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(54) **Detergent dissolving chamber for washing machines**

(57) A laundry washing machine comprising a washing tub (1); at least one water discharge (7) under the tub (1); detergent dissolving chamber (2) under the bottom surface (3) of the interior of the tub (1), to which the wash

water is directed before moving to the water discharge (7). The detergent dissolving chamber (2) is provided with helical walls (5) which direct the water flowing there-through to the centre.

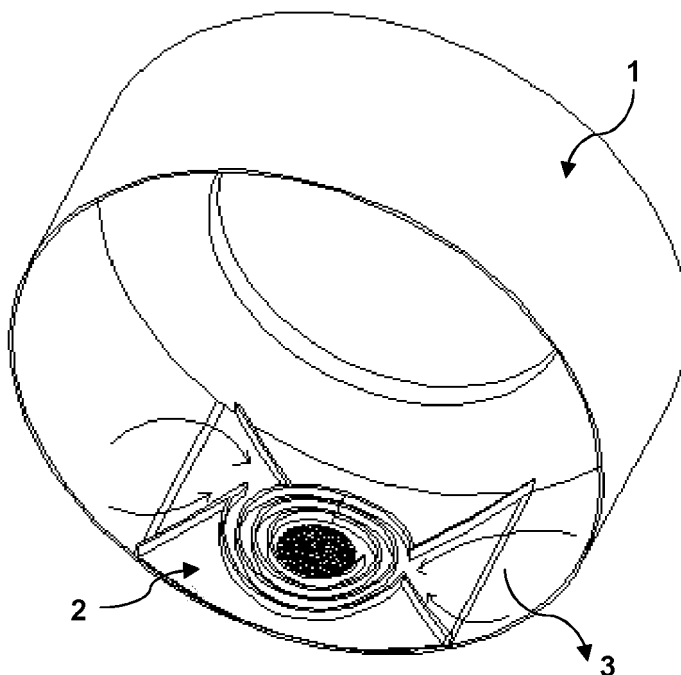


Figure – 1

Description

Technical Field

5 [0001] Present invention relates to interior detergent dissolving chambers provided in laundry washing machines.

Prior Art

10 [0002] As is known, laundry washing machines are machines which perform washing with powder detergent. Mixing and fully dissolving the powder detergent in the wash water of the machine is crucial both for cleaning of the clothes and for proper operation (due to the powder anti scaling agents added to the detergent) of the machine. Undissolved powder detergent in the wash water accumulates under the washing tub and is discharged through the water outlet during the first change of water. This leads to waste of detergent and insufficient cleaning of the clothes.

15 [0003] Published patent application No WO2009083365 of the prior art discloses a floatable ball disposed in a hose in the discharge hole and a stopper above said ball which prevents the ball from entering the tub. Said document discloses that the ball rises by water intake and blocks the stopper, preventing undissolved detergent from passing through to the discharge hole. In such machines, however, some undissolved detergent may enter into the water discharge hole during the period from the initial water intake to the blocking of the stopper by the ball.

20 [0004] Published patent application No WO2008119630 of the prior art discloses a mixer, driven by the drum motor or an external motor, which makes a rotational movement in the tub and assists to detergent dissolution. However, this is a costly solution for washing machines which does not facilitate manufacturing.

Brief Description of the Invention

25 [0005] The machine of the invention is a laundry washing machine which comprises a washing tub; at least one water discharge under the tub; detergent dissolving chamber under the bottom surface of the interior of the tub, to which the wash water is directed before moving to the water discharge. The detergent dissolving chamber is provided with helical walls which direct the water flowing therethrough to the centre. At least one mesh, through which the wash water moves to the water discharge, is located at the centre of the helical walls. It is ensured that undissolved detergent particles in
30 the wash water are circulated particularly through the helical walls to cover a long way. This facilitates dissolution of the detergent particles until they reach the mesh.

Objective of the Invention

35 [0006] The aim of the invention is to ensure that the powder detergent used in laundry washing machines is fully dissolved.

[0007] Another aim of the invention is to ensure full dissolution of the powder detergent prior to the initial water discharge.

[0008] Another aim of the invention is to prevent the undissolved detergent from entering into the water discharge.

40 [0009] Another aim of the invention is to form a detergent dissolving chamber which is convenient for the above mentioned aims.

[0010] Another aim of the invention is to provide a reliable machine suitable for the above mentioned aims, which is easy and cheap to manufacture.

Description of the Drawings

45 [0011] Interior of an exemplary laundry washing machine of the invention is illustrated in the annexed figures wherein:

Figure 1 is a perspective view of the washing machine tub and the detergent dissolving chamber.

