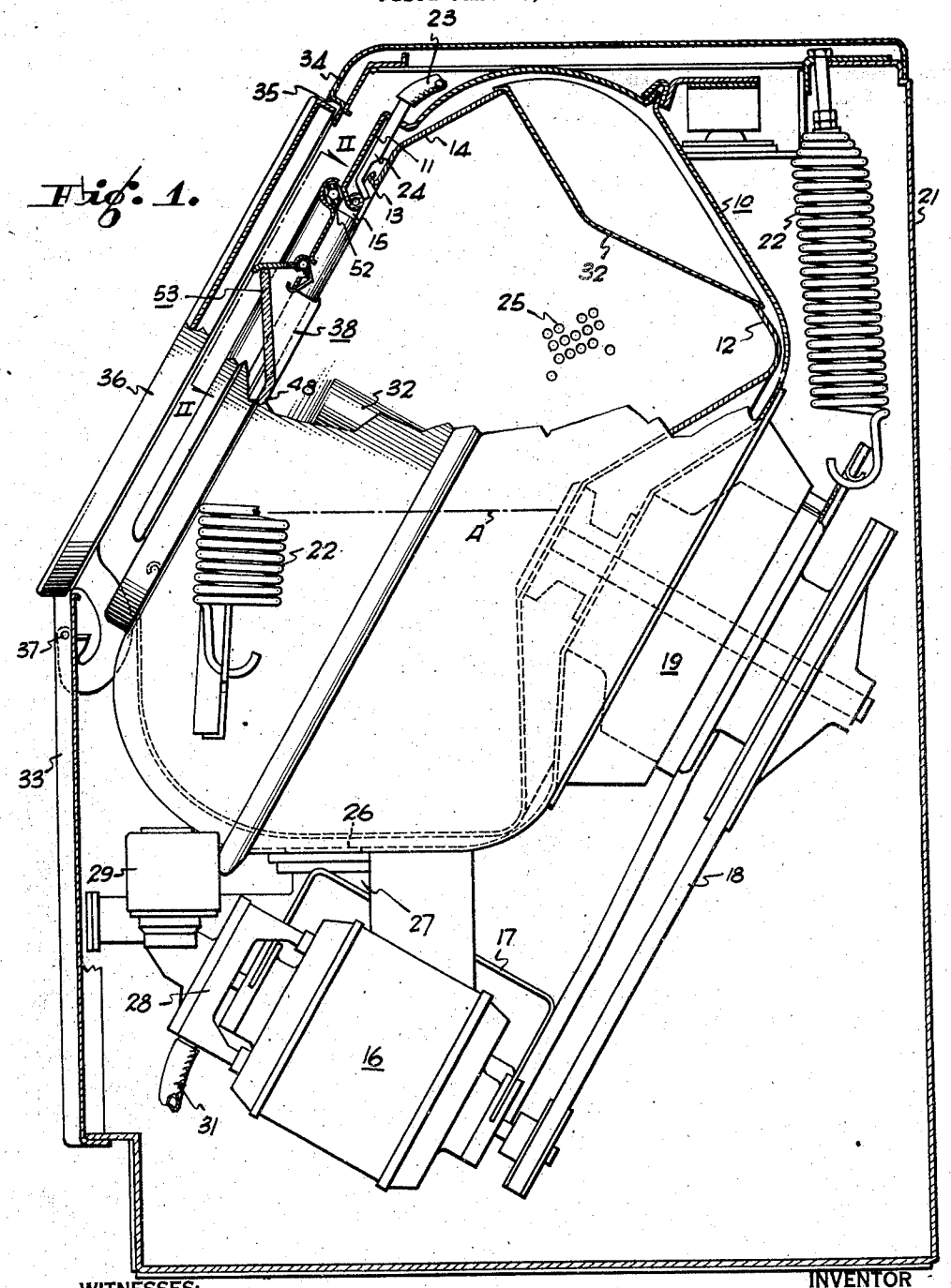
Sept. 22, 1942. F. BRECKENRIDGE 2,296,264

LAUNDRY APPARATUS

Filed Jan. 30, 1940 2 Sheets-Sheet 1

Fig. 1.



