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(54) **Tub discharge apparatus for washing machines**

(57) The machine of the invention has a function of washing laundry and comprises a washing tub (1); at least one tub discharge pipe (2) provided under the tub (1); and a tub discharge apparatus (6) mounted to the internal surface (4) of the pipe (2). The tub discharge apparatus (6) therein comprises a sealing member (7) in elastic form which has at least one opening (12) at the

middle thereof for water passage, external surface (13) of which fits into the internal surface (4) in a sealed manner; at least one guide piece (8) which extends downward from the lower part of the sealing member (7); by water movement an upwardly and downwardly linearly movable flap (9) which is on the guide piece (8) and which closes the opening (12) on the sealing member (7) at upper position.

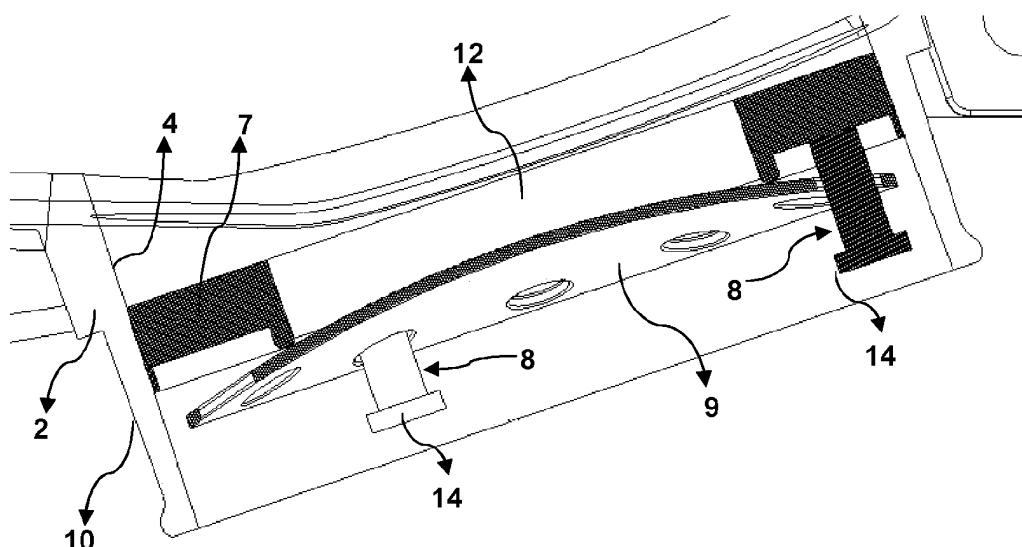


Figure – 5

Description

Technical Field

[0001] This invention relates to tub discharge apparatus in the machines with laundry washing function.

Prior Art

[0002] As known, washing machines are machines which perform washing with powder detergent. Fully dissolution of powder detergent in water by mixing it into the washing water of the machine is important both for the cleaning of the laundry and efficient operation of the machine (because of the powder anti-scaling agents added to the detergent). In these machines, powder detergents, which are not fully dissolved in the washing water, accumulate under the wash tub and are discharged through the waste water outlet during the first water exchange. This leads to wasting of the detergent and insufficient cleaning of the laundry, naturally.

[0003] Published patent application no DE10065404 of the prior art discloses a floatable and elastic ball float which closes tub discharge pipe. When water is taken into the tub, the float in the tub discharge bellow closes said discharge pipe by ascending. Because of the elasticity of the float, which moves normally downward during the water discharge, the float can be stuck at the lower parts of the tub discharge bellow. Apart from that, since the float relocates upward and downward a lot in the bellow, there is a risk of some detergent pass into the tub discharge bellow while water is taken into the tub and the float has not closed the tub discharge pipe yet.

Brief Description of the Invention

[0004] The machine of the invention has a function of washing laundry and comprises a washing tub; at least one tub discharge pipe provided under the tub; and a tub discharge apparatus mounted to the internal surface of the pipe. The tub discharge apparatus therein comprises a sealing member in elastic form which has at least one opening at the middle thereof for water passage, external surface of which fits into the internal surface of said pipe in a sealed manner. Besides, the apparatus comprises at least one guide piece which extends downward from the lower part of the sealing member; by water movement an upwardly and downwardly linearly movable flap which is on the guide piece and which closes the opening on the sealing member at upper position.

