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(54) **A filter for washing machines**

(57) The present invention relates to a washing machine, comprising a washing tub (1); at least one waster discharge region (3) at the lower part of the tub (1); and at least one filter (2) provided at the inlet of the water discharge region (3). At the upper side of said filter (2) are provided a plurality of separating surfaces (6) with a

distance in between so low so as to permit to water passage only, and at the lower side (8) thereof (2) are provided a plurality of water-passage holes (5). Said filter (2) further comprises at least one elevating piece (7) for each separating surface (6), connecting the separating surface (6) to the lower side (8).

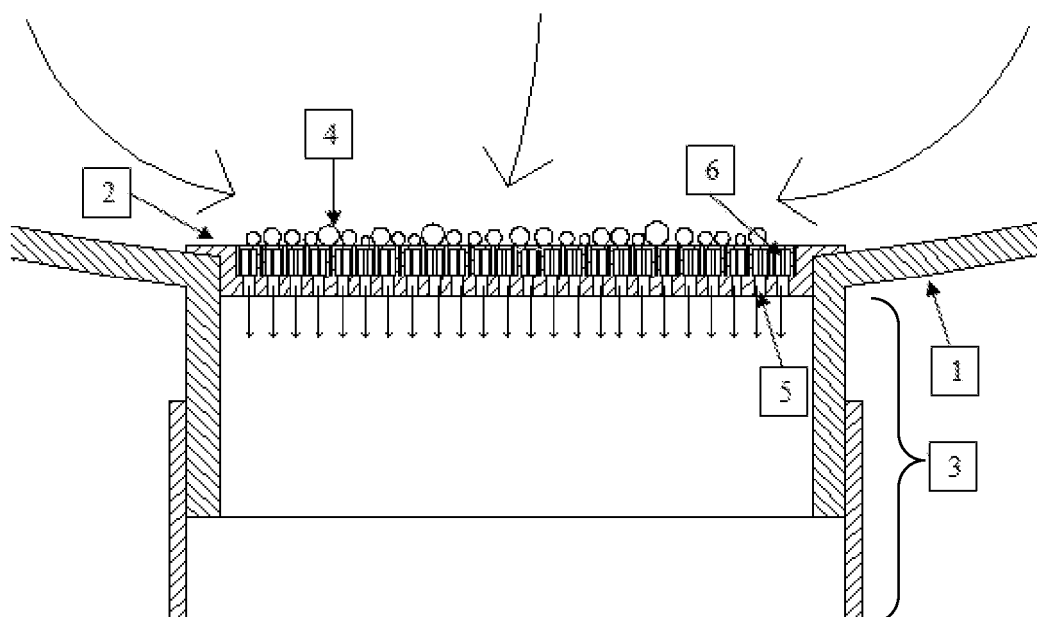


Figure – 2

Description

Technical Field

[0001] This invention relates to discharge-side filters used in washing machines or washers.

Prior Art

[0002] As known, washing machines are such type of machines which carry out laundering operations with powder detergents. Providing a complete dissolution of the powder detergent as a result of mixing it into the washing water of a washing machine is important in terms of both the hygiene of laundry being handled and the correct operation of the machine (due to powder anti-limescale agents added to the detergent). In these machines, powder detergents dissolved incompletely in the washing water accumulate at the bottom of the washing tub and are discharged through the waste water outlet during the first water removal/supplement operation. This, in turn, naturally leads to a waste of detergent and an inadequate cleaning of the laundry.

[0003] In the published patent application WO2009083365 according to the prior art are disclosed a water-floatable ball placed in a hole at the water discharge region of a washing machine and a stopper provided on this ball, preventing the ball from passing to the tub in order to prevent the discharge of undissolved detergent from the machine. According to said application, following water inlet into the machine, the ball rises up and blocks the stopper so that undissolved detergents cannot pass to the water discharge region. That application entails the risk, however, that some amount of undissolved detergent passes to the water discharge region in the time interval to elapse until the ball blocks the stopper at the moment when water is taken into the machine for the first time in a washing operation.

[0004] In another published patent application WO2008119630 according to the prior art is disclosed a mixer, which rotates in the tub of a washing machine to assist in dissolving the powder detergent in water by means of a drive it receives from the drum motor or from a separate motor. This solution, on the other hand, complicates the manufacture of washing machines and brings about cost increases.

Brief Description of Invention

[0005] The washing machine according to the present invention comprises a washing tub; at least one waste discharge region at the lower part of the tub; and at least one filter provided at the inlet of the water discharge region. All powder detergent particles present in an undissolved state in the tub clog the filter and since these particles cannot pass to the discharge region, they remain in the tub until they become dissolved.

