

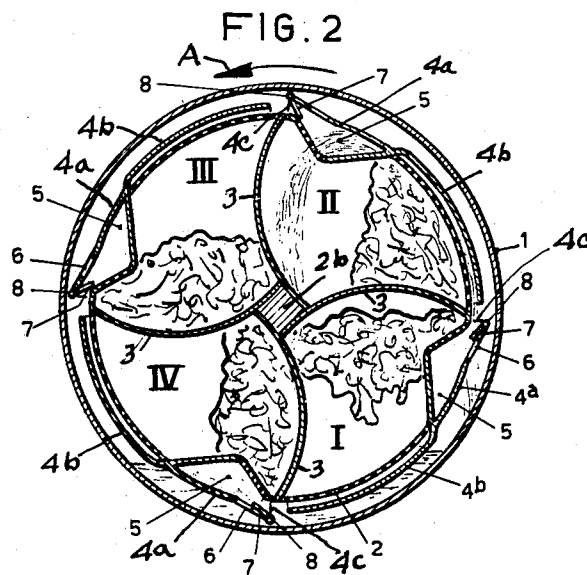
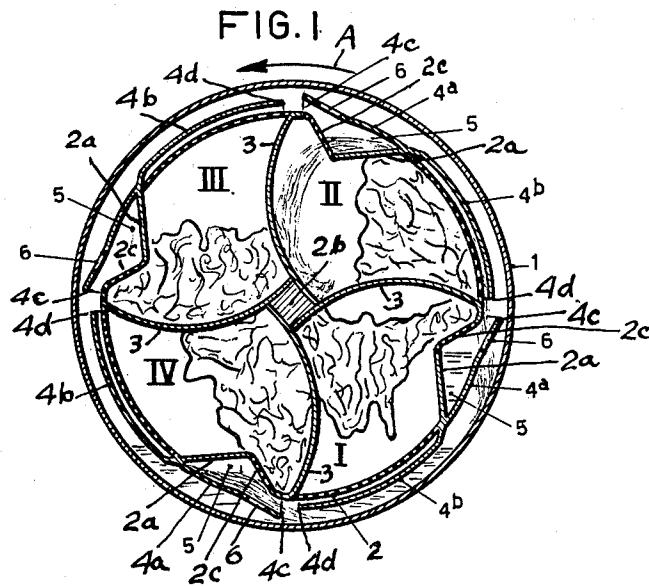
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TUMBLER TYPE WASHING MACHINES

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TUMBLER TYPE WASHING MACHINES

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3 Claims. (Cl. 68-143)

This invention relates to laundry washing machines and more especially to a washing machine of the tumbler type having an outer casing to receive a liquid and an inner partly perforated drum rotated on a horizontal axis and provided with blades or lifters extending toward or close to the shaft of the drum.

If the casing of such a machine is filled with liquid up to a level at which the lower segment of the rotating or oscillating drum is permanently immersed in the liquid, then the effectiveness of the operation depends upon the rate at which the liquid is alternately absorbed by and drained from the articles under treatment. This holds good not only for the washing operation proper, but also for the subsequent rinsing operation with clean water. Any increase of the amount of liquid absorbed by the articles and drained therefrom during one complete revolution of the drum, i. e. any increase of the velocity at which the liquid is "transported," means a reduction of the time during which the articles are to be treated in the machine and, consequently, increased economy.

In washing machines of the types hitherto in use the "transporting velocity" of the liquid is relatively low. The drum of a machine of this type is ordinarily caused to rotate alternately clockwise and anticlockwise during a few revolutions, although it is sometimes driven in one direction only. Assuming now the drum to rotate in anticlockwise direction, then the articles to be washed or rinsed, initially accommodated in the lower portion of the drum so as to absorb fresh liquid from the casing, will be lifted by the blade on the left hand side of the articles and thereby moved to the right up to a height at which they tumble over the edge of said blade and fall back. In the meantime, fresh liquid will flow into the then empty lower segment of the drum, so that said articles fall into a pool of fresh liquid before any considerable amount of spent liquid has been drained therefrom, the consequence being that they can absorb only a small amount of fresh liquid.

It is an object of the invention to intensify the absorption of liquid by, and the removal thereof from the articles so as to increase the "transporting" velocity of the liquid, i. e. to reduce the washing time.

