Jan. 13, 1959 L. H. TINGLEY, JR 2,868,006

CLOTHES TREATING LIQUID DISPENSER FOR AUTOMATIC WASHING MACHINES

Filed Jan. 13, 1956 2 Sheets-Sheet 1

Fig. 1

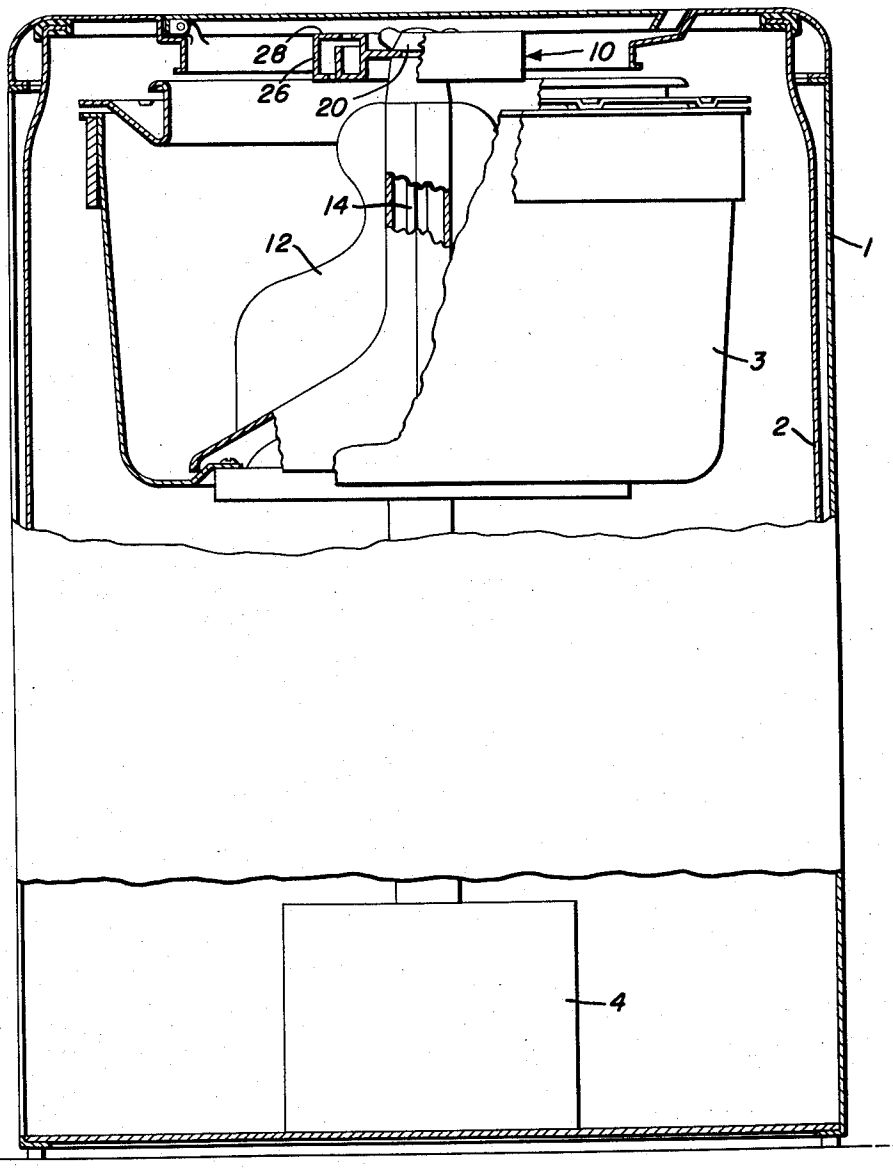
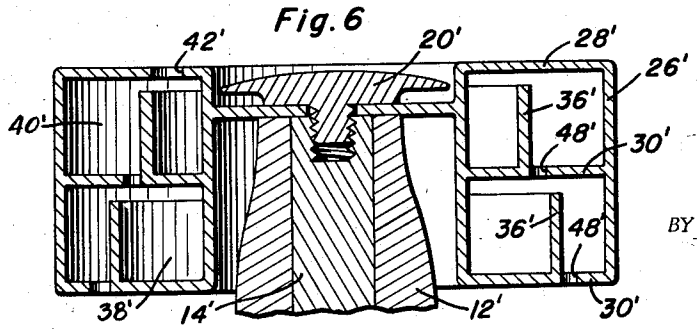


