umfasst, die einen zweiten Sitz (720) zum Aufnehmen und Halten des Flansches (6) bildet, wodurch das seitliche Band (7) und der Flansch (6) einstückig miteinander gemacht werden.

11. Waschvorrichtung nach Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** der Flansch (6) zweite Mittel (44) zum Auswuchten der Masse der zu waschenden Artikel in der Trommel (2) umfasst, wobei die zweiten Auswuchtmittel (44) umfassen: eine mit einer viskosen Flüssigkeit gefüllte zweite ringförmige Kammer (440), die die Drehachse (21) umschließt, und zweite Rollkörper (432), die entlang der zweiten ringförmigen Kammer (440) rollen, wobei die zweite ringförmige Kammer (440) durch die Kombination einer dritten und einer vierten Wand (45, 46) gebildet wird, die Bestandteil des Flansches (6) bilden und unlösbar miteinander verbunden sind.

Revendications

1. Lave-linge comprenant :

- i) un tambour (2) qui forme un compartiment de lavage (20) pour les articles à laver, le tambour (2) étant rotatif autour d'un axe (21) de rotation et comprenant une ouverture (22) au travers de laquelle les articles à laver peuvent être introduits et extraits ;
- ii) un arbre (3) pour l'entraînement rotatif du tambour (2) et l'extension le long de l'axe (21) de rotation ;

le tambour (2) comprenant à son tour un flanc (4) qui s'étend transversalement à l'arbre d'entraînement rotatif (3) et qui délimite partiellement le compartiment de lavage (20) du tambour (2) ; dans lequel le flanc (4) comprend :

- un trou (5) coaxial avec l'axe (21) de rotation dans lequel l'arbre d'entraînement rotatif (3) du tambour (2) est inséré ;
- une première paroi (41) et une deuxième paroi (42) placées côte à côte et raccordées de manière inamovible, la première paroi (41) contribuant à délimiter le compartiment de lavage (20) ;
- des premiers moyens (43) pour l'équilibrage de la masse des articles à laver dans le tambour (2), les premiers moyens d'équilibrage (43) comprenant: une première chambre annulaire (430) qui encercle l'axe (21) de rotation et qui est appropriée pour contenir des premiers éléments de roulement (431) ; la première chambre annulaire (430) étant formée par couplage des

première et deuxième parois (41, 42) ;

caractérisé en ce que le flanc (4) comprend des moyens de poussée (409) pour la poussée des articles à laver, les moyens de poussée (409) comprenant des nervures (410) fabriquées d'un seul tenant avec la première paroi (41) et faisant saillie vers l'intérieur du tambour (2).

2. Lave-linge selon la revendication 1, **caractérisé en ce que** :

- l'arbre pour l'entraînement rotatif du tambour (2) est intégré de manière inamovible dans le trou coaxial (5) ;
- la deuxième paroi (42) comprend le trou coaxial (5).

3. Lave-linge selon la revendication 1 ou 2, **caractérisé en ce que** les premiers moyens (43) pour l'équilibrage de la masse des articles à laver dans le tambour (2) comprennent : la première chambre annulaire (430) remplie d'un liquide visqueux et des premiers éléments de roulement (431) qui roulent le long de la première chambre annulaire (430).

4. Lave-linge selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les première et deuxième parois (41, 42) sont fabriquées au moins partiellement en un matériau présentant une matrice plastique.

5. Lave-linge selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le flanc (4) est une extrémité arrière (40) du tambour (2) faisant face au moins partiellement à l'ouverture (22) pour l'introduction et l'extraction des articles à laver.

6. Lave-linge selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le tambour (2) comprend une bande annulaire latérale (7) qui encercle l'axe (21) de rotation du tambour (2), la bande (7) comprenant au moins une arête pliée (71) formant un premier siège (710) pour la réception et la retenue d'une portion de périmètre du flanc (4), rendant ainsi la bande (7) et le flanc (4) solidaires l'un avec l'autre.

7. Lave-linge selon la revendication 6, **caractérisé en ce que** les nervures (410) surmontent au moins partiellement la bande (7).

8. Lave-linge selon la revendication 6 ou 7, **caractérisé en ce que** les nervures (410) comprennent des passages (411) qui placent le compartiment de lavage (20) en communication de fluide avec une fente (412) qui est interposée entre les première et deuxième parois (41, 42) le long de la direction de l'axe

(21) de rotation ; la bande annulaire (7) contribuant à délimiter la fente (412) et comprenant une pluralité de trous (413) au niveau de la fente (412) ; les trous (413), en combinaison avec les passages (411), permettant au compartiment de lavage (20) d'être placé en communication de fluide avec le côté extérieur du tambour (2).

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9. Lave-linge selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend une bride (6) qui encercle l'ouverture (22) pour l'introduction et l'extraction des articles à laver.