50 Figure 2 is a front sectional view of the washing machine tub and the detergent dissolving chamber.

Figure 3 is a perspective view of the washing machine tub and the detergent dissolving chamber in a disassembled state.

55 Figure 4 is top and bottom perspective views of the detergent dissolving chamber.

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

Tub	(1)
Detergent dissolving chamber	(2)
5 Bottom surface	(3)
Outer walls	(4)
Helical walls	(5)
10 Mesh	(6)
Water discharge	(7)

15 Disclosure of the Invention

[0013] The machine of the invention is a laundry washing machine which is developed for ensuring dissolution of the powder detergent mixed with the wash water and for preventing the undissolved powder detergent from reaching the water discharge. Figures 1-4 show details of the interior of a laundry washing machine (the whole machine is not illustrated).

[0014] Figure 1-2 show illustrations of the washing machine tub (1) together with the detergent dissolving chamber (2). The tub (2) is the part where the washing drum (not shown) rotates and washing process takes place. At least one water discharge (7), through which the water used for washing is evacuated, is provided under the tub (1). When any washing period has been completed, the water discharged from the tub (1) is received (by means of pump and / or valve mechanisms which are not illustrated) by the water discharge (7) and is evacuated.

[0015] Before the water reaches the water discharge (7), the water passes through at least one detergent dissolving chamber (2) where undissolved powder detergent particles are dissolved as shown in Figure 1-2. In other words, all the undissolved powder detergent particles accumulate in this chamber (2) and remains there (while the water cannot enter into the water discharge (7)) until they are dissolved (in the tub (1)).

[0016] The detergent dissolving chamber (2) is provided under the bottom surface (3) of the interior of the tub (1) as shown in Figure 1-4. Said chamber (2) is provided with helical walls (5) which are formed so as to allow the wash water in the tub (1) to flow in a directed manner. Helical walls (5) have a form to direct the water flowing therethrough to centre of the helical walls. At least one mesh (6), through which the wash water moves to the water discharge (7), is located at the centre of the helical walls (5). At least one outer wall (4), which directs the wash water towards these walls (5), may be located at the outer side of the helical walls (5). One of the common characteristics of said walls (4, 5) is to direct the wash water towards the mesh (6). By this means, it is ensured that undissolved detergent particles in the wash water are circulated particularly through the helical walls (5) to cover a long way. This facilitates dissolution of the detergent particles until they reach the mesh (6).

[0017] Said detergent dissolving chamber (2) may be fixed to the bottom surface (3) of the interior of the tub (1) (or to the inlet of the water discharge (7)), or may be a separate component (shown in Figure 4) having a form which is easily attachable thereto and removable therefrom (as shown in Figure 3).

45 Claims

1. A laundry washing machine comprising a washing tub (1); at least one water discharge (7) under the tub (1); detergent dissolving chamber (2) under the bottom surface (3) of the interior of the tub (1), to which the wash water is directed before moving to the water discharge **characterized in that** the detergent dissolving chamber (2) comprises helical walls (5) which direct the water flowing therethrough to the centre.
2. A machine according to Claim 1 **characterized in that** at least one mesh (6), through which the wash water moves to the water discharge (7), is located at the centre of the helical walls (5).
3. A machine according to Claim 1 **characterized in that** at least one outer wall (4), which directs the wash water towards these walls (5), may be located at the outer side of the helical walls (5).
4. A machine according to Claim 1 **characterized in that** the detergent dissolving chamber (2) is fixed to the bottom surface (3) of the interior of the tub (1).

5. A machine according to Claim 1 **characterized in that** said chamber (2) has an attachable and removable form.

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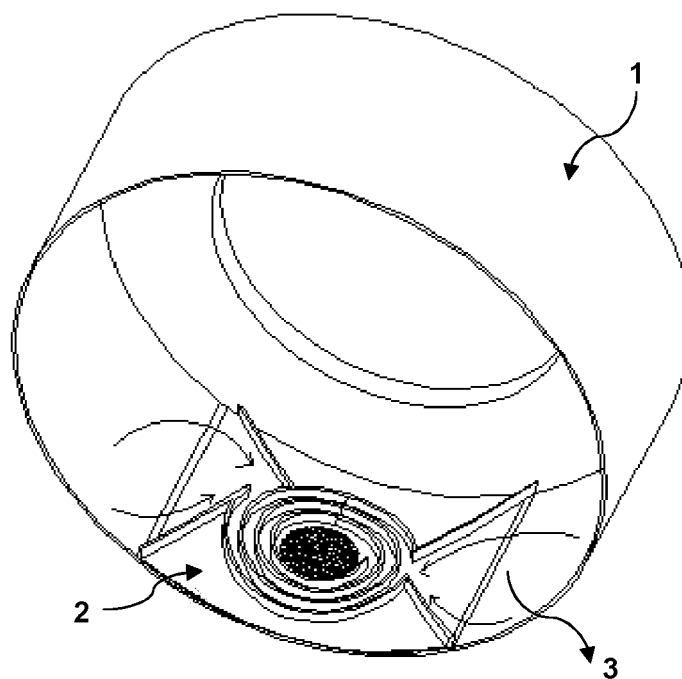