WITNESSES:

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LAUNDRY APPARATUS

Filed Jan. 30, 1940 2 Sheets-Sheet 2

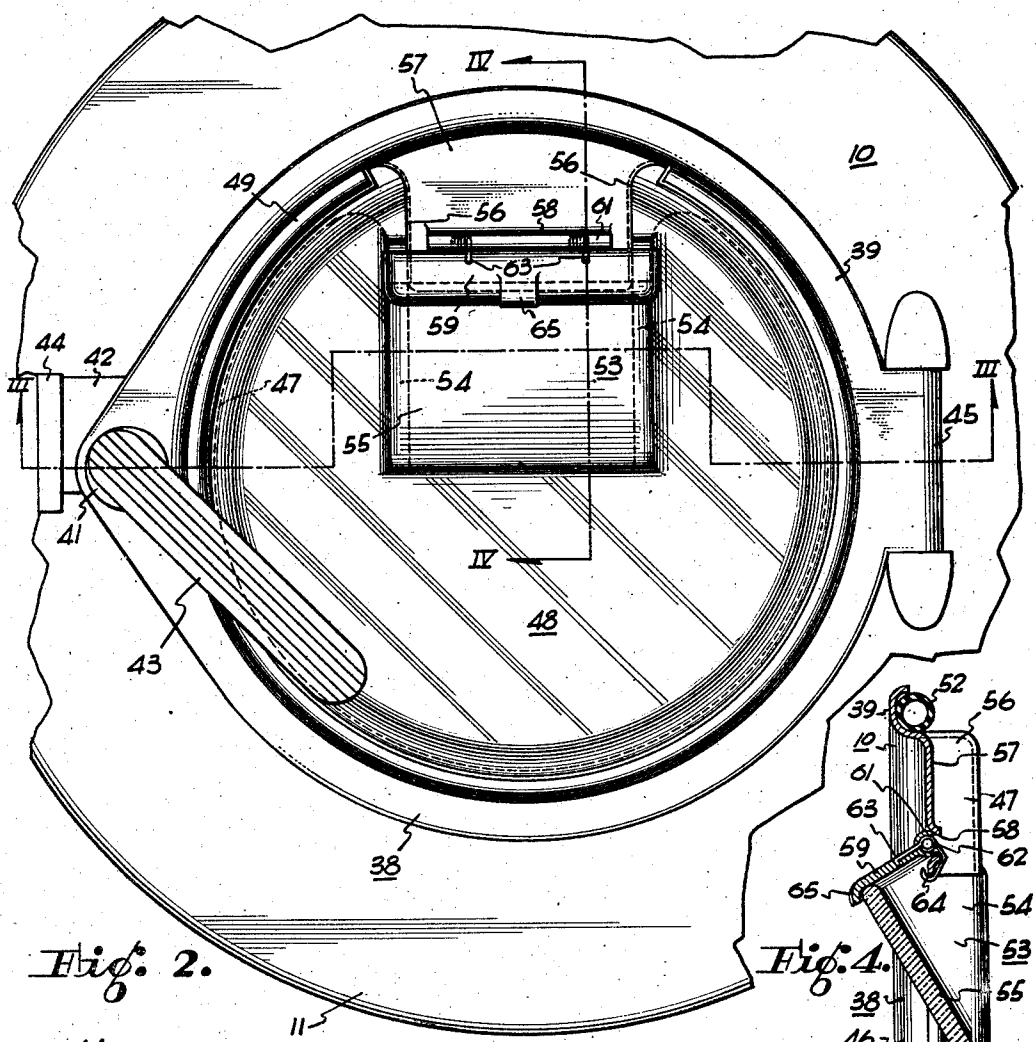


Fig. 2.

Fig. 4.