[0005] Upper and lower sides of the flap are separated when the flap closes the opening on the sealing member. Thus, undissolved detergent remains on the flap when the first water is taken into the machine and becomes usable by being dissolved while the washing continues. Therefore, the discharge of the undissolved detergent without being used is prevented.

Objectives of the Invention

[0006] The aim of the invention is to ensure fully dissolution of the used powder detergent in machines with the feature of washing laundry.

[0007] The other aim of the invention is to ensure fully dissolution of the powder detergent before the first water discharge.

[0008] Another aim of the invention is to prevent undissolved powder detergent from passing to the water discharge section.

[0009] A further aim of the invention is to form a tub discharge apparatus appropriate for the aforementioned aims.

[0010] Yet a further aim of the invention is to form a reliable, cost effective machine which is easy to produce and appropriate for the aims above.

Description of the Drawings

[0011] An exemplary internal chamber of the washing machine of the invention is shown in annexed figures, wherein;

Figure 1 is a frontal view of the water discharge section and the tub of the washing machine.

Figure 2 is a perspective view of the internal chamber of the washing machine tub.

Figure 3 is a perspective view of the internal chamber of the washing machine tub with the tub discharge apparatus.

Figure 4 is a perspective view of the tub discharge apparatus.

Figure 5 is a sectional view of the tub discharge apparatus assembled to the tub.

Figure 6 is a other sectional view of the tub discharge apparatus assembled to the tub.

[0012] The parts in the figures are individually enumerated and the corresponding terms of reference numbers are as follows:

Tub	(1)
Tub discharge pipe	(2)
Discharge pump	(3)
Internal surface	(4)
Rabbet	(5)
Tub discharge apparatus	(6)
Sealing member	(7)
Guide piece	(8)
Flap	(9)
External surface	(10)
Tub discharge bellow	(11)
Opening	(12)
External surface of the sealing member	(13)
Protrusion	(14)

(continued)

Flap opening

(15)

Description of the Invention

[0013] The machine of the invention is a machine with washing function and developed for ensuring the dissolution of the powder detergent which is mixed to the washing water and for preventing undissolved powder detergent from reaching water discharge section (i.e. tub discharge bellow, pump, etc.). Figures 1-3 show details about internal chamber of the washing machine of the invention (whole machine is not shown).

[0014] Figures 1-2 show tub (1), tub discharge pipe (2), discharge pump (3) and tub discharge bellow (11) together. As it is known, tub (1) is the part in which washing drum (not shown) rotates and washing process is performed. At least one tub discharge pipe (2), which discharges the water used in washing, is provided under the tub (1). Tub discharge bellow (11), which is mounted to the tub discharge pipe (2) (the bellow (11) is generally used as fitted on the external surface (10) of the tub discharge pipe (2)) is connected to said discharge pump (3). When any washing period is completed, water in the tub (1) is evacuated by the discharge pump (3). Figure 2 shows internal chamber of the tub (1) and at least one tub discharge apparatus (6) (shown in Figures 3-6) is placed in the internal surface (4) of the said tub discharge pipe (2). In order to fix the position of the apparatus (6) on the surface (4), at least one rabbet (5) (to prevent sliding of the apparatus (6) in any direction) can be used in the surface (4). (Figure 3 shows the apparatus (6) seated to the internal surface (4). The assembly of the apparatus (6) can easily be performed because of its simple structure and since the tub discharge apparatus (6) is mountable to and dismountable from aforesaid internal surface (4)).

[0015] Figure 4 shows tub discharge apparatus (6) developed for the machine of the invention. Tub discharge apparatus (6) comprises a sealing member (7); at least one guide piece (8) extending from lower part of the member (7) to downward; by the movement of water an upwardly and downwardly movable (floatable) flap (9) on the guide piece (8). (Flap (9) can be formed as flat plate and also it (9) can be used in an upwardly curved state as exemplary shown in figures 5-6.)

[0016] Sealing member (7) is a piece in elastic form which comprises at least one opening (12) (shown in figures 5-6) at the middle thereof for water passage; and external surface (13) of which fits in said internal surface (4) in a sealed manner. Thanks to the elasticity of the member (7), water tightness is ensured and also the member (7) is placed in the internal surface (4) of discharge pipe (2) by fitting tightly; and with at least one rabbet (5) described above (the rabbet (5) prevents sliding of the member (7) from its place) the position of the member (7) is fixed more safely.