Figure - 1

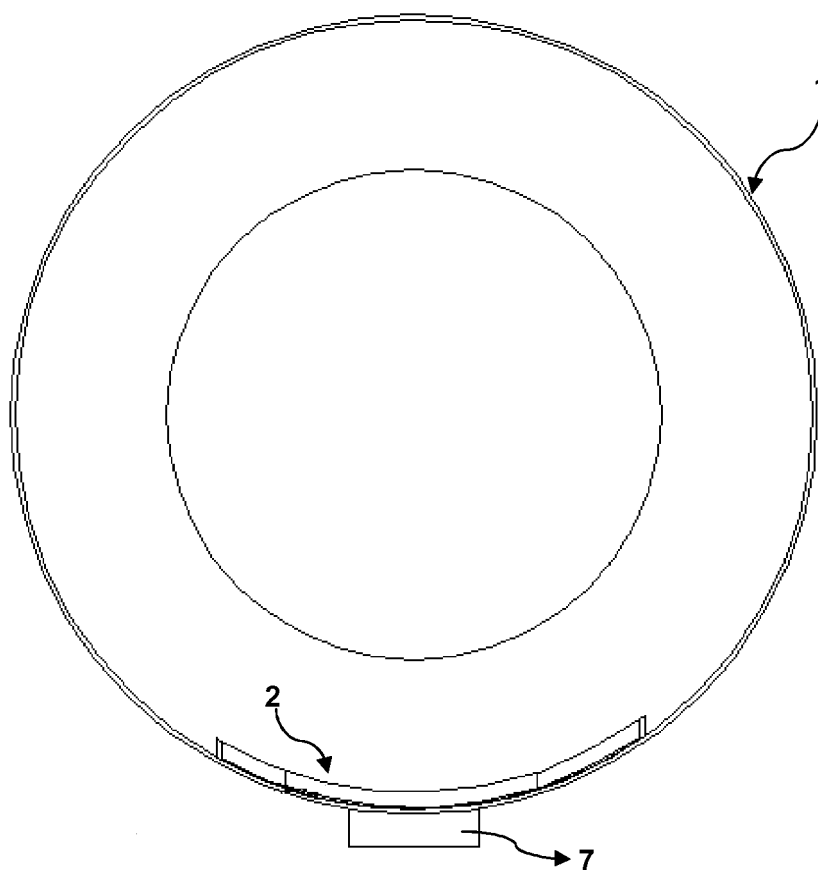


Figure - 2

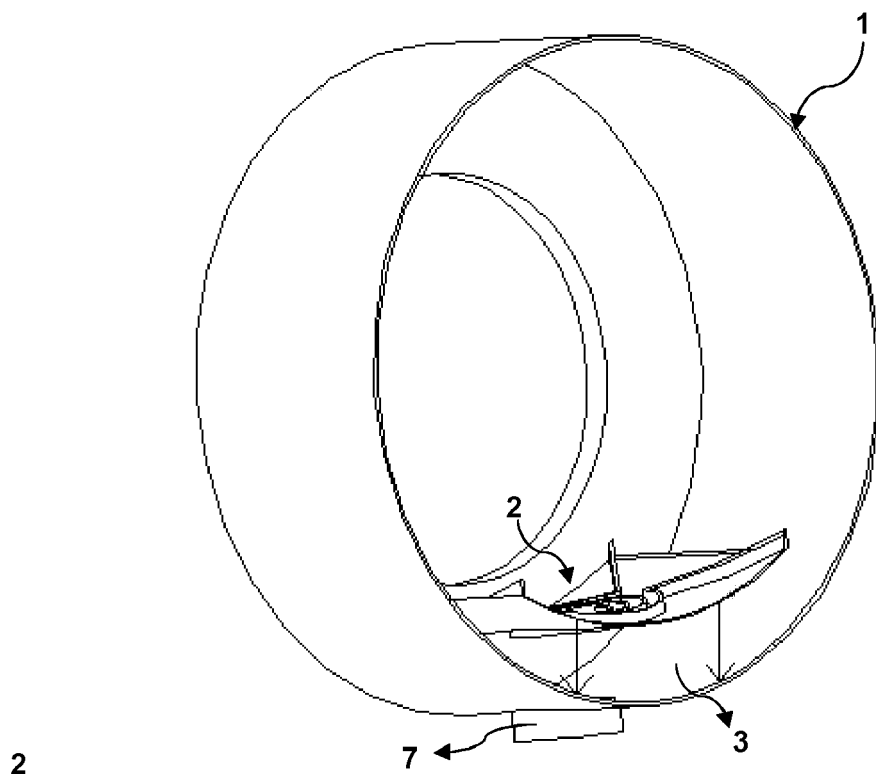


Figure - 3

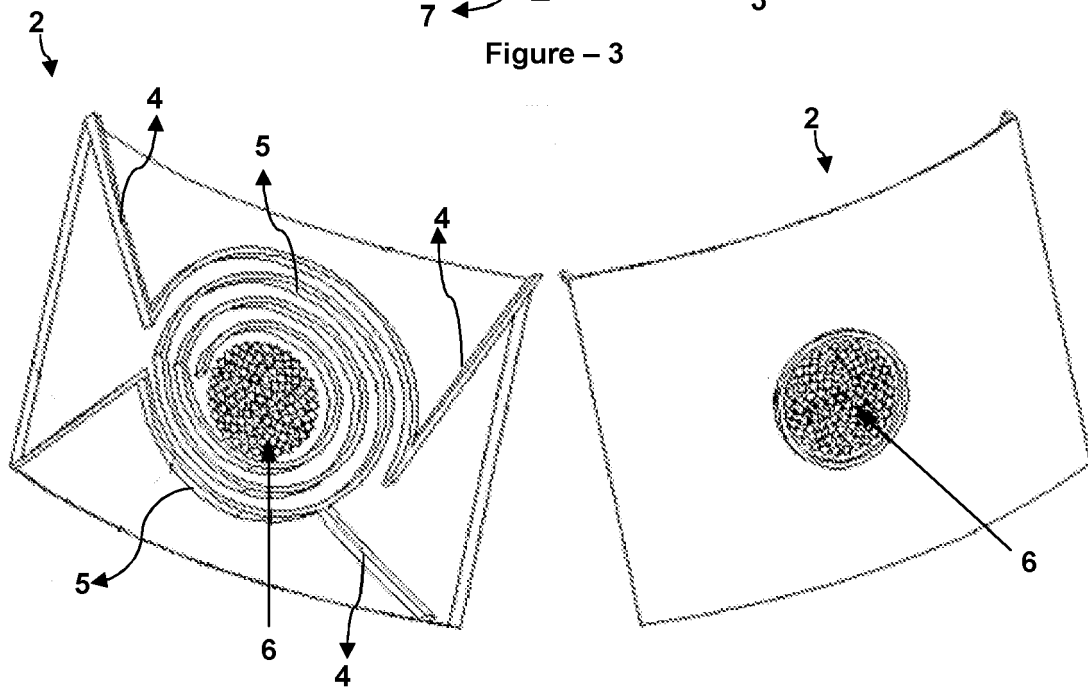


Figure - 4



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 1425

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	US 6 574 996 B1 (JACOBUS DWIGHT WILLIAM [US] ET AL) 10 June 2003 (2003-06-10) * column 2, line 53 - column 3, line 8 * * column 3, line 53 - line 62; figure 1 * -----	1,3,4	INV. D06F39/08
A	US 5 671 617 A (PARK JOO HEUM [KR] ET AL) 30 September 1997 (1997-09-30) * column 3, line 9 - line 31; figure 2a * -----	1-5	
A	DE 31 06 604 A1 (SCHWARZENBERG WASCHGERAETE [DD]) 18 March 1982 (1982-03-18) * page 5, line 3 - line 6; figure 1 * -----	1-5	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) D06F
Place of search Munich		Date of completion of the search 18 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	

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EPO FORM 1503 03.92 (P04C01)

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

EP 11 18 1425

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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18-11-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6574996	B1	10-06-2003	NONE	

US 5671617	A	30-09-1997	CN 1138119 A	18-12-1996
			JP 2950773 B2	20-09-1999
			JP 8309081 A	26-11-1996
			US 5671617 A	30-09-1997

DE 3106604	A1	18-03-1982	DD 150357 A1	26-08-1981
			DE 3106604 A1	18-03-1982

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2009083365 A [0003]
- WO 2008119630 A [0004]