

Feb. 21, 1967

J. A. SCHWING

3,304,751

LAUNDRY APPARATUS

Filed Dec. 16, 1964

2 Sheets-Sheet 1

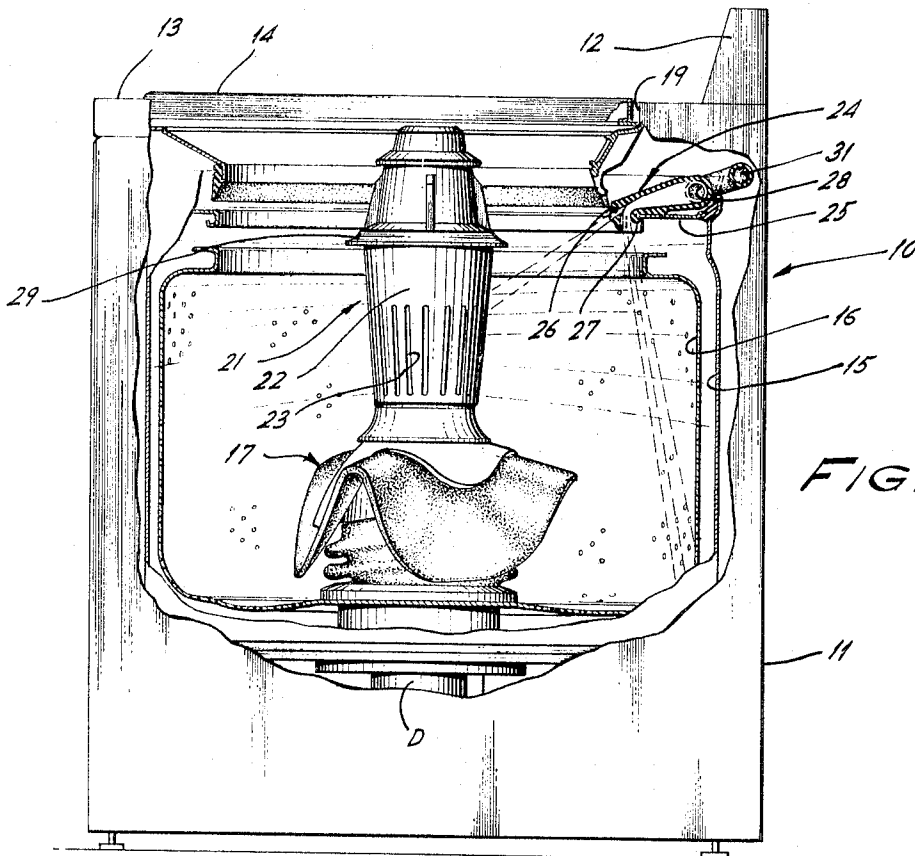


FIG. 1.

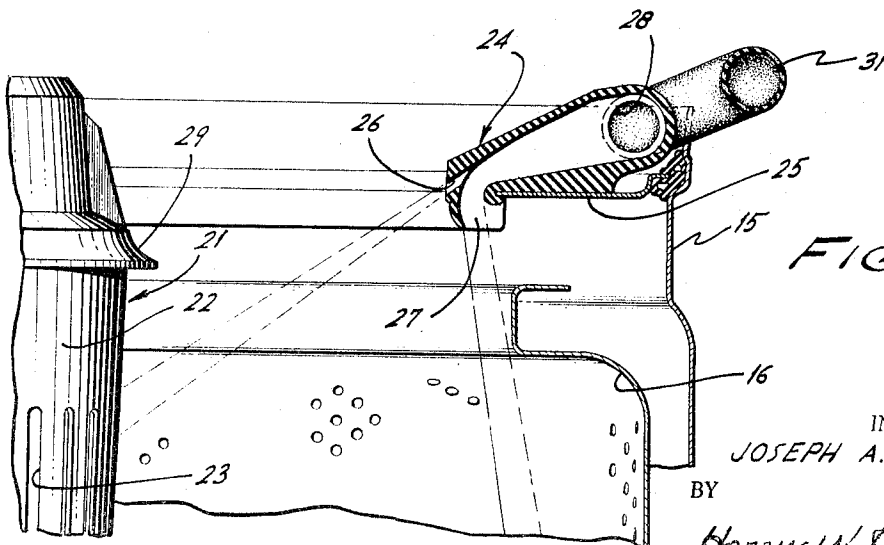


FIG. 2.