Fig. 6



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Fig. 2

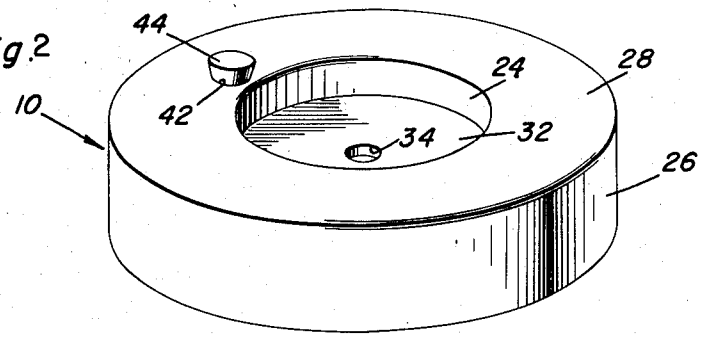


Fig. 3

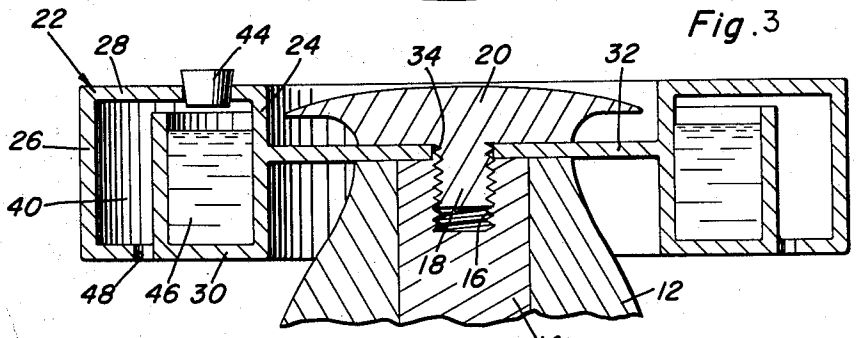


Fig. 4

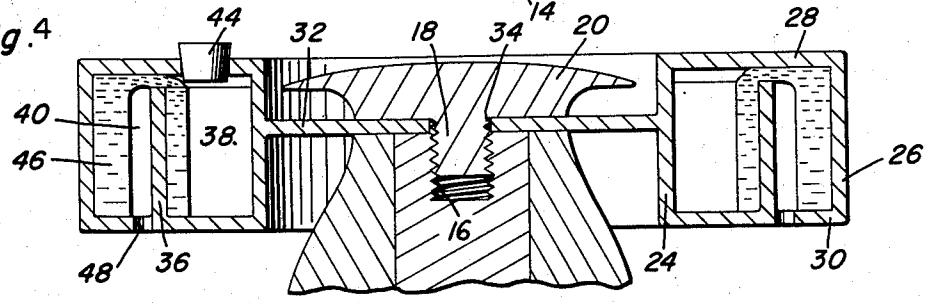
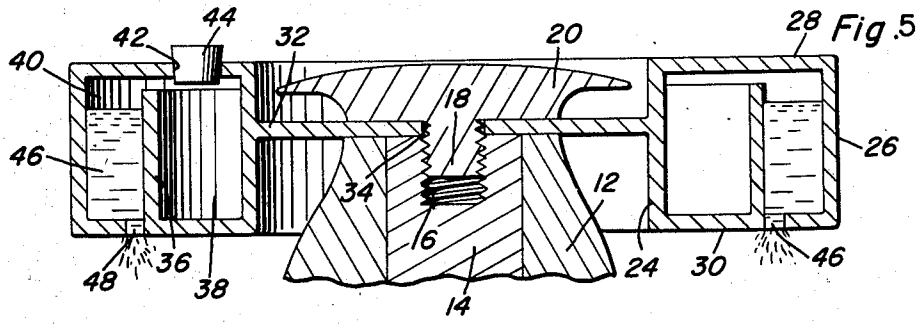