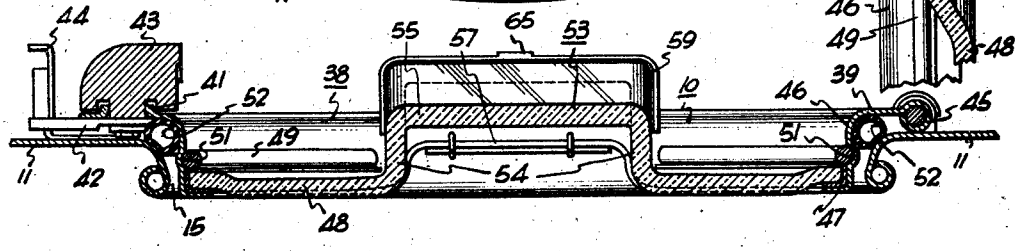


Fig. 3.

WITNESSES:

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Patented Sept. 22, 1942 2,296,264

UNITED STATES PATENT OFFICE

2,296,264

LAUNDRY APPARATUS

Frank Breckenridge, Mansfield, Ohio, assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application January 30, 1940, Serial No. 316,351

6 Claims. (Cl. 68—17)

My invention relates to laundry apparatus and has for an object to provide improved apparatus of this kind.

A further object of my invention is to provide improved means for admitting a detergent to the washing chamber of a laundry machine.

It is a further object of the invention to provide improved soap admission provisions for a washer of the type having a perforate basket rotatable about a generally-horizontal axis within a tub wherein the soap is deposited directly in the basket and is prevented from passing to the drain of the tub in an undissolved condition.

A still further object of the invention is to provide improved non-corrosive means for admitting soap to a water-tight washing chamber and for providing venting of the chamber.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in accordance with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a vertical sectional view taken through one form of washer having my invention applied thereto, certain portions of the view being shown in elevation for the sake of clearness;

Fig. 2 is an enlarged front view of the door of the tub shown in Fig. 1; and,

Figs. 3 and 4 are sectional views taken along the respective lines III—III and IV—IV of Fig. 2.

Reference will now be had to the drawings wherein I have shown my invention applied to a laundry machine of the general type disclosed and claimed in my copending application, Serial No. 203,804, filed April 23, 1938, and assigned to the assignee of the present application. The laundry machine includes a tub structure 10, generally of frusto-conical configuration, and having its axis disposed at an acute angle to the vertical so that its end wall 11 of major dimension is faced upwardly and forwardly.

A basket structure 12 of frusto-conical formation is disposed substantially in coaxial relation within the basket 10 and has an access opening 13 formed in its end wall 14 of major dimension. The access opening 13 of the basket 12 registers with an access opening 15 formed in the end wall 11 of the tub structure.

The laundry apparatus disclosed is of the inclined axis type but it will be understood that this form of washer is shown by way of example and that other types of washing apparatus having an axis of rotation extending generally horizontal may be constructed in accordance with this invention. By a generally horizontal axis, I mean one which extends either directly horizontal or is inclined with respect to the horizontal up to 60° therefrom.

Rotation of the basket 12 within the tub 10 at relatively low speed during washing periods and at relatively high speed during fluid-extracting periods is effected by a motor 16 suspended by means of a bracket structure 17 on the underside of the tub and belted, as shown at 18, to a two-speed mechanism, generally indicated at 19, and carried by the tub structure 10. The two-speed mechanism 19 may be of any well-understood construction and is adjustable to provide the low speed for the basket 12 during washing periods and to drive the same at high speed during the centrifuging periods. A two-speed mechanism of the type shown at 19 combined with a tub of generally frusto-conical configuration is disclosed and claimed in my copending application, Serial No. 305,512, filed November 21, 1939, and assigned to the assignee of the present application.

From the foregoing it will be apparent that the tub 10, the motor 16 and the two-speed mechanism 19 define major elements of a unitary structure which may be supported within an enclosing 21 in any well-understood manner. Preferably the support for the unitary structure is flexible so that it is free to vibrate in all modes within the casing 21 and without imparting objectionable vibrations to the casing. The flexible support may include a plurality of tension springs 22 which are suitably attached to the unitary structure and which are carried by the casing 21. A flexible support of the general type shown herein having vibration damping provisions is disclosed and claimed in my copending application, Serial No. 226,853, filed August 26, 1938, and also in the copending application of Frank Breckenridge et al., Serial No. 303,202, filed November 7, 1939, both of which applications are assigned to the assignee of the present application.