INVENTOR.
JOSEPH A. SCHWING

BY

Harry W. Rargis III
AGENT

Feb. 21, 1967

J. A. SCHWING
LAUNDRY APPARATUS

3,304,751

Filed Dec. 16, 1964

2 Sheets-Sheet 2

FIG. 3.

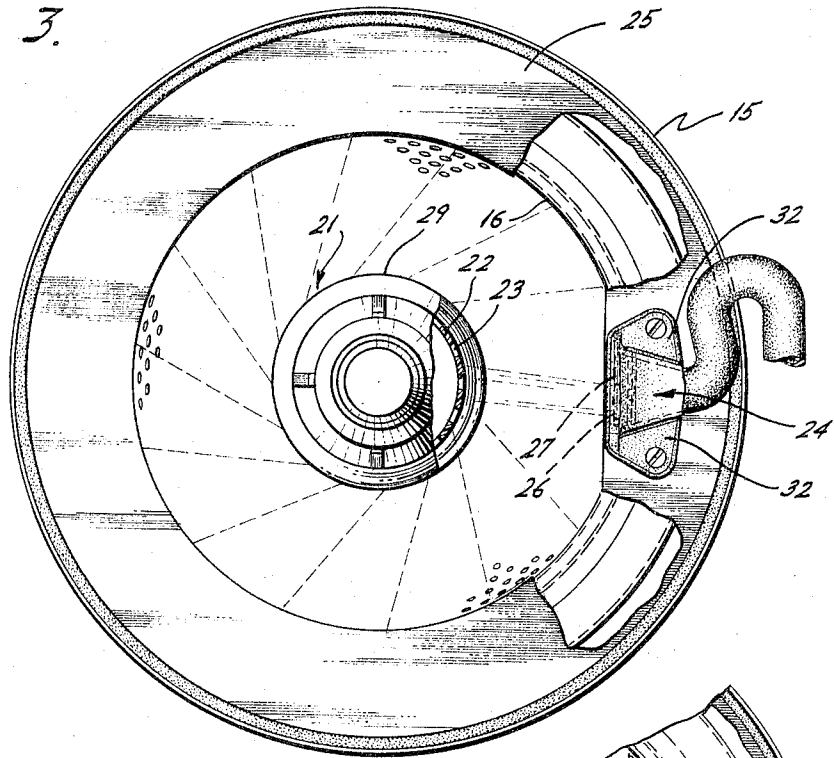


FIG. 5.

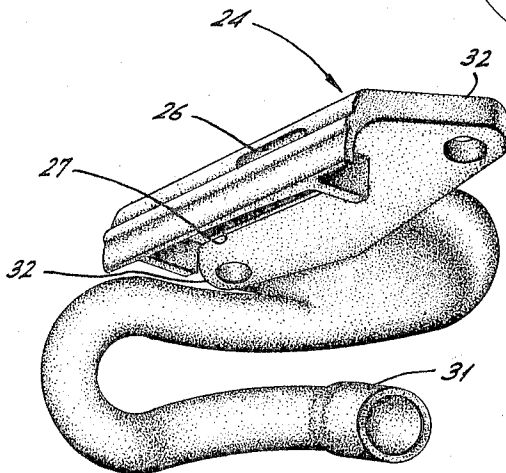
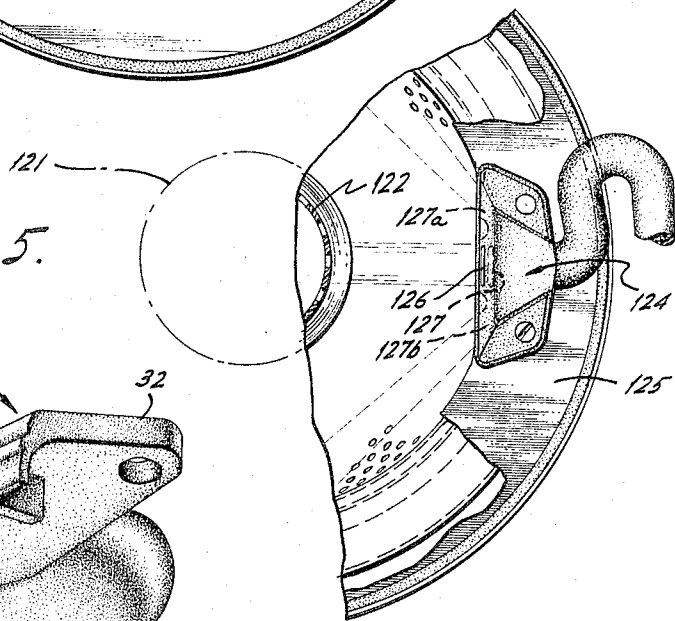