Fig. 5



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CLOTHES TREATING LIQUID DISPENSER FOR AUTOMATIC WASHING MACHINES

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Application January 13, 1956, Serial No. 559,011

14 Claims. (Cl. 68—207)

This invention generally relates to a dispenser for automatic washing machines and more particularly provides a device for automatically dispensing liquids into the automatic washing machine at the proper time during the several cycles or stages of operation of the washing machine.

In the operation of automatic washing machines, the articles of clothing along with the soap or detergent are positioned in the tub after which the machine automatically fills with water, washes the clothes for a predetermined intervals, spins out or centrifugally extracts the wash water, stops the tub and refills the same with rinse water, thoroughly rinses the clothes and then spin dries the clothes. In some instances, it is desirable to insert or pour liquids or other material into the rinse water for treatment of the clothes. When this is desired, it is necessary for the housewife or person operating the washing machine to listen to or observe the various stages of operation and insert the desired material at the proper time. This requires the attention of the housewife, thereby eliminating some of the advantages of the automatic washing machine. Accordingly, it is the primary object of the present invention to provide an attachment for automatic washing machines which will automatically dispense the desired quantity of clothes treating fluid or other flowable material into the rinse water at the proper time, thereby rendering the cycle of operation completely automatic.

Yet another object of the present invention is to provide an attachment for automatic washing machines as set forth in the preceding paragraphs which is extremely simple in construction, provided with no moving parts, easy to attach to existing washing machines, foolproof in operation, well adapted for its intended purposes and extremely inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of an automatic clothes washing machine with the dispensing device attached to the agitator, portions of the machine being broken away to more clearly illustrate details of the structure;

Figure 2 is a perspective view of the dispensing attachment of the present invention;

Figure 3 is a detailed transverse sectional view illustrating the device attached to an agitator or impeller illustrating the initial position of the clothes treating liquid prior to beginning of the washing machine cycle and during the initial agitation of the clothes during the washing cycle;

Figure 4 is a sectional view similar to Figure 3 illustrating the disposition of the treating liquid as the impeller is spinning the wash water away from the clothes;

Figure 5 is a sectional view similar to Figures 3 and 4 illustrating the next step of operation of the dispenser wherein the agitator has stopped and the tub is being refilled with rinse water and the liquid is being discharged into the rinse water through the discharge openings; and

Figure 6 is a vertical sectional view of a modified dispensing attachment.

Referring now specifically to the drawings, there is disclosed in Figure 1 an automatic clothes washing machine comprising a cabinet 1 in which is disposed an outer tub 2. Positioned within the outer tub 2 and arranged for rotation relative to the outer tub, is an inner clothes-receiving tub or basket 3. A motor and gear unit 4 is provided to impart an oscillatory motion to an agitator 12 during the wash cycle and to rotate the basket 3 at high speed during the extraction cycle. The agitator is oscillated by a polygonal vertical drive shaft 14 connected to the transmission and having an internally threaded socket 16 at the upper end thereof for receiving the exteriorly threaded stud 18 on a cap 20 which normally retains the impeller or agitator 12 on the shaft and permits removability thereof for cleaning.