[0017] At least one guide piece (8), extending from the lower part of the sealing member (7) to downward, is formed in order to ensure that upward and downward movement of the flap (9) is linear. Also, at the lower part of the piece (8) at least one protrusion (14), which limits downward movement of the flap (9) and extends outwardly from the piece (8), is located. At least one opening (15), in which guide piece (8) is entered, is located at the edge of the flap (9). Thanks to the opening (15), flap (9) is able to move linearly upward and downward on the guide piece (8).

[0018] Figures 5-6 show views of flap (9) in two different positions. In figure 5, the flap (9) is shown at upper position. Tub discharge bellow (11) and discharge pipe (2) as well as tub (1) are filled with water when the first water is taken into the machine. With the rise of water, the flap (9) closes the opening (12) on the sealing member (7) and separates upper and lower sides of the flap (9) from each other. Thus, undissolved detergent remains on the flap (9) when the first water is taken into the machine and becomes usable by being dissolved while the washing continues. Therefore, the discharge of the undissolved detergent without being used is prevented. Apart from that, movement opportunity at short distance is given to the flap (9) by keeping the height of the guide piece (8) short, and thus ensures quick opening and closing of the flap (9). Therefore, more secure structure is formed by reducing the discharge risk of undissolved detergent.

[0019] In figure 6 the flap (9) is shown at lower position. The flap (9) comes to said lower position while the water is evacuating by the pump (3). Said protrusion (14) determines the lower position of the flap (9). By disconnection of the flap (9) from the sealing member (7), tub water passes between these parts (7, 9) and is discharged by reaching respectively from discharge pipe (2) to bellow (11) and pump (3).

Claims

1. A machine with a function of washing laundry comprising a washing tub (1); at least one tub discharge pipe (2) provided under the tub (1); and a tub discharge apparatus (6) mounted to the internal surface (4) of the pipe (2) **characterized in that** the tub discharge apparatus (6) comprises; a sealing member (7) in an elastic form which has at least one opening (12) at the middle thereof for water passage, external surface (13) of which fits into said internal surface (4), at least one guide piece (8) which extends downward from the lower part of the sealing member (7); by water movement an upwardly and downwardly linearly movable a flap (9) which is on the guide piece (8) and which closes the opening (12) on the sealing member (7) at upper position.

2. A machine according to claim 1 **characterized by** comprising at least one rabbet (5), to which apparatus (6) is mounted, in said surface (4).
3. A machine according to claim 1 **characterized by** comprising at least one protrusion (14) which flap (9) leans on at lower position and which is under the guide piece (8). 5
4. A machine according to claim 1 **characterized by** comprising at least one opening (15) which is at the edge of the flap (9) and in which guide piece (8) enters. 10

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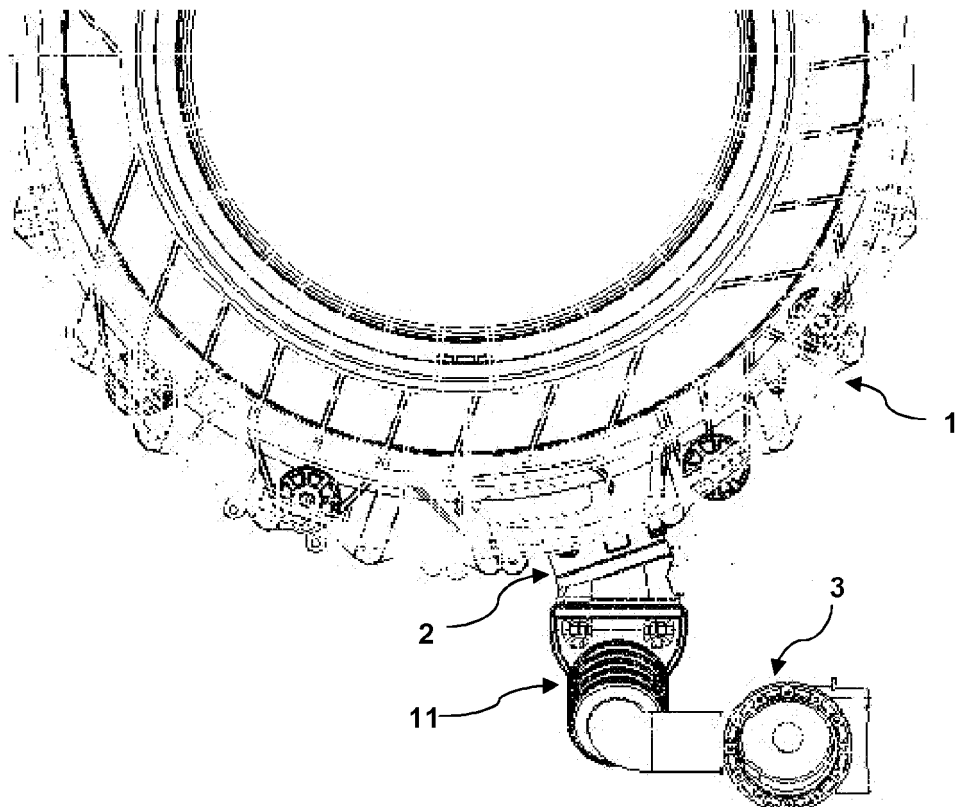