Washing water may be admitted to the tub from suitable sources of hot and cold water (not shown) through a flexible conduit 23 which terminates in a nozzle structure 24 carried by the tub 10, the nozzle 24 being so disposed that it directs water through the access opening 13 of the basket. In this connection it will be understood that the basket is perforate, a number of the openings being shown at 25, so that the water flows through the basket and into the tub. Vitiated water is conveyed from the tub through an opening 26 formed in the bottom thereof and which communicates by means of a conduit structure 27 with the inlet of a pump 28, the latter

being preferably driven by the motor 16. Flow of water from the drain 26 to the inlet of the pump 28 may be controlled by a suitable electrically-operated valve, generally shown at 29. The discharge of the pump 28 is connected by means of a suitable flexible conduit 31 to a point of discharge. During washing periods, the level of the water contained in the tub 10 is indicated by the broken line "A" in Fig. 1.

During washing periods, the basket 12 is rotated at relatively low speed, or approximately 52 R. P. M., by means of the two-speed mechanism 19, and the fabrics are agitated in the water for cleansing the same. The method of agitating the fabrics forms no part of the present invention so that it will not be described other than to say that a plurality of inwardly-extending and circumferentially-spaced vanes 32 are provided within the basket 12 which elevate and drop the fabrics during the washing operation. The specific vane and basket structure which I have shown is disclosed and claimed in the copending application of Stuart R. Baird, Serial No. 268,103, filed April 15, 1939, and assigned to the assignee of the present application.

As set forth heretofore, the unitary washing and spinning structure is enclosed by a casing 21 which includes a front wall 33, the upper portion of which is inclined as shown at 34, the inclined portion 34 of the front wall being disposed in a plane normal to the axis of the tub and basket. An opening 35 is provided in the front wall portion 34, said opening being closed by a movable cover 36. As shown, the cover 36 is pivoted at 37 to the casing 21 and may be swung to a substantially horizontal position for providing a work shelf at the front of the washer during its operating periods, as disclosed and claimed in the copending application of William J. Russell, Serial No. 314,577, filed January 19, 1940, and assigned to the assignee of the present application. During inactive periods, the door 36 is swung to its closed position for completely enclosing the working mechanism.

During operating periods of the washer, the access opening 15 of the tub structure 10 is closed by a door, generally shown at 38, that is gasketed and latched shut so that a substantially water-tight connection is defined by the perimeter of the door 38 and the tub 10.

As best shown in Figs. 2 to 4, inclusive, the door structure 38 includes a generally annular rim 39, one side of which is formed to define a bearing 41 for a movable latch member 42, the latter being swung to its latched and unlatched positions by means of a handle 43. The movable latch 42 cooperates with the stationary catch 44 suitably secured to the end wall 11 of the tub. The opposite side of the annular rim 39 is formed to define a hinge 45, the stationary portions of which are secured to the front wall 11 of the tub. As the specific form of latch and hinge structures form no part of the present invention, a further description of the same is deemed unnecessary. It will be understood that the overall length of the door structure 38 is less than the width of the opening 35 formed in the casing so that the door may be swung upwardly through the opening 35 when access to the basket is desired.

The rim 39 is embossed to form a substantially annular wall 46 extending axially and which terminates at its inner end in an inwardly-extending flange 47. The central portion of the door 38 is defined by a glass partition 48 which is substantially flat except as hereinafter described. The glass partition 48 is positioned by the inwardly-extending flange 47 and by means of an arcuate spring member 49 which is sprung within a seat 51 formed in the axially-extending wall portion 46 of the rim. A suitable gasket 52, annular in configuration, is arranged on the exterior of the wall member 46 and is engageable with the perimeter of the tub opening 15 so that a water-tight seal is defined at this point.

In accordance with my invention, a non-corrosive chute or passage is disposed in registry with the access opening 13 of the gasket for the admission of a detergent directly to the basket. The soap passage or chute is shown at 53 and is enclosed within an offset portion formed in the glass partition 48. The chute 53 is defined by laterally-spacing walls 54, generally triangular in shape, and a sloping wall 55 which connects the outer margins of the triangular walls 54 and which is disposed at an angle to the plane of the glass partition 48, as best shown in Fig. 4. Both the triangular-shaped walls 54 and the sloping walls 55 are preferably integral with the glass partition 48.