FIG. 4.

INVENTOR.
JOSEPH A. SCHWING
BY

Harry W. Hargis III
AGENT

1

2

3,304,751

LAUNDRY APPARATUS

Joseph A. Schwing, Penn del, Pa., assignor to Philco-Ford Corporation, a corporation of Delaware
 Filed Dec. 16, 1964, Ser. No. 418,664
 7 Claims. (Cl. 68-23)

This invention relates to laundry apparatus, especially apparatus of the type in which fabrics are washed and rinsed in liquid by movement of an agitator within a basket, and in which liquid is extracted from the fabrics by rotation of the basket at a centrifuging speed.

While of broader applicability, the invention is especially adapted for use in a laundry machine of the type having a central agitator extension or post. One such machine is disclosed and claimed in U.S. patent application Serial No. 392,178, filed August 26, 1964, by William E. McAllister et al., and assigned to the assignee of the present invention. The McAllister et al. disclosure relates generally to the combination of a rotatable basket having a central stationary column, preferably comprising a wash-conditioner dispensing apparatus, with a wobble-type agitator arranged substantially concentrically with the stationary column and operable to undulate relative to the latter and produce agitation of liquid and fabrics within the basket.

The present invention has for a general objective the provision of improved means for rinsing fabrics after they have been washed.

It is a specific objective of the invention to provide improved means for spray-rinsing fabrics as they are being centrifuged in the rotatable basket of a washing machine.

It is a further objective of the invention to provide simple and effective spray rinse apparatus in which rapidly rotating elements of the basket are utilized to assist dispersal of the rinse liquid.

The invention is featured by the provision of an arrangement in which an inlet stream of rinse water impinges on a center post, to both free the post of soap and scum and to distribute the water over the clothes load.

In a preferred embodiment of the invention, unitary inlet means is provided for introducing liquid into the rotatable basket of a washing machine, and includes a first nozzle for directing a stream of liquid toward a central column associated with an agitator, and a second nozzle for directing a stream of liquid downwardly toward lateral walls of the basket, whereby spent soap, loose dirt, and like matter are washed from the dispenser, the basket, and the fabrics disposed in the latter. Importantly, as the basket is rotated at centrifuging speed, liquid impinging on the central column is centrifugally sprayed therefrom for impingement upon walls of the basket and the fabrics thereon.

For a more complete understanding of the invention, and of its additional objectives and advantages, reference is made to the following description taken in light of the accompanying drawing, in which:

FIGURE 1 is an elevational-sectional view of a washing machine embodying the present invention, certain parts being broken away for purposes of illustration;

FIGURE 2 is a somewhat enlarged view of a portion of the apparatus illustrated in FIGURE 1;

FIGURE 3 is a plan view of the apparatus seen in FIGURE 1, with parts removed and showing in detail additional features of the invention;

FIGURE 4 is a perspective showing of a portion of the apparatus illustrated in the preceding figures, as viewed from below; and

FIGURE 5 is a view similar to FIGURE 3, and illustrating a modified embodiment of the invention.