Figure - 1

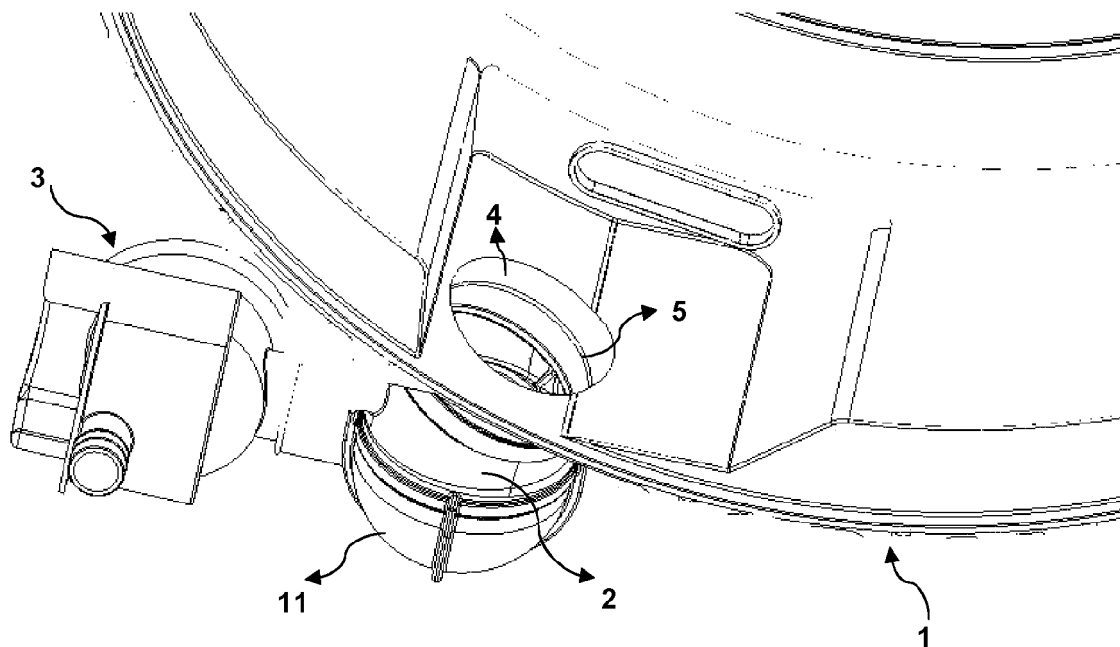


Figure - 2

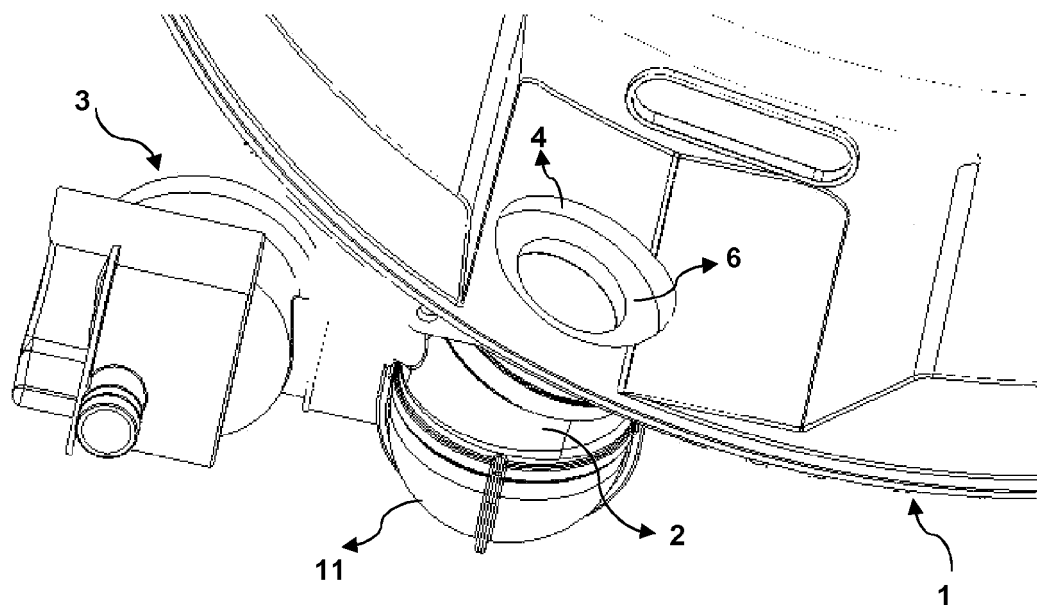


Figure – 3

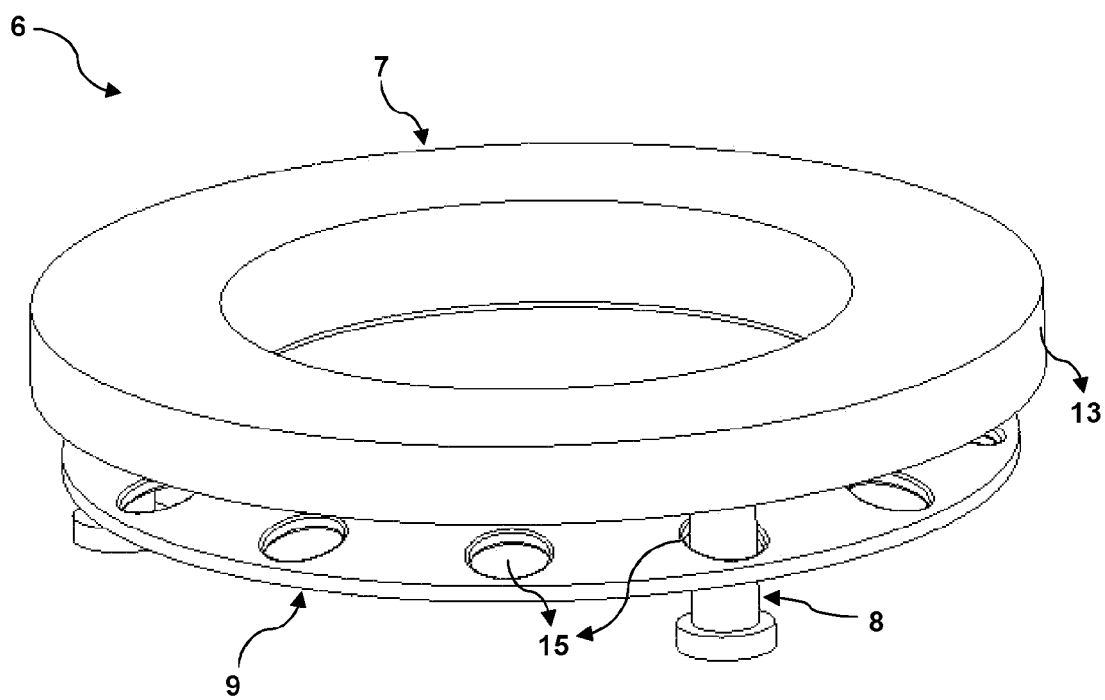


Figure – 4

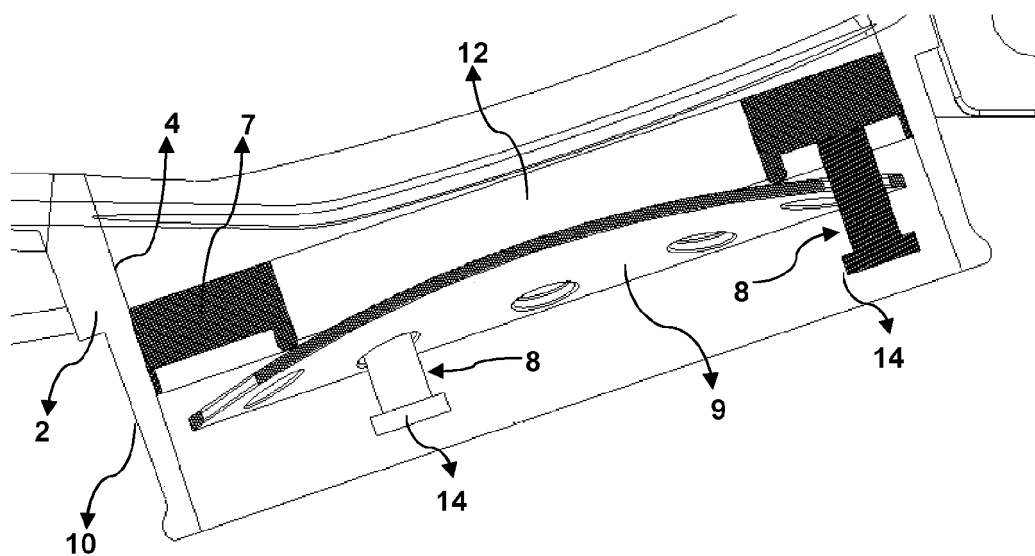


Figure – 5

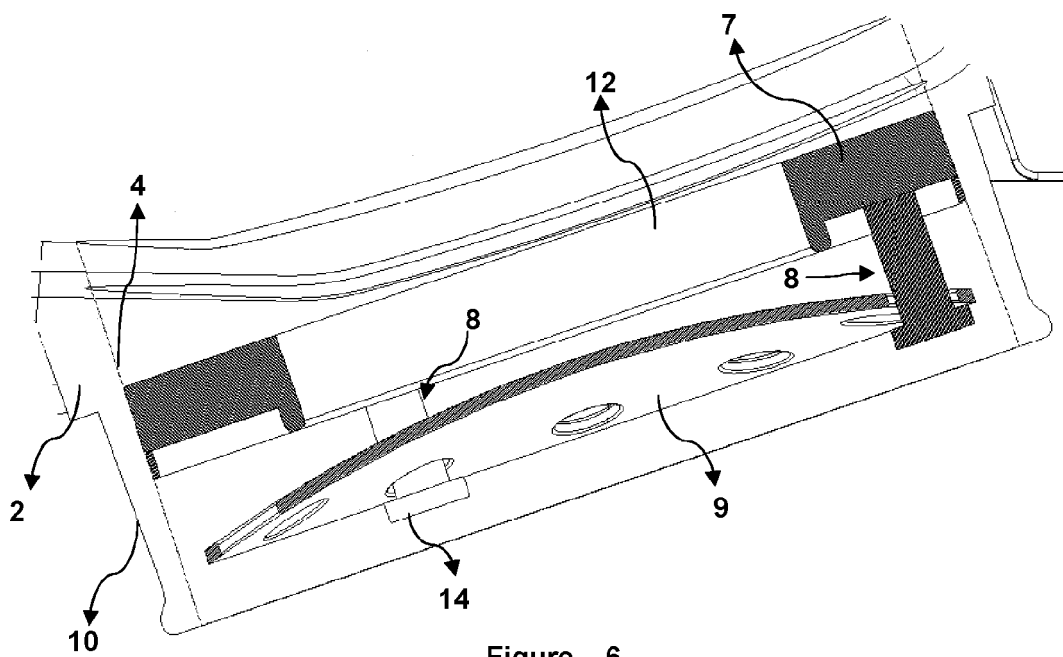


Figure – 6



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 1434

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 31 06 604 A1 (SCHWARZENBERG WASCHGERAETE [DD]) 18 March 1982 (1982-03-18) * page 4, line 27 - line 32; claim 1; figure 1 *	1-3	INV. D06F39/08
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A,D	DE 100 65 404 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 18 July 2002 (2002-07-18) * paragraphs [0017], [0018] *	1-4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
1	Place of search Munich	Date of completion of the search 21 November 2011	Examiner Westermayer, Wilhelm
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 18 1434

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The members are as contained in the European Patent Office EDP file on
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21-11-2011

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