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10. Lave-linge selon la revendication 9 lorsqu'elle dépend directement ou indirectement de la revendication 6, **caractérisé en ce que** la bande latérale (7) comprend une seconde arête pliée (72) formant un second siège (720) pour la réception et la retenue de la bride (6), rendant ainsi la bande latérale (7) et la bride (6) solidaires l'une avec l'autre.

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11. Lave-linge selon la revendication 9 ou 10, **caractérisé en ce que** la bride (6) comprend des seconds moyens (44) pour l'équilibrage de la masse des articles à laver dans le tambour (2), les seconds moyens d'équilibrage (44) comprenant : une seconde chambre annulaire (440) remplie d'un liquide visqueux, encerclant l'axe (21) de rotation, et des seconds éléments de roulement (432) qui roulent le long de la seconde chambre annulaire (440), la seconde chambre annulaire (440) étant formée par la combinaison d'une troisième et une quatrième paroi (45, 46) formant une partie de la bride (6) et étant raccordées de manière inamovible l'une à l'autre.

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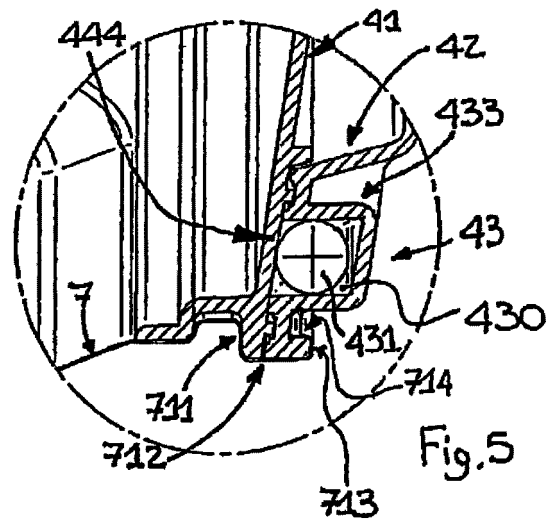
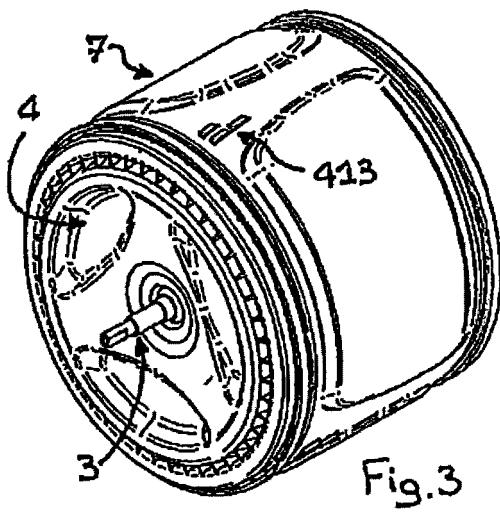
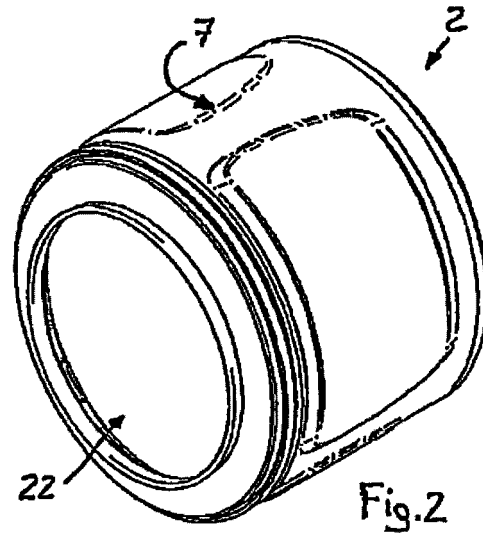
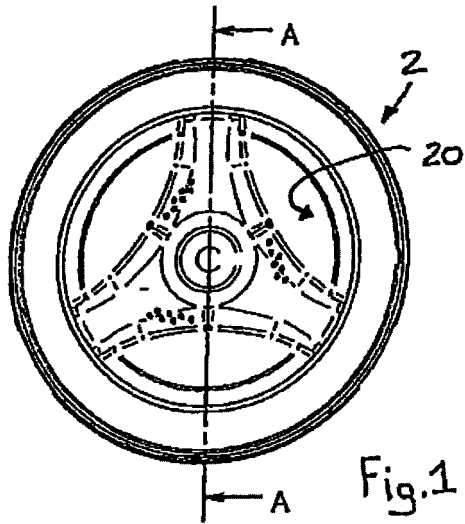
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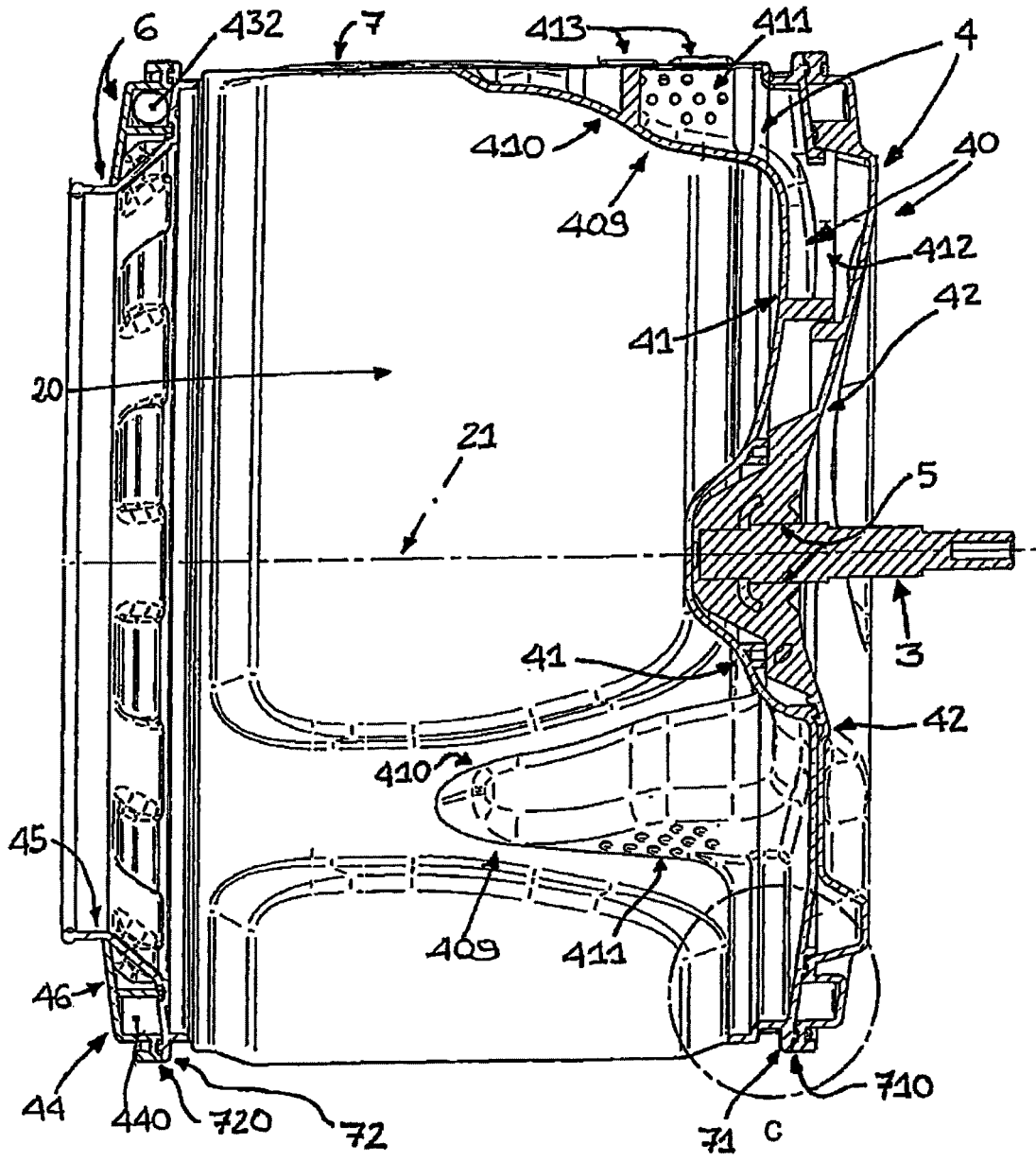
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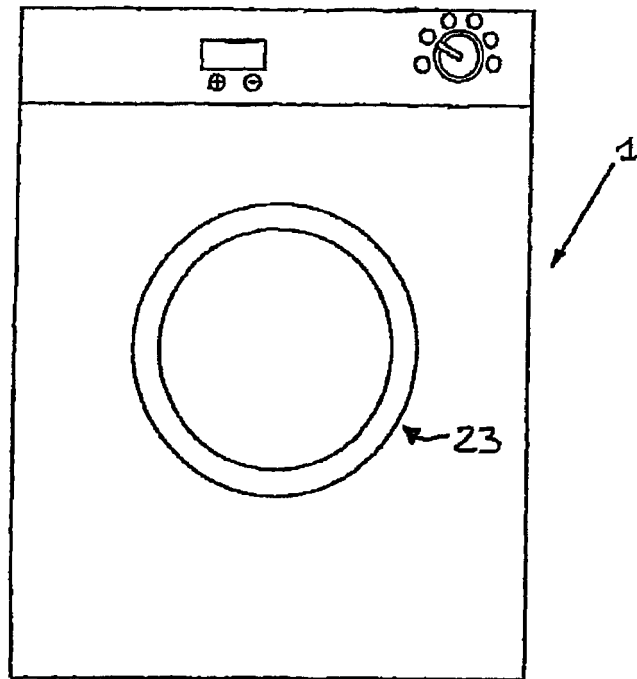


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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