With more detailed reference to FIGURE 1, a washing

machine 10 embodying the invention comprises a cabinet 11 having a control panel 12 and an upper wall 13 provided with an aperture 19 over which a hinged door 14 is disposed. A rotatably mounted perforate, generally cylindrical basket 16 is disposed within a tub 15, and each has an upwardly presented opening aligned with aperture 19 in wall 13. An agitator 17 is mounted for movements relative to the basket, to provide for washing and rinsing fabrics in the basket. Preferably, and as described in the reference disclosure, agitator 17 is mounted for undulatory movements. Drive means, of known suitable type is illustrated fragmentarily at D and is coupled to basket 16 and to agitator 17. Under one condition of operation, during the washing and rinsing phases, the agitator is driven while basket 16 remains stationary. Under another condition of operation of the drive means, the basket and agitator are driven as a unit to centrifuge liquid from fabrics in the basket and into the tub for subsequent disposal.

A post 21 having a generally tubular, slightly tapered body portion 22 is supported vertically in the region of its lower, smaller end upon suitable bracket means (not shown) enclosed by agitator 17 and affixed to the bottom of basket 16. The post 21 conveniently serves as a dispenser, and to this end its body portion 22 includes vertically extending slots 23 communicating with its interior region and through which slots liquid and wash-aid material are free to flow. A radially presented flange 29 extend along the periphery of the upper portion of body portion 22, at a level slightly above the upper rim of basket 16 but slightly below the level of the upper rim of the tub 17, which construction and its relationship to the invention will be more fully appreciated later in the description.

With reference to FIGURE 2, a wash liquid inlet head 24 is provided in accordance with the invention and is affixed to the upper, inwardly flanged rim 25 of tub 15, disposed above the region of the upper rim of basket 16. As is illustrated in FIGURES 1, 2, and 3, inlet head 24 includes a first discharge nozzle 26 arranged to direct a stream of wash liquid toward the slotted portion 22 of dispenser 21, and a second nozzle 27 disposed and adapted to direct a stream of wash liquid downwardly and slightly outwardly toward the side wall of basket 16. Each of the streams is represented by broken lines extending from its corresponding nozzle.

It will be understood that control means of known suitable type would be utilized to achieve a laundering cycle comprising a wash phase followed by a rinse phase, in which latter phase the invention has particular utility, as will be more fully appreciated from a consideration of the operation of the apparatus embodying the invention.

In operation of the apparatus, the machine is started in its wash phase, tub 15 filling with liquid, such as water, to immerse the fabrics contained in basket 16 and a major portion of dispenser 21. Operation of the agitator is then initiated, drawing liquid through slots 23 of the dispenser. A solution of liquid and wash-aid material is thus formed in the dispenser and flows downwardly through its central portion and through the bottom of the basket, thence upwardly along its sides into perforations in its vertical wall portion. This flow of liquid prevails throughout the wash phase, in concert with the usual toroidal, agitator-induced, liquid flow within the basket itself, which flow is characteristic of a machine of this type.

After the wash phase is completed, the drive means rotates the basket 16 at centrifuging speed, in achievement of the spin and spray rinse phases, wash liquid being removed from tub 15, as basket 16 rotates, by suitable known drain and pump means (not shown). In

particular accordance with the invention, to insure removal of suds and dirt from the dispenser and from the fabrics centrifuged against the side walls of basket 16, the upper stream of rinse liquid (FIGURES 1 and 2) is directed by the first spray nozzle 26 to impinge on the slotted portion of the extension, or dispenser, from which portion it is centrifugally impelled back onto the fabrics. A portion of the liquid impinging on the dispenser flows through slots 23 and into the interior of the cylinder, from whence it also is centrifuged onto the fabrics. The lower stream of liquid is directed by the second spray nozzle 27 downwardly upon the fabrics (not shown) and centrifuged against the side wall portions of basket 16. A portion of this stream also impinges on the basket rim portion to cleanse the latter as well as the fabrics. In one preferred spray rinse operation, the control is programmed to provide a series of two 5-second spray rinses during a 4-minute operation of the basket at centrifuging speed. Following the above spray rinse portion of the rinse phase, a deep rinse portion is provided in which the tub is filled and the agitator operated.

