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 DEVICE FOR INTRODUCING LAUNDERING-AID
 IN CLOTHES WASHING MACHINES
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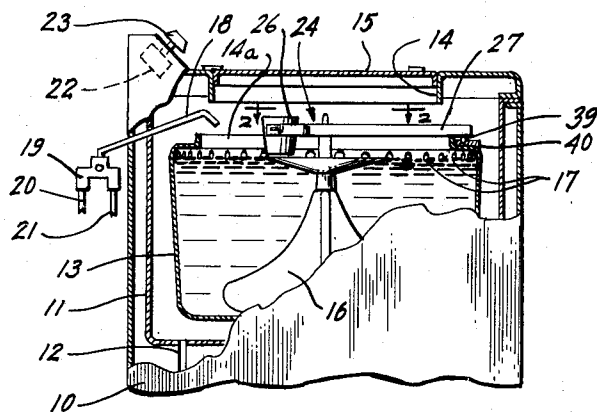


FIG. 1.

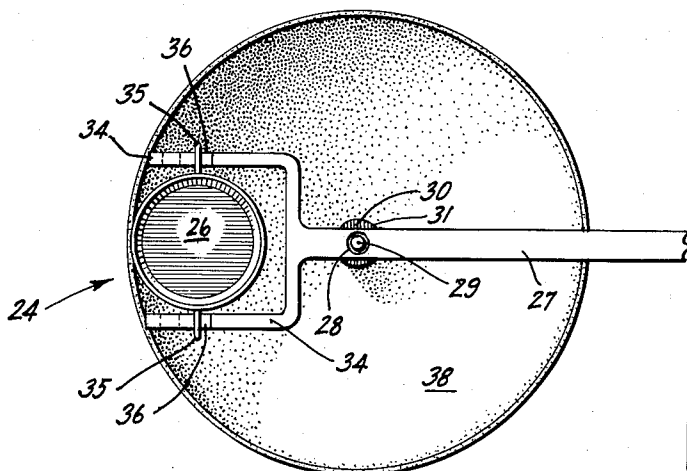


FIG. 2.

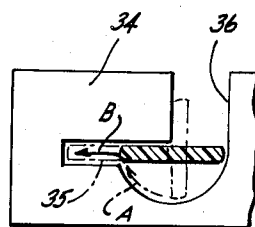


FIG. 4.

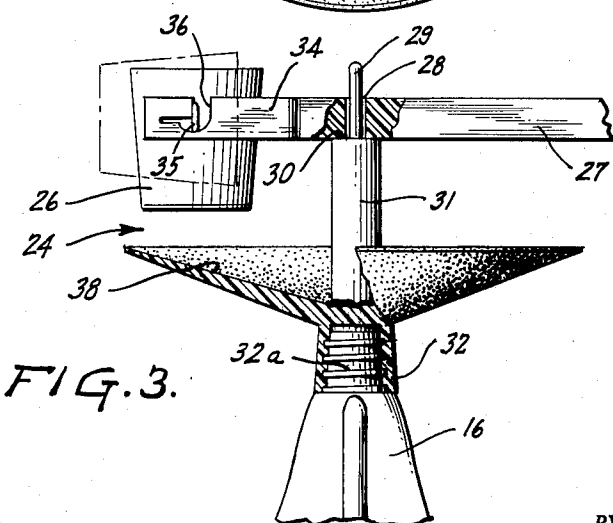


FIG. 3.

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DEVICE FOR INTRODUCING LAUNDERING-AID
IN CLOTHES WASHING MACHINES

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9 Claims. (Cl. 68—17)

The present invention relates to laundering apparatus, and particularly to clothes washing machines of the type which automatically function first to wash clothes in water contained in a washing basket, then to extract the wash water from the clothes and basket, thereafter to rinse the clothes in water freshly supplied to the basket, and finally to extract the rinse water from said clothes and basket.

In machines of the above mentioned general variety, better cleaning of the clothes is obtained when laundering-aid material is added to the water, and it is desirable that the laundering-aid material be introduced into the clothes basket at the proper point in the cycle. Accordingly, it is an object of the present invention to provide an improved device for use with an automatic washing machine, which device is adapted to dispense such material automatically and in predetermined relation to the initiation of the proper function of the machine.

While the device of the present invention can be employed to dispense various kinds of laundering-aid materials at different selected times in the sequence of the machine's operation, it is preferred to utilize the device for dispensing a rinse-agent, for example, a water-softening liquid or solution, to be added to rinse water during the clothes-rinsing function of the machine.

