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METHOD OF WASHING

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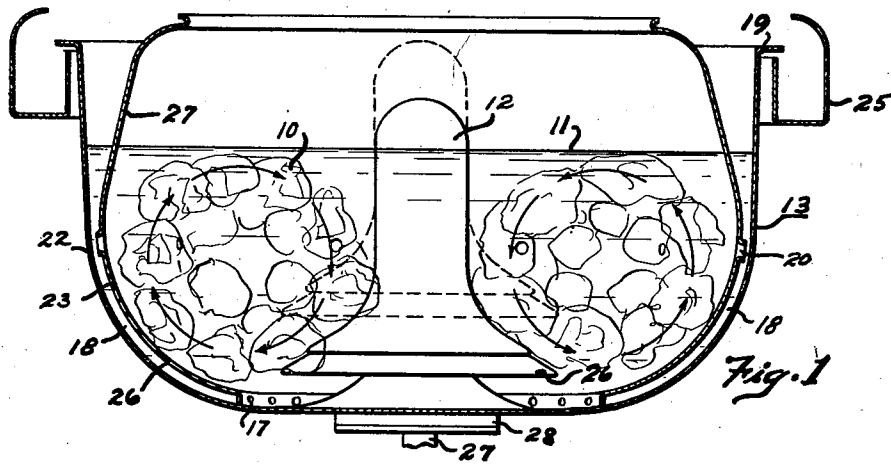


Fig. 1

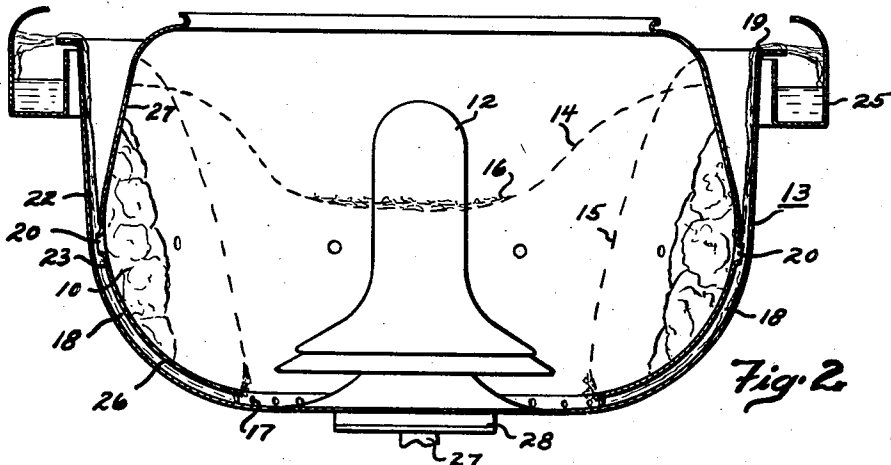


Fig. 2

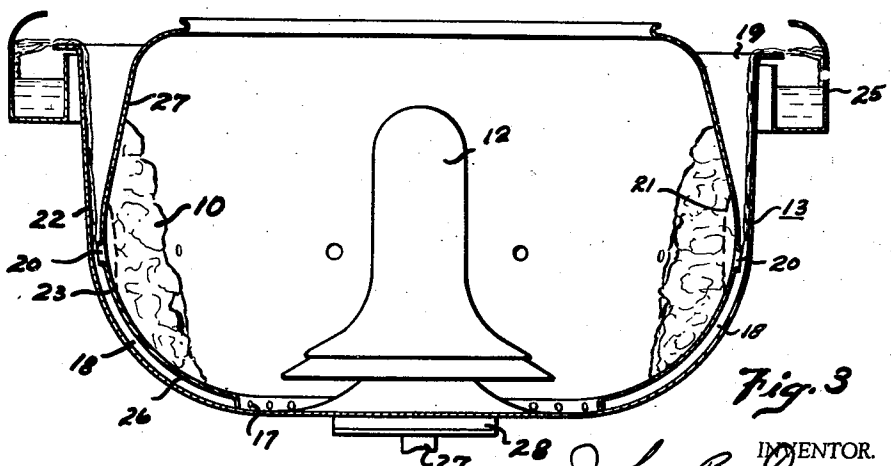


Fig. 3

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METHOD OF WASHING

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Application May 17, 1940, Serial No. 335,748

2 Claims. (Cl. 8—158)

This invention relates to domestic appliances.

An object of this invention is to prevent the deposit of scum floating on cleansing fluid upon articles to be cleansed while said cleansing fluid is being removed from said articles.

This invention is particularly applicable in the case of a clothes washing machine in which the cleansing fluid and the clothes, or other articles to be cleansed, are placed inside of a rotatable tub for the purpose of washing them by agitation of the clothes and fluid during a washing operation and for the purpose of partially drying the clothes by rotation of the tub to centrifuge the cleansing fluid from the clothes. In apparatus of this type, scum floating on the cleansing fluid generally is deposited on the clothes as the centrifugal operation proceeds, which leaves the clothes in an objectionable condition. This invention is directed to the prevention of such deposit of scum on the clothes.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a diagrammatic representation of an apparatus with clothes and fluid during the washing operation;

Fig. 2 is a diagrammatic representation of said apparatus indicating an initial and secondary stage of fluid removal from the clothes and indicating how the scum is removed from the apparatus before it has had an opportunity to deposit on the clothes; and

Fig. 3 is a diagrammatic representation of the final fluid removal from the clothes.