A portion of the rim 39 is embossed to define laterally-spaced side walls 56 and a front wall 57 connecting the same, the front wall 57 being disposed above an intermediate portion of the chute 53, as best shown in Fig. 4, and the spaced side walls 56 extending upwardly in the planes of the spaced walls 54 of the chute 53. An elongated opening or seat 58 is formed in the front wall 57 for receiving a lid or cover 59 for the chute 53. The lid 59 engages the outer ends of the triangular walls 54 and the sloping wall 55 and defines a closure for the chute 53. The inner margin of the lid 59 is enlarged to provide a bead 61 that is generally cylindrical in cross-section and which is seated within the seat or opening 58. A hinge is therefore defined by the seat 58 and bead 61 about which the lid 59 is movable. The lid 59 is biased toward its closed position by torsional springs 62, one end of each being hooked within openings in the lid, as shown at 63, and the other ends of which engage a portion of the wall 57, as shown at 64. The springs 62 not only function to continually bias the lid 59 closed but, because of their hooked connections, as shown at 63 and 64, to the lid 59 and the wall 57, the springs 62 maintain the cylindrical portion 61 of the lid seated within the opening 58. A suitable handle 65 projects from the lid 59 for facilitating the opening movement thereof.

When the washer is to be operated, the lid 36 is swung to its lowered or horizontal position and the door 38 swung upwardly through the opening 35. The fabrics to be treated are then deposited in the basket 12 and the door 38 latched in its closed position. Water is admitted to the tub and basket through the nozzle 24 until the level rises to the line indicated at A in Fig. 1. If it is desired to prewash or soak the clothes, slow speed operation of the basket is initiated during which time the clothes are tumbled in the fresh water for loosening the soils therein.

The washing operation is initiated by admitting soap to the wash water which is effected by pouring the soap through the chute 53 after opening the lid 59. The chute 53 is arranged opposite the access opening 13 of the basket and above but adjacent to the level of the water in the basket. The chute is so disposed relative the basket that the soap poured therein

is directed by gravity into the body of water contained in the basket. Substantially none of the soap admitted at this time can enter the intervening space between the basket and the tub without first passing through the body of water contained within the basket. Accordingly, the passage of soap particles in an undissolved form directly to the drain 26 is precluded. Any soap which may cling to the walls of the chute will be washed therefrom by the splashing water within the basket so that the walls of the chute are maintained clear of soap at all times.

The soap is thoroughly dissolved in the agitated body of water within the basket so that a very efficient washing solution is obtained. I consider this an important feature of my invention as, in prior structures of which I am aware, the soap is directed by the soap admission chute in such manner that a substantial quantity thereof is first deposited in the intervening passage between the basket and the tub for dissolution. In these prior art structures, however, a substantial quantity of the soap in undissolved form may find its way to the drain passage and in time collects therein so that clogging of the drain may occur. Furthermore, there is less agitation of the water in the intervening passage referred to heretofore so that the dissolving of the soap is slower and the process of quickly producing suds within the basket is retarded. In this connection, it will be also noted that particles of wet soap may be retained in a chute which communicates with the space intervening between the basket and the tub and therefore corrosion of the chute walls is effected.

After the washing operation is completed, the soapy vitiated water is discharged from the tub through the opening 26 by means of the motor-driven pump 28. The fabrics may then be rinsed by admitting clear rinse water to the tub through the nozzle 24 and tumbling the fabrics in the water. During the rinsing operation, the clean clear water is splashed over the soap chute walls so that they are thoroughly flushed clean of any soap collections. The rinse water is then discharged and the basket 12 is rotated at a relatively high speed of, for example, 550 R. P. M. for centrifuging the water from the fabrics. Subsequent to the centrifuging operation, the door 38 may be opened and the damp-dried fabrics removed from the basket.