[0006] At the upper side of the filter according to the

present invention are provided a plurality of separating surfaces with a distance in between so low so as to permit to water passage only, and at the lower side thereof are provided a plurality of water-passage holes. The filter further comprises at least one elevating piece for each separating surface, connecting the separating surface to the lower side.

[0007] Water is passed first through the separating surfaces and then through the water-passage holes and finally arrives at the water-discharge region. Meanwhile, any detergent particles accumulating at the separating surfaces are dissolved in time in the washing water present in the tub and so are used again.

Object of Invention

[0008] The object of this invention is to achieve a complete dissolution of powder detergents used in washing machines.

[0009] Another object of this invention is to achieve a complete dissolution of powder detergent prior to the first water discharge.

[0010] A further object of this invention is to prevent the passage of any undissolved powder detergent to the water discharge region.

[0011] Yet a further object of this invention is to embody a filter structure fulfilling the objects stated above.

[0012] Still a further object of this invention is to provide an easily-producible and inexpensive, reliable machine, meeting the aforesaid objects.

Description of Figures

[0013] The interior of an representative washing machine according to the present invention is illustrated in annexed figures briefly described hereunder.

Figure 1 is a front cross-sectional illustration of a tube and water discharge region of a washing machine according to the present invention.

Figure 2 is a front cross-sectional illustration of a filter and water discharge region according to the present invention.

Figure 3 is a perspective illustration of a different state of the filter.

Figure 4 is a perspective illustration of the details the filter.

[0014] The parts in said figures are individually numbered as following.

- tub (1)
- filter (2)
- water discharge region (3)
- detergent particles (4)
- water passage hole (5)
- separating surface (6)
- elevating piece (7)

lower part (8)

Description of Invention

[0015] The machine according to the present invention is a washing machine, and is developed to provide the dissolution of powder detergent mixed into the washing water and to prevent any undissolved power detergent from passing to the water discharge region. Figures 1 to 4 provide the details of the interior of a washing machine according to the present invention (the machine is not illustrated in its entirety).

[0016] Figure 1 is a front cross-sectional illustration of a tube (1), filter (2), and water discharge region (3) of a washing machine according to the present invention. As is known, a tub (1) is a part in which a washing drum (not illustrated in figures) is revolved and in which a washing operation is conducted. In the interior of the tub (1), in turn, is provided at least one discharge region (3) by which water used during laundering is drained out. When any washing cycle is completed, the water drained out (by means of pumps and/or valve arrangements not illustrated in figures) from the tub (1) is taken into this region (3) and then discharged out.

[0017] As is illustrated in figures 1 and 2, at the inlet of the water discharge region (3) is provided at least one filter (2) (preferably in the form of a plate), through which no undissolved powder detergent particle (4) can pass. In other words, all undissolved powder detergent particles (4) present in the tub (1) are retained at the filter (2) and since these particles cannot pass to the discharge region (3), they are kept in the tub (1) until they become dissolved.

[0018] As illustrated in figures 2 and 3, a plurality of separating surfaces (6) are formed on the upper side of the filter (2) to retain the detergent particles (4). Water is passed between these separating surfaces (6) (based on the distance between the surfaces (6)) and is then transferred through a plenty of holes (5) at the lower side (8) of the filter (2) to reach the water discharge region (3). Meanwhile, any detergent particles (4) accumulating at the separating surfaces (6) are dissolved in time in the washing water present in the tub (1) and so are used again.

[0019] Said filter (2) is structured so as to be easily attached and detached to/from the inlet of the water discharge region (3). Or, as illustrated in Figure 2, it may be attached in a tight-fit fashion. The important point here is that an easy mounting of the filter shall be advantageous in terms of the manufacture of machine.

[0020] As mentioned above and illustrated in Figure 3, many separating surfaces (6) are provided on the filter (2) and only water can pass through these surfaces (6). Additionally, in order to keep the surfaces (6) at a defined state, at least one elevating piece (7) is provided for each separating surface (6), connecting the separating surface (6) to the lower side (8) (Figure 4 illustrates only four of these elevating pieces). Thanks to these elevating

pieces (7), the separating surfaces (6) are maintained at a certain distance to the lower side (8) so that the water passing through separating surfaces (6) are easily arrived at the water passage holes (5) provided at the lower side (8).