In practicing this invention, articles to be cleansed, such as clothes 10, are placed within a body of cleansing fluid 11, held within the tub 13. The fluid may be wash-water or rinse-water. The clothes and fluid are agitated preferably near the center of the body of fluid by means of an agitator 12, which may be of either the reciprocating type or oscillating type. The arrangement is such that the clothes and fluid may be agitated to distribute the clothes about the central vertical axis of the body of fluid, as indicated in Fig. 1, and thereafter the fluid and clothes are rotated about this vertical axis to produce a vortex in said fluid in which scum floating on the fluid is accumulated, as indicated in Fig. 2, where the initial stage of the vortex is indicated by the dotted line 14 while a later stage of the vortex is indicated by the line 15.

When the vortex is initially formed, at 14, the scum floating on the cleansing fluid tends to float to the central portion 16 of the vortex. This scum is removed from the vortex before the final stages of fluid removal in such a manner that the scum is prevented from depositing on the clothes. To this end, a skimming device is provided in the tub 13 adjacent the lower central portion of the vortex. This skimming device takes the form of an annular outlet or annular row of outlets 17 connected by the passageway or passageways 18 with the discharge rim 19. The outlet means 17 is of substantially greater capacity than the final outlet means 20, so that a substantial portion of the cleansing fluid, together with the scum 16 is removed at 17, before the final stages of centrifuging take place. During the initial centrifugal action, the clothes 10 arrange themselves along the vertical periphery of the tub 13 as indicated in Fig. 2, and the scum is removed at 17 before it has a chance to deposit on the clothes 10.

After the scum and portions of fluid have been removed at 17, the centrifugal action is continued so that portions of the remaining cleansing fluid are removed at 20, in the manner indicated in Fig. 3. The remaining fluid which can be removed from centrifugal action is designated diagrammatically by the dotted line 21 for the purpose of indicating that the last remaining portions are being removed through the outlet 20.

Any suitable type of construction capable of accomplishing the foregoing action may be used. Preferably I use a tub comprising an outer casing 22 and an inner casing 23 so arranged that a liquid discharge passage 18 is formed between the casings. Outlet means 17 and 20 connect the inside of the inner casing 23 with the outlet passage 18. With this construction, the cleansing fluid is retained in the tub 13 as long as the tube is stationary; but upon rotation, fluid flows through the outlet means 17 and 20 into the passage 18 and is discharged at the rim 19 into the trough 25. The capacity of the outlet means 17 is sufficient to remove the scum 16 and a portion of the cleansing fluid before there is opportunity for the scum to be deposited on the clothes. The discharge capacity of outlet means 17 and 20 are therefore so proportioned that while outlets 17 and 20 start to discharge liquid simultaneously, a substantial discharge of scum and liquid takes place at 17 before the surface of the vortex reaches the clothes.

The inner casing 23 preferably is rounded at the bottom, as indicated at 26, and rounded or

inwardly flared at the top, as indicated at 27 to direct the clothes to the outer vertical periphery during the centrifuging action, as indicated in Fig. 2.

The agitating means 12 preferably is centrally located and is movable independently of the tub and while the tub is stationary. I prefer to use a vertically reciprocable agitator having more or less the shape of a cone with a flexible, rubber-like rim 26 although any other type may be used, such as a vaned agitator oscillatable about a vertical axis, as is well understood. This agitator is reciprocated or oscillated by means of the shaft 27, but preferably has imparted thereto a series of quick short strokes so that the water and clothes are given a toroidal motion as indicated in Fig. 1. With the usual tub of about 20 gallon capacity, the stroke is about one and one-half inches in length, and about 400 strokes per minute are imparted to the agitator.

The shaft 27 is oscillatable or vertically reciprocable within an outer rotatable shaft 28, which is secured to the tub 13. Suitable mechanism is provided for rotating the shaft 28 after the washing operation has been completed. Driving mechanism for the shafts 27 and 28 is well-known, and is therefore not further described herein. A suitable mechanism for accomplishing this is disclosed in my copending application Serial No. 269,594, filed April 24, 1939, of which this application is a continuation in part. Reference is hereby made, if necessary, to said application for further disclosure.

The control of the washing operation and centrifuging operation may be manual or automatic. If automatic, the same may be accomplished by the automatic controls disclosed in my said copending application Serial No. 269,594.

During the washing action, a certain amount of fluid is forced out of casing 23 through openings 17 and returns through opening 20. Scum forming ingredients carried by such fluid can thus rise into the quiescent fluid in pocket 28 where some of the scum may thus float and be preliminarily separated in an outer zone. It is discharged from the apparatus as soon as cen-

trifugal action takes place without danger of deposit on the clothes. Thus a portion of the scum-forming substance is removed by this method.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. The method of washing articles in a container which comprises agitating a body of cleansing fluid and articles to be cleansed whereby the cleansing fluid is forced outwardly from the central axis along the bottom wall of the container and inwardly towards the central axis at the surface thus causing the scum to collect at the center of the container and then with the scum collected at the center rotating said body of the cleansing fluid and articles about said central axis at a sufficient speed to create a vortex in said body of fluid at the bottom of which said scum is accumulated, removing fluid and scum from the lower portion of said vortex, and centrifuging portions of remaining cleansing fluid from said articles.

2. The method of washing articles in a container which comprises agitating a body of cleansing fluid and articles to be cleansed whereby the cleansing fluid is forced outwardly from the central axis along the bottom wall of the container and inwardly towards the central axis at the surface thus causing the scum to collect at the center of the container and then with the scum collected at the center rotating said body of the cleansing fluid and articles about said central axis at a sufficient speed to create a vortex in said body of fluid at the bottom of which said scum is accumulated, removing fluid and scum from the lower portion of said vortex, centrifuging portions of remaining cleansing fluid from said articles, confining the removed fluid and scum from the cleansed articles, and causing flow of the fluid and scum upwardly by centrifugal force.

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