The numeral 10 generally designates the dispensing attachment of the present invention for attachment to the impeller 12 or agitator of the automatic washing machine. More particularly, the dispensing attachment 10 includes an annular container generally designated by the numeral 22 and including an inner annular side wall 24 and an outer annular side wall 26 in spaced concentric relation which are interconnected by a top wall 28 and a bottom wall 30 thereby forming a closed container 22 of hollow construction. A central plate 32 of circular configuration is provided within the annular wall 24 and forms a closure therefor. The plate 32 is disposed below the top wall 28 and includes a central aperture 34 for permitting passage of the externally threaded stud 18. By positioning the plate 32 against the upper surface of the shaft 14 and impeller 12 and then inserting the stud 18 into the socket 16 and tightening the cap 20, the device 10 may be securely and detachably attached to the impeller 12.

Disposed concentrically between the inner and outer walls 24 and 26 is a vertically disposed baffle 36 integrally formed with the bottom wall 30 and spaced slightly below the upper wall 28 to provide a communication passage between an inner compartment or receptacle section 38 and an outer compartment 40. Disposed in the top wall 28 is an access opening 42 having a removable closure plug 44 therein, the opening 42 being disposed over the inner compartment 38 for permitting liquid 46 to be introduced into the inner compartment 38.

Circumferentially arranged in the bottom wall 30 is a plurality of discharge openings 48 located just exteriorly of the baffle plate 36 for permitting discharge of the liquid 46 downwardly from the outer compartment 40 through the bottom wall 30 in a manner described hereinafter.

In the operation of the embodiment of the invention specifically illustrated, the dispenser 10 is attached to the impeller 12 in a manner described previously and may be retained thereon for extended periods of time and only removed when the impeller is removed for cleaning or the like. The closure plug 44 is removed and a desired quantity of fluid 46 is poured into the inner compartment 38 at the same time as the clothes are positioned in the tub and the detergent or soap disposed therein after which the automatic washing machine is put into operation. The tub is initially filled with water and the impeller 12 begins its oscillation movement after the water in the tub has reached a predetermined level. The oscillation of the impeller 12 continues for a predetermined length of time and during this oscillation, the fluid 46 will have a slight back and forth movement in the inner compartment 38

but due to the absence of any prolonged centrifugal force, the liquid 46 will be retained in the inner compartment by the barrier formed by the baffle 36. After the washing operation has been completed, the tub and impeller 12 spin as a unit for spinning out or extracting the wash water by centrifugal action. During this spining operation, the fluid 46 is acted upon by centrifugal force and is forced upwardly over the upper edge of the baffle 36 and into the compartment 40 substantially as illustrated in Figure 4. The side wall 26 and the adjacent portions of the top wall 28 and bottom wall 30 form an outer wall that is generally U, C, or trough-shaped in cross-section and is disposed outwardly of the receptacle section 38 and defines a space that opens toward the axis of rotation of the dispenser and is in communication with said receptacle section. During the spinning movement of the impeller 12 and the tub, the fluid 46 will be retained against the inner surface of the outer wall 26 by centrifugal force which will retain the fluid 46 away from the discharge openings 48 in the bottom 30. The openings 48 are located radially inwardly of the side wall 26 a sufficient distance to prevent discharge of the rinse agent therethrough during the centrifugal extraction operation but are effective to drain the rinse agent from the dispenser at the end of the centrifugal extraction operation for use in treating the rinse water in the washing machine during the rinsing operation. Due to the increase in radius of the fluid 46 as it moves from the inner compartment 38 to the outer compartment 40, the outer compartment 40 may have less cross sectional area. During the complete spining operation, the fluid 46 will be retained against the inner surface of the outer wall 26 and after the spinning operation, the drain line from the tub is automatically closed and the tub and impeller come to a stop. The tub then is refilled with rinse water and while the rinse water is being discharged into the tub, the liquid 46 will flow through the discharge openings 48 by the force of gravity into the rinse water for thoroughly intermingling with the clothes during the agitation of the impeller 12 during the rinsing operation.

It will be understood that various types of liquid clothes treating material or chemicals may be employed such as a recent commercially available material for making the clothes soft and fluffy when laundered. However, it will be clearly understood that any materials of a liquid nature may be employed such as blueing or starch wherein it is desired to discharge the liquid material into the rinse water.