Considering additional structural details of the inlet head 24, its supply conduit portion 31 includes a loop disposed and adapted to accommodate relative vibrational movements between the tub and the cabinet. While conduit 31 and the looped portion preferably are formed integrally, they may be formed separately and connected by known clamping means. Head 24 further includes tab portions 32 (FIGURE 3) through which holding means, such as the illustrated screws, extend into holding engagement with tub rim 25. The main bore 28 of head 24 communicates with conduit 31 on the one hand, and with nozzles 26 and 27 on the other hand. Upper nozzle 26 is of generally rectangular cross section, and while disposed slightly to one side of the coincident center lines of dispenser 21 and the head, as is best seen in FIGURE 3, the stream of liquid is directed toward the center of the basket to impinge upon tubular portion 22 of the rapidly spinning dispenser. The impinging liquid is carried around to positions in which it is centrifuged from circumferential portions of the dispenser, for secondary impingement on substantially all exposed portions of the fabrics lining the basket wall. Paths of the centrifuged liquid are indicated by the generally radially extending broken lines.

Considering in more detail the cooperability of the dispenser with the stream of liquid impinging thereon, and with reference to FIGURE 1, due to the outward taper of tubular portion 22 toward flange 29 some of the liquid will be caused to flow upwardly toward the flange by upwardly directed components of centrifugal force. This flow of fluid along surfaces of the dispenser achieves improved cleansing of the surfaces of the latter. Some of this liquid flows onto flange 29, and is centrifuged, along with entrained particulate matter, onto portions of the tub above the rim of the basket. By virtue of this arrangement substantial portions of entrained soil advantageously are prevented from impinging on the clothes, impinging instead on the tub walls for drainage therefrom.

To ensure contact of the downwardly directed stream with varying thicknesses of fabrics or clothes layers centrifugally held against the wall of the basket, as well as with the top rim of the basket, the nozzle 27 of spray head 24, as best seen in FIGURE 4, is generally rectangular in cross section and is disposed so that its longer sides are positioned with angularity, in a horizontal plane, as respects the general plane of the vertically extending basket wall illustrated in FIGURES 1 and 2. By virtue of this disposition of nozzle 27, the issuing stream of liquid is generally rectangular in cross section, and has one side positioned to "scrape" the surface of the clothes as the basket rotates.

A modified embodiment of the invention is illustrated in FIGURE 5, and comprises a spray head 124 affixed to tub rim 125. Spray head 124 includes a central nozzle

126 arranged and adapted to direct a stream of liquid for impingement on a slotted tubular portion 122 of a dispenser center post 121. A vertically downwardly presented nozzle 127 is arranged to direct a stream of wash fluid (not shown) onto the basket rim and fabrics, as provided for in the previously described embodiment. Additional nozzles 127a and 127b are arranged to direct divergent streams, as shown, for impingement on fabrics centrifuged against side walls of the basket. Nozzle 127a directs its stream at a level slightly higher than the level of impingement of liquid directed by nozzle 127b. By virtue of this arrangement, substantially complete contact of rinse liquid with the fabrics is ensured.

From the foregoing it will be understood that the invention has particular utility in washing machine construction in which the rotatable clothes container or basket is perforate, since in perforate basket construction it is not practicable to resort to overflow rinsing as is the case with imperforate basket construction. The present invention advantageously overcomes the undesirable tendency of the clothes to filter out spent soap and other foreign matter as the wash liquid is centrifuged through perforations in the basket.

It will be appreciated that the invention provides improved means for rinsing fabrics after they have been washed. These means, desired to be covered by letters patent, are set forth in the appended claims.