It is therefore a further object of this invention to provide an automatic washing machine with a simplified device adapted to receive and retain a charge of rinse-agent during the washing operation of the machine, and to dispense said agent automatically after the wash water has been extracted from the clothes and expelled from the machine, and when fresh water again fills the machine for the rinsing of the clothes therein.

A characteristic feature of the invention resides in the fact that the improved device consists of few inexpensively made parts which can readily be associated together for mounting on and removal from an automatic washing machine without requiring material changes in the machine and without affecting the normal operation thereof.

In accordance with a preferred embodiment, the device of this invention includes a container which is swingably suspended to tilt within the confines of the washing and spinning basket from a vertical or material-retaining position to a horizontal or material-pouring position. Movement of the container to pouring position occurs as a result of centrifugal force generated by displacement of the material in the suspended container in response to spinning of the basket to effect extraction and ejection of wash water from the clothes and basket. The device also includes means for locking the container in horizontal position and preventing said container from gravitating to its vertical position. In this manner, upon cessation of the spinning operation, rinse-agent material retained in said container is free to run outwardly thereof. In order to prevent the rinsing-agent material from entering the clothes-retaining basket until water in the latter reaches a predetermined level, the device of the invention

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advantageously includes a shallow receptacle disposed beneath the container to catch the material pouring therefrom. Water which fills the machine basket enters said receptacle and mixes with the rinsing-agent material therein, the mixture then overflowing into the basket for rinsing the clothes.

The full nature of the invention and the manner in which its objects and advantages are achieved, will be fully understood from the following description taken in conjunction with the accompanying drawings, in which:

Figure 1 is a side view, partly in elevation and partly in section, illustrating a portion of a clothes washing machine with which is associated a dispenser device embodying the invention;

Figure 2 is an enlarged top plan view of the dispenser device illustrated in Figure 1, looking in the general direction of arrows 2—2 thereof;

Figure 3 is a side view of the device as shown in Figure 2, with portions broken away; and

Figure 4 is a fragmentary view, on a larger scale, illustrating certain operational features of the device of this invention.

With more particular reference to the drawing, Figure 1 illustrates those elements of an automatic clothes washing machine which are necessary for an understanding of the invention. The machine itself is of known type which includes an outer casing or cabinet 10 adapted to house a fixed tub 11 which is provided with a drain outlet 12 and which encloses a rotatable washing and spinning basket 13. The cabinet has an open top portion 14 which is provided with a hinged cover 15 to give access to the open upper end 14a of said basket.

In a machine of this type, clothes are placed in the basket 13 and are washed, rinsed and spun dried therein. The clothes are washed by action of a bladed agitator structure 16 which is driven to oscillate back and forth within the basket while the latter is held stationary, and water is extracted from the clothes and ejected from the basket by accelerated rotation of the basket and agitator in one direction about a generally vertical axis. The basket is imperforate except for overflow ports or apertures 17 which determine the normal level of the water in the basket and provide for escape of the water during spinning of the basket. Water is introduced within the basket through an inlet nozzle 18 controlled by means of a suitable conventional solenoid-operated mixing valve 19 which is connected with conduits 20 and 21 for supplying hot and cold water. A timer-operated control 22 having a setting knob 23 is provided to effect operation of said valve 19, as well as to govern the automatic function of the machine through its schedule of washing, rinsing, and water-extracting operations.

The solenoid valve and the timer-operated control are commercial items which are well known in the art and to which no claim of invention is made herein. These items therefore have been conventionally represented in the drawings. Likewise the driving and coupling mechanism which provides for activation of the agitator in the basket and which also provides for rotation of the agitator with the basket in the manner previously noted, is commonly known in the art and has not been illustrated. Briefly stated the timer-operated control and the driving and coupling mechanism, as is generally known in the art, function to drive the agitator and basket in the following manner: after the basket 13 is filled with water to a level predetermined by the apertures 17, the agitator structure 16 is oscillated with respect to the basket to effect washing of the clothes; at the conclusion of the washing cycle, the basket and agitator structure are rotated in unison at high speed for the purposes of centrifugally extracting the water from the clothes and expelling the water from the basket through the apertures

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17; after this extraction, high speed rotation of the basket and agitator structure ceases, the basket is filled with a fresh supply of water and the agitator is again oscillated in the basket to effect rinsing of the clothes; finally, following the rinsing cycle, the basket and agitator structure are once more rotated at high speed for a period of time sufficiently long to extract the rinse water and spin-dry the clothes.