The entire device may be constructed of any suitable material such as plastic or metal although plastic lends itself to relatively inexpensive manufacturing cost. While the device has been specifically illustrated as having a closure plug, any type of closure cap or closure member may be provided which is securely retained in position during the spinning operation.

In some types of automatic washing machines, two rinsing operations are provided each preceded by a centrifugal extraction operation and if this is the case, it would be only necessary to provide a duplicate arrangement, as illustrated in Fig. 6 of compartments 38' and 40' axially of the first and second compartments 38 and 40 and axially spaced therefrom which would be identical in construction except that the inlet for the concentric inner compartment of the duplicate arrangement would receive the liquid from the discharge openings 48 of the first arrangement. Primed reference numerals are employed in Figure 6 to designate parts corresponding to the parts in Figures 2–5. While the device has been specifically illustrated as being attached to the impeller or agitator, the device may be attached to any of the rotating and oscillating elements employed in automatic machines such as the shaker type tub. Also, the device may be cast as an integral part of the impeller, agitator or other movable element of the machine.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a washing machine adapted to proceed through a sequence of operations including a washing operation, a first centrifugal extraction operation, a rinsing operation and a second centrifugal extraction operation, a rotatable clothes basket, an agitator disposed within said clothes basket, drive means for oscillating said agitator for washing clothes and for rotating said basket to extract liquid centrifugally from said clothes and causing said agitator to rotate with said basket during the rotation thereof, and a rinse agent dispenser mounted on said agitator for discharging a rinse agent into said basket after the first extraction operation to treat the liquid in said basket during said rinsing operation, said dispenser including a receptacle section for accommodating said rinse agent during the oscillation of said agitator during said washing operation, a compartment generally U-shaped in cross section disposed outwardly of said receptacle section and opening toward and in communication with said receptacle section for receiving and holding said rinsing agent upon the rotation of said agitator during said first extraction operation, and outlet means for discharging said rinse agent from said compartment into said basket upon the termination of the agitator rotation at the end of said first extraction operation.

2. In a clothes washing machine adapted to proceed through a sequence of operations including a washing operation, an extraction operation, and a rinsing operation, a member which rotates at high speed during said extraction operation, and a dispenser mounted on said member for discharging a rinsing agent into said machine after said extraction operation to treat the liquid in said machine during said rinsing operation, said dispenser including a receptacle section for accommodating said rinsing agent during said washing operation and means including a compartment disposed outwardly of said receptacle section and opening toward said section for receiving and retaining said rinsing agent upon the rotation of said member during said extraction operation and for discharging said rinsing agent into said machine at the close of said extraction operation.

3. A clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, a rotatable clothes basket, an agitator disposed within said clothes basket, drive means for driving said agitator for washing clothes and for rotating said basket to extract liquid centrifugally from said clothes and causing said agitator to rotate with said basket during the rotation thereof, and a rinse agent dispenser mounted on said agitator for discharging a liquid rinse agent after the extraction operation to treat the liquid in said basket during the rinsing operation, said dispenser including means for containing said rinse agent in said dispenser during the washing operation, means for retaining said rinse agent in said dispenser during the extraction operation, and means for discharging the rinse agent at the end of the extraction operation.

4. A device for dispensing liquid into an automatic washing machine having a washing operation and a subsequent centrifugal extraction operation for removing the wash water before a rinsing operation, said machine including an agitator rotating at a high speed during said extraction operation, said device comprising a container having a hollow interior defined by inner and outer side walls, a top, and a bottom, an upstanding baffle on the bottom of the container and terminating in spaced relation to the top, said baffle being annular and concentrical-

ly spaced from the inner and outer side walls of the container, forming separate inner and outer compartments, means including a central plate provided with an aperture for mounting the container on said agitator with the inner compartment being disposed towards the center of rotation thereof, whereby said agitator will support the container in a position for liquid to flow from the container into the machine, said container also having means for permitting the introduction of a rinse agent into the inner compartment and having circumferentially spaced discharge openings in the bottom of the container in the outer compartment adjacent the baffle; whereby liquid will remain in the inner compartment of the container during the washing operation of the machine and will be discharged by centrifugal force over the baffle against the outer side wall of the outer compartment of the container upon rotation of the agitator during extraction and discharge through the openings when the agitator stops.