I claim:

1. In a washing machine of the type including a centrifugally rotatable, generally cylindrical basket and a centrally located post rotatable with said basket, said post including a free end portion extending beyond said basket and a radially presented flange in the region of said free end portion, said post further being outwardly flared from within said basket toward its flanged portion, means for in-letting rinse liquid to said basket as it rotates at centrifuging speed comprising: first liquid directing means disposed and adapted to direct a stream of liquid for impingement on said post, a portion of said liquid impinging on said post as said basket is rotated being caused to flow upwardly onto said flange and being centrifuged therefrom for impingement in a region other than said basket, and another portion of said liquid impinging on said post being forcibly centrifuged toward side walls of said basket; and second liquid directing means disposed and adapted to direct a stream of liquid toward side wall portions of said basket, liquid centrifuged from said post joining liquid directed from said second liquid directing means for flow over said side walls of said basket.

2. A washing machine according to claim 1, and further characterized by the inclusion of a tub, said basket disposed within and spaced from said tub, and said liquid centrifuged from said flange being so directed as to impinge upon wall portions of said tub.

3. A washing machine comprising: a centrifugally rotatable, generally cylindrical basket for containing fabrics; a tub disposed about said basket in spaced relation thereto; a generally centrally located post affixed to said basket for rotation therewith about a common axis, said post including a radially presented flange disposed exteriorly of said basket but interiorly of said tub, lateral surface portions of said post being flared outwardly from within said basket toward said flange; and means disposed and adapted to direct a stream of liquid for impingement upon said post as said basket is centrifugally rotated, portions of said liquid impinging on said post being centrifuged therefrom for secondary impingement upon surface portions of fabrics centrifugally held against cylindrical walls of said basket, other portions of said liquid impinging on said post being caused to flow along flared lateral surface portions of said post and onto said flange, said liquid thereupon being centrifuged from said flange for impingement on said tub.

4. A washing machine according to claim 3, and characterized in that said post is hollow, and has a plurality

5

of upwardly extending, spaced slots in wall-defined surface portions thereof upon which the stream of liquid impinges.

5. A washing machine according to claim 3, and characterized in that said means disposed and adapted to direct a stream of liquid comprises a spray head provided with a first nozzle for directing said stream, and a second nozzle disposed and adapted to direct a second stream of liquid axially of said basket and over surfaces of the recited centrifugally held fabrics.

6. A washing machine comprising: a centrifugally rotatable, generally cylindrical basket for containing fabrics; a post mounted for rotation with said basket about a common axis, said post including a radially presented flange, and lateral surface portions of said post being flared outwardly from a region within said basket toward said flange; and means disposed and adapted to direct a stream of liquid for impingement upon said post as said basket is centrifugally rotated, portions of said liquid impinging on said post being centrifuged therefrom for secondary impingement upon surface portions of fabrics centrifugally held against cylindrical walls of said basket, other portions of said liquid impinging on said post being caused to flow along flared lateral portions of said post and onto said flange, said liquid thereupon being centrifuged from said flange, said flange being so positioned that liquid centrifuged therefrom is caused to impinge on structure adjacent said fabrics, whereby to rinse such structure in addition to said fabrics.

6

7. A washing machine comprising: a centrifugally rotatable, generally cylindrical basket for containing fabrics; a tub disposed about said basket in spaced relation thereto; a generally centrally located post affixed to said basket for rotation therewith about a common axis, said post including a portion disposed exteriorly of said basket but interiorly of said tub; and means disposed and adapted to direct a stream of liquid for impingement on said post as the basket is centrifugally rotated, rotation of said post with said basket causing portions of said liquid impinging on said post to be centrifuged therefrom for secondary impingement upon surface portions of fabrics centrifugally held against cylindrical walls of said basket, such rotation causing other portions of said liquid impinging on said post to be centrifuged from the exteriorly extending portion thereof for impingement on said tub, whereby to rinse both said tub and said fabrics simultaneously.

References Cited by the Examiner

UNITED STATES PATENTS

2,274,402	2/1942	Dunham	68—148	X
2,350,108	5/1944	Geldhof et al.	68—23	X
2,480,921	9/1949	Hahn	68—148	
2,526,344	10/1950	Geldhof et al.	68—23	X
2,942,444	6/1960	Abresch	68—17	

WILLIAM I. PRICE, *Primary Examiner.*