A further feature of my invention resides in forming the soap chute 53 of a vitreous material so that any collection of soap particles or soap film therein will not corrode the walls of the chute. Furthermore, by arranging the soap chute 53 within the door structure, the cost of producing laundry apparatus having the soap admission features is substantially reduced as the glazed portion of the door usually employed and the rim for supporting the same may be readily modified to define the soap admission opening as described heretofore.

It will be apparent from the description of the specific embodiment shown that the soap chute 53 is elevated above a portion of the access opening 13 of the basket so that the material admitted therethrough drops directly by gravity into the basket. When applied to washers of the horizontal axis type or having an axis substantially horizontal, the sloped wall member 55 of the chute is effective to direct the soap inwardly through the access opening of the basket and without permitting any material quantity thereof to pass to the intervening space between the basket and the tub. Any soap particles which may adhere to the passage 53 after the passage of soap therethrough will be effectively washed from the walls of the passages by the splashing of the agitated water within the basket.

The soap admission chute 38 also defines a vent for the tub which permits vapors to pass therefrom. The spring-biased lid of the chute 38 while permitting venting prevents water from being splashed from the tub during normal operation. Venting of the tub in a washer of the type shown having a water-tight access door is also desirable in order to prevent excessive pressures from building up in the tub in the event that sufficient water is admitted to the tub to fill the same and thereby subject the tub structure to the full pressure of the water supply. Obviously, the relatively light spring associated with the lid 59 would permit opening of the lid if the latter is subjected to a slight pressure within the tub in excess of atmospheric pressure.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In laundry apparatus, the combination of a tub, a basket rotatably disposed therein and having its axis extending in a generally horizontal direction, said tub and basket having registering access openings therein disposed about said axis, a movable cover for closing the opening in the tub, means including a wall inclined toward the opening in the basket for defining a soap passage in the cover, and readily adjustable means for closing said passage.

2. In laundry apparatus, the combination of a tub, a basket rotatably disposed therein and having its axis extending generally in a horizontal direction, said tub and basket having registering access openings formed in end walls thereof, a door hinged to the tub for closing the opening therein, said door having a central vitreous portion disposed opposite the opening in the basket, said vitreous portion having a passage formed therein for the admission of soap to the basket and defined at least in part by a vitreous wall sloped toward the basket opening, and readily adjustable means for closing the passage.

3. In laundry apparatus, the combination of a tub, a basket rotatably disposed therein, said tub and basket having their axes disposed at an acute angle from the vertical so that adjacent ends of the basket and tub face forwardly and upwardly, said ends having registering access openings formed therein, a door hinged to said tub for closing its access opening, said door having a soap passage so formed therein that soap admitted to the passage is directed by gravity through the access opening of the basket, and readily adjustable means for closing said soap passage.

4. In laundry apparatus, the combination of a tub of substantially frusto-conical configuration, a basket of frusto-conical configuration disposed coaxially within the tub, said tub and basket having their axis inclined so that the end walls thereof of major dimension faces upwardly and forwardly, said end walls of the tub and basket having registering access openings formed therein, a gasketed door having a vitreous cen-

tral portion hinged to the tub for closing its access opening, said vitreous portion being provided with a passage, the inner end of which is disposed above a portion of the access opening of the basket so that soap discharged by the passage gravitationally passes to the basket, and means for closing said opening and providing for venting of the tub.

5. In laundry apparatus, the combination of a tub, a perforate basket rotatable therein, said tub and basket having an axis extending generally in a horizontal direction and said tub and basket being provided with respective registering access openings in adjacent end walls thereof, means for admitting water to the tub, a door hinged to the tub and closing the access opening therein, said door having a passage formed therein for admitting soap to the basket, said passage being so disposed that soap passed therethrough is directed by gravity into the basket through its access opening, means for closing said passage and drain means for removing water from the tub and disposed so that a portion of the basket intervenes between it and the soap passage.

6. In laundry apparatus, the combination of a tub having its axis extending in a generally horizontal direction, a basket disposed in the tub and rotatable about said axis, said tub and basket having respective adjacent end walls, the end wall of the basket being provided with an opening, and means defining a passage for soap in the end wall of the tub and in registry with said opening in the basket, said passage being so formed that soap admitted thereto is discharged by gravity through the opening in the basket.

FRANK BRECKENRIDGE.