In particular accordance with the present invention, the washing machine is provided with a dispenser device indicated generally at 24. This device comprises a container 26 for receiving and containing laundering-aid material, for instance a liquid rinsing agent, and adapted to empty its contents into the basket 13. As represented in Figure 3, the container 26 is mounted to pivot from a dangling position to a tilted position and, for that purpose, said container is hingedly suspended on a support in the form of an elongated arm 27 which is freely mounted in a generally horizontal position on the upper end portion of the agitator structure and at the open top 14a of the basket 13. As clearly seen in Figures 2 and 3, the intermediate portion of the container-supporting arm 27 is provided with a bore 28 adapted to fit loosely over a pin 29, said arm resting on a shouldered portion 30 of an upstanding post 31. This post is connected by means of an internally screw-threaded portion 32 with the upper end portion of agitator shaft 32a to form an extension thereof.

One end of the arm 27 terminates with a bifurcated portoin defining a pair of parallel bars 34 on and between which the container 26 hangs. Confronting portions of said bars and container have interengageable means providing fulcrum points for pivotal movement of said container from vertical or liquid-retaining position, that is the position shown in full lines in Figure 3, to horizontal or liquid-pouring position, that is the position represented in broken lines in said Figure 3. As best seen in Figures 2, 3 and 4, the mentioned interengageable means take the convenient form of a bayonet-slot type connection consisting of a pair of flattened fingers 35 projecting from diametrically opposite sides of the container 26, and a pair of right-angular slots 36 on the bars 34 to receive said fingers which normally occupy the vertical part of said right-angular slots. This vertical part of each of said slots is such that the fingers 35 are free to swing from vertical position to horizontal position, as illustrated by arrow A in Figure 4, and the remaining or horizontal part of said slots in such that the flattened fingers can slide into engagement with said horizontal part of the slots, as is represented by arrow B in said Figure 4.

In use, the device 24 is attached to the agitator shaft 32a in the manner hereinbefore described and shown in Figure 3. Before or during filling of the basket 13 with water preparatory to washing the clothes, a measured quantity of a rinse-agent liquid or solution is poured into the container 26. It will be appreciated that because the arm 27 is loosely mounted on the post 31, back and forth movement of the agitator during washing operation of the machine does not affect the container 26 so that the rinse-agent remains in said container.

Following the washing operation, the arm 27 and container 26 thereon will rotate at high speed with the spinning of the basket and agitator structure to extract and expel the washing water. To insure rotational movement of the arm 27, the latter can be provided with means for interconnecting said arm 27 and basket 13. For that purpose, and as seen in Figure 1, the arm 27 has a pin or projection 39 adapted for engagement with a keeper 40 on the basket 13, so that said arm is positively driven by the spinning basket. Due to centrifugal action resulting from this high speed rotation, the rinse-agent within the container 26 develops a force which causes said container to tilt from its vertical position to its horizontal position, whereupon the flattened fingers 35 align themselves with the horizontal part of the slots 36 and slide

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into engagement therewith. In this manner the container becomes locked in horizontal or pouring position but, as long as the high speed rotation continues, the rinse-agent does not run out of the container but is retained therein by centrifugal action.

When high speed rotation ceases, the rinse-agent is then free to flow out of the container 26, since the latter is maintained in pouring position by means of the fingers 35 which remain in engagement within the horizontal part of the slots 36. However it is desirable that the rinse-agent be prevented from entering the clothes-containing basket until the latter is filled with water. For that purpose a shallow receptacle 38 is provided on the post 31 and extends radially therefrom to underlie the pivotal container 26. With this arrangement, when the rinse-agent is free to flow out of the tilted container, the shallow receptacle 38 intercepts and retains said rinse-agent until water rising in the basket 13 enters into said receptacle and mixes with the rinse-agent therein, the mixture being then discharged into said basket as the agitator oscillates back and forth for rinsing the clothes.

If desired a washing aid, such as soap or detergent, can be placed in the receptacle 38 before the machine starts its washing operation. In this manner it is possible to effect automatic addition of washing aid to the wash water as the latter rises in the basket 13 and flows into said receptacle to mix with said washing aid.

After each use, the container 26 can be manually pushed so as to disengage the fingers 34 thereby allowing said container to gravitate back to its normal vertical or liquid-retaining position and made ready for subsequent use. The entire device 24, or the container 26 alone, can be readily removed from operating position so that said device or container can be thoroughly cleaned after use, as desired.