It is a further object of the invention to constitute a washing machine wherein the perforated portion of the drum is covered on the outer side by hoods having substantially the shape of segments of a cylinder, each hood engaging the drum along one axial edge but being open along the opposite axial edge thereof.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings, wherein like reference characters indicate like parts through the several figures and in which:

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Figure 1 is a vertical cross-section of the washing machine, and Figure 2 is a view, similar to Figure 1, showing a modified form of the washing machine.

Referring now to the drawing, and more specifically to Fig. 1, the washing machine comprises a casing 1 and a drum 2 supported for horizontal rotation upon a central shaft 2b. The drum is divided into four compartments, I, II, III, and IV, which are separated by partitions 3 extending from the shell of the drum to the shaft 2b thereof. The arrow A indicates the direction wherein the drum is to be driven. Each partition 3 is concave as seen in the direction of rotation and so formed that each compartment has a relatively wide leading portion and a relatively narrow following portion.

Secured to the shell portion of each compartment, on the outer side thereof and along a generatrix substantially centrally between the axial edges of said portion, are two curved plates 4a, 4b extending, concentrically with the shell, in forward and in rearward direction, respectively, so as to form two hoods, which are open on the front side and on the rear side, respectively. The segmental parts of the shell covered by hood 4a are indented to define, together with the hood, an enlarged pocket 5. The indented portions include an imperforate rear portion 2a and a perforate forward portion 2c.

The articles accommodated in the wider portion of the compartment I fall into the narrower portion thereof, and hood 4b prevents liquid in the casing from flowing into said narrower portion, so that the articles therein are adapted to yield a considerable part of the spent liquid absorbed thereby, said liquid returning to the casing owing to the suction created by said hood. The pocket 5 of the compartment under consideration has partly been filled with fresh liquid during the time wherein its hood 4a, acting as a scoop, previously moved through the fresh liquid in the casing. During further rotation of the drum, the fresh liquid in the pocket 5 is discharged through the perforate portions 2c onto the articles, which thereby absorb a considerable amount thereof, until the compartment again assumes the position shown in Fig. 1 and the described cycle is repeated.

To prevent the spent liquid discharged by the suction hood of compartment II from flowing for the greater part into the pocket of compartment I, the free marginal portion 4c of the plate 4a is bent radially outwards so as to radially project with respect to the free marginal portion 4d of the plate 4b. In addition, it is provided with an axial slot 6 adapted to divert the spent liquid discharged by the hood 4b to the liquid space of the casing and thus to cause it to by-pass the pocket 5. Besides, said outwardly bent marginal portion 4c of the plate 4a intensifies the scooping action of said plate.

Fig. 2 illustrates a machine similar to the one shown in Fig. 1, it being understood however that the hood 4a of each compartment has a flap valve 7 hinged at 8 to its free edge 4c and adapted to close the mouth of the pocket 5 of the corresponding compartment whenever said pocket is in position to discharge the fresh liquid therein, through its perforated wall, into said compartment; see the position of said flap valves 7 corresponding to compartments II and III.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except in so far as is necessitated by the prior art and by the spirit of the appended claims.

What I claim is:

1. A washing machine comprising a stationary casing having a horizontal shaft, a shell mounted within the casing for rotation in one direction about said shaft, said shell being subdivided into a plurality of segmental com-

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partments by partitions which are concave in cross-section as seen in the direction of rotation of the shell, said partitions extending from the shell inwards to the shaft, the shell segment of each compartment being covered by two spaced scoops extending in opposite circumferential direction to constitute a leading scoop and a trailing scoop, each compartment comprising individual portions defined by spaced apertures in the shell segment thereof, and the free edge of the leading scoop of a compartment projecting outwards in radial direction from the axis of the shaft relative to the free edge of the trailing scoop of the same compartment. 5

2. A washing machine as set forth in claim 1 wherein the shell segment of one portion of each compartment has an inwardly depressed pocket extending axially thereof, with one portion of the pocket being impervious while the remaining portion of the pocket nearest the edge of the scoop being pervious. 10 15

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3. A washing machine as set forth in claim 1 wherein a flap valve is hinged along each of the free edges of the leading scoops so as to close and open said scoops during the rotation of the shell.

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