Claims

1. A washing machine comprising a washing tub (1), at least one water discharge region (3) provided at the lower part of the tub (1), and at least one filter (2) provided at the inlet of the water discharge region (3), **characterized in that** a plurality of separating surfaces (6), with a distance in between so low so as to permit to water passage only, are provided at the upper side of the filter (2), and a plenty of water passage holes (5) are arranged at the lower side (8) of the filter (2).
2. The washing machine according to Claim 1, **characterized in that** at least one elevating piece (7) is provided for each separating surface (6), connecting the separating surface (6) to the lower side (8).
3. The washing machine according to Claim 1, **characterized in that** said filter (2) is in the form of a plate.
4. The washing machine according to Claim 1, **characterized in that** said filter (2) is detachable/attachable.
5. The washing machine according to Claim 1, **characterized in that** said filter (2) is attached to the inlet of the water discharge region (3) in a tight-fit fashion.

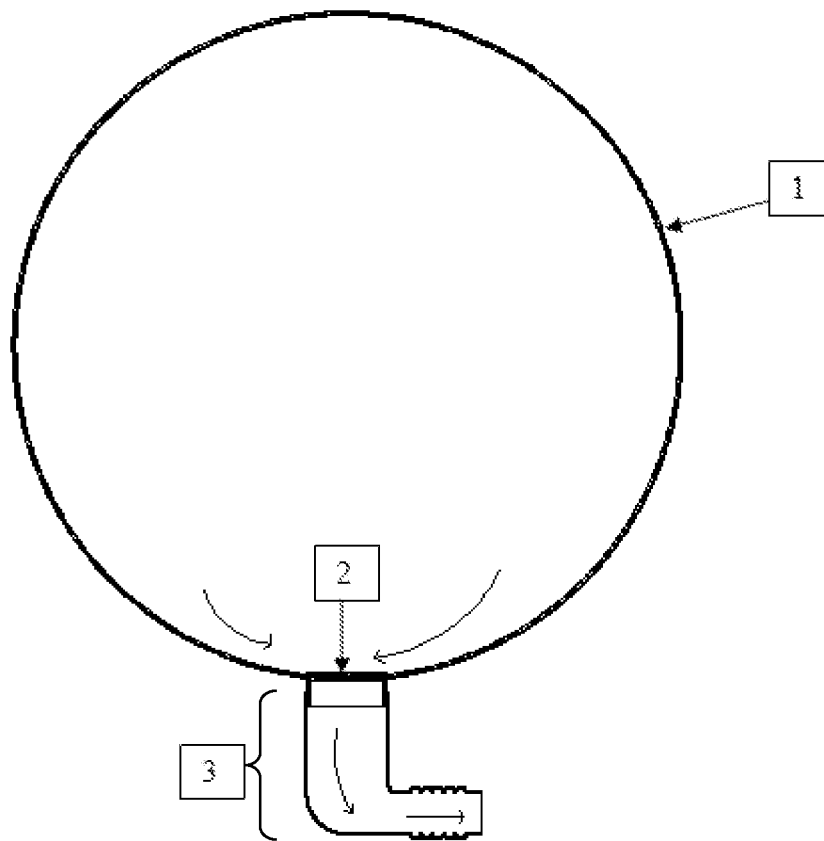


Figure – 1

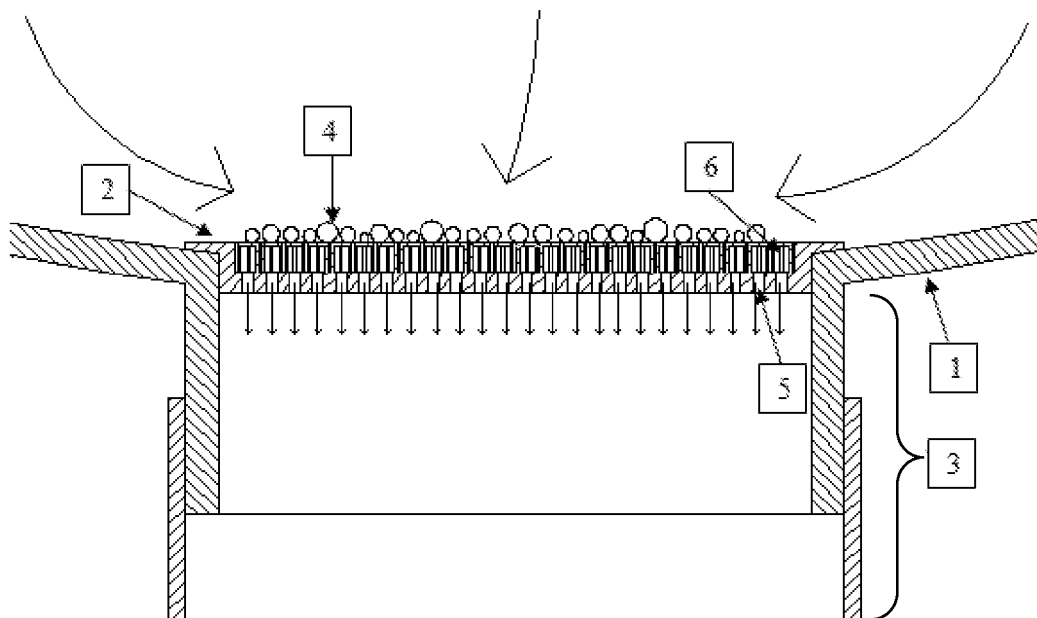


Figure – 2

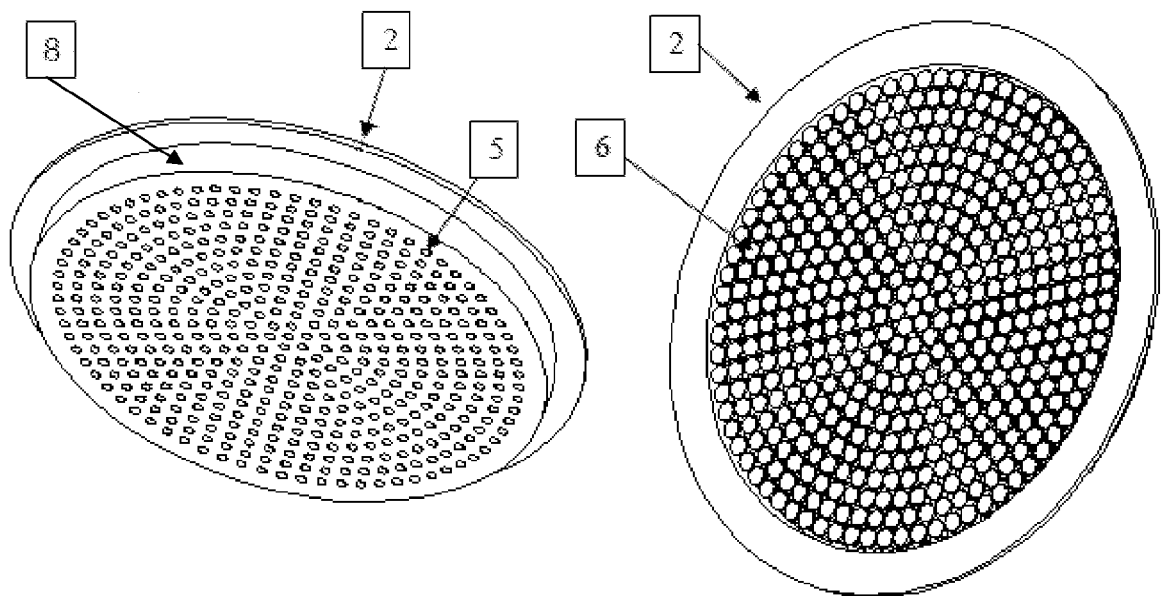


Figure – 3

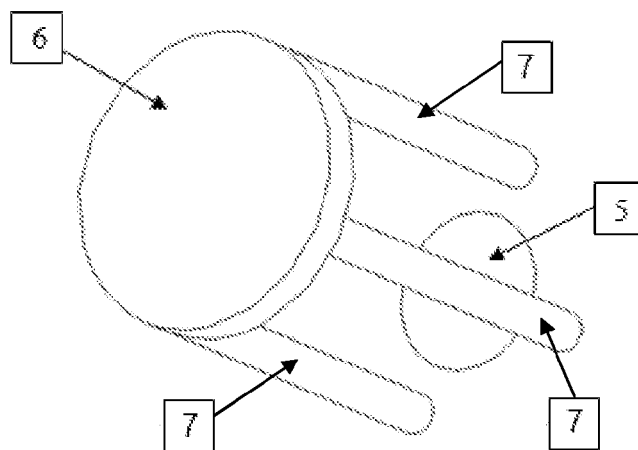


Figure – 4



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 1419

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	WO 2009/083365 A1 (ARCELIK AS [TR]; UNAL BARIS [TR]; OZTURK EMRE [TR]) 9 July 2009 (2009-07-09) * the whole document *	1-5	INV. D06F39/08
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A	WO 2007/068670 A1 (ARCELIK AS [TR]; OKUTAN OMER HAKAN [TR]) 21 June 2007 (2007-06-21) * the whole document *	1-5	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
Place of search		Date of completion of the search	Examiner
Munich		28 February 2012	Stroppa, Giovanni
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 03.82 (P04C01)

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

EP 11 18 1419

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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28-02-2012

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