From the foregoing description, it will be appreciated that the present invention provides an inexpensive and simplified arrangement which utilizes functions of an automatic clothes-washing machine to effect automatic addition of laundry-aid material to water which fills the clothes-containing basket. While a preferred embodiment has been shown and described, it is to be understood that the invention embraces such changes and modifications as may come within the scope of the subjoined claims.

What I claim is:

1. For use with a clothes washing machine provided with a basket adapted to spin at centrifuging speed; a device for automatically introducing laundering-aid material into said basket, comprising a container for said material, means for pivotally suspending said container to spin with said basket in such manner as to swing from material-retaining position to material-discharging position in response to spinning of said basket, and means for releasably maintaining said container in said discharging position to discharge said material for mixture with water in said basket after termination of said spinning.

2. For use with a clothes washing machine provided with a basket adapted to spin about a central axis; a device for automatically introducing laundering-aid material into said basket, comprising a container for said material, means for pivotally suspending said container to one side of said axis and for establishing a drive connection between said container and basket whereby said container spins with said basket and thereby swings from material-retaining position to material-discharging position, and means for releasably maintaining said container in said discharging position to discharge said material for mixture with water in said basket upon termination of said spinning.

3. For use with a clothes washing machine provided with a basket adapted to spin for extracting water from the clothes between a washing operation and a rinsing operation; a device for automatically introducing a rinsing

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agent liquid into said basket, comprising a container for said liquid, means for pivotally suspending said container to spin with said basket in such a manner as to swing from liquid-retaining position to liquid-pouring position in response to spinning of said basket, and means for releasably maintaining said container in said pouring position to discharge said liquid for mixture with water in said basket after termination of said spinning.

4. A device as set forth in claim 3, in which a receptacle is disposed adjacent the mentioned container to receive the mentioned material discharged therefrom, said receptacle being located for submersion.

5. For use with a clothes washing machine provided with a basket adapted to rotate at centrifuging speed; a device for automatically introducing a rinsing-agent liquid into said basket, comprising a container for receiving said liquid, means for pivotally suspending said container to one side of the axis of rotation of said basket and for interconnecting said container and basket to effect swinging of said container from a vertical liquid-retaining position to a horizontal liquid-pouring position in response to the spinning of said basket about said axis, and means for releasably maintaining said container in said horizontal position upon cessation of said spinning to empty said member of its contents for mixture with water in said basket.

6. A device as set forth in claim 5, in which a shallow receptacle is disposed beneath the mentioned container to receive the rinsing-aid liquid therefrom, said shallow receptacle being located at a level to be submerged in water within said basket to provide for mixture of said liquid with water and for discharge of the mixture into the basket during the rinsing operation.

7. For use with a clothes washing machine which provides for successive operations including a washing operation, an extraction operation and a rinsing operation, and which is provided with a basket adapted to contain water and an agitator structure including a shaft mounted for agitating movement with respect to said basket during said washing and rinsing operations and for rotation with said basket during said extraction operation; a device for containing laundering-aid material to be mixed with and

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added to the water in said basket, said device comprising an arm mounted on and disposed cross-wise with respect to said shaft, one end of said arm terminating with a bifurcated portion, a container hingedly suspended on said bifurcated portion to swing from material-retaining position to material-discharging position in response to said rotation, and interengageable means between said bifurcated portion and said container to lock the latter in said discharging position.

8. In an automatic clothes washing machine wherein a water extracting operation is followed by a clothes rinsing operation, the combination of a clothes-containing basket adapted to spin for water extracting operation and adapted to be filled with water for clothes-rinsing operation, an agitator structure mounted within said basket and including a shaft disposed centrally of said basket, an arm freely mounted on said shaft and extending at right angles with respect thereto, means for imparting the spinning motion of said basket to said arm, one end portion of said arm terminating with a pair of bars each having an angular slot consisting of a vertically extending portion and a horizontally extending portion, a container having laterally extending projecting flattened fingers in engagement with the vertically extending portion of said slots to support said container in a position to retain rinsing-agent liquid during a washing operation and to swing for engagement with the horizontally extending portion of said slots to maintain said container in liquid-pouring position in response to spinning of said arm.

9. The combination as set forth in claim 8, in which a shallow receptacle is disposed beneath the mentioned container to receive the liquid poured therefrom and to retain said liquid until water in the mentioned basket reaches a level to flow into said receptacle for mixing with the rinsing-agent liquid therein.

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