5. The combination of claim 4 wherein said means for permitting introduction of the rinse agent into the inner compartment includes an access opening in the top of the container radially inwardly of the baffle, and a removable closure in said access opening.

6. In a washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, a rotatable clothes basket, an agitator disposed within said clothes basket, drive means for driving said agitator for washing clothes and for rotating said basket to extract liquid centrifugally from said clothes and causing said agitator to rotate with said basket during the rotation thereof, and a rinse agent dispenser mounted on said agitator for discharging a rinse agent after said extraction operation to treat the liquid in said basket during said rinsing operation, said dispenser including a receptacle section for accommodating said rinse agent during said washing operation, and means including a compartment disposed outwardly of said receptacle section and opening toward and in communication with said section for receiving and retaining said rinse agent upon the rotation of said agitator during said extraction operation, and means for discharging the rinse agent into said basket at the close of said extraction operation.

7. For use in a clothes washing machine adapted to proceed through a sequence of operations including a clothes washing operation, an extraction operation, and a rinsing operation, and having a member which rotates at high speed during said extraction operation; a dispenser adapted to be mounted on said member for rotation therein and to contain a rinsing agent to be dispensed for treating rinse water in the machine, said dispenser including a receptacle section for accommodating and retaining said rinsing agent separate from washing liquid during said washing operation and including a compartment disposed outwardly of said receptacle section and opening toward and communicating with said section for receiving and retaining said rinsing agent therein upon discharge from said receptacle section under centrifugal force by the rotation of said member during said extraction operation, and means effective for draining said rinsing agent from said compartment at the close of said extraction operation for use in treating the rinse water during the rinsing operation.

8. A dispenser for use in a clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation and having a member which rotates at high speed during said extraction operation, said dispenser comprising a hollow receptacle for receiving a rinsing agent and for retaining said agent separate from washing liquid during the washing operation and including means for mounting the same on said member for rotation therewith above the clothes to be washed in said machine, said dispenser having an outer peripheral wall portion that is generally C-shaped in radial cross-section to retain said agent in the dispenser at the outer periphery thereof when impelled outwardly by centrifugal force during the centrifugal extraction operation, and discharge means located radially inwardly of the outermost part of said wall portion a sufficient distance to prevent discharge of the agent therethrough and from the dispenser during the centrifugal extraction operation but being effective to drain said agent from said dispenser at the end of the centrifugal extraction operation for use in treating the liquid in said machine during the clothes rinsing operation.

9. A liquid rinsing agent dispenser for use in a clothes container member of a washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation and having an agitator member which rotates at high speed with said clothes container member during said extraction operation, said dispenser comprising a hollow receptacle for receiving a liquid rinsing agent and for retaining said agent separate from washing liquid during the washing operation and including means for mounting the same on one of said members for rotation therewith above the clothes to be washed, said receptacle having an inner side wall, and an outer side wall, a bottom wall and a top wall portion to retain said agent in the dispenser at the outer margin thereof when impelled outwardly by centrifugal force during the centrifugal extraction operation, and discharge means located radially inwardly of said outer side wall a sufficient distance to prevent discharge of the agent therethrough and from the dispenser during the centrifugal extraction operation but being effective to drain said agent from said dispenser at the end of the centrifugal extraction operation to treat the liquid in said clothes container during the rinsing operation.

10. A liquid rinsing agent dispenser for use in a clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, and having a rotary agitator member which rotates at high speed during the extraction operation, said dispenser having means for mounting the same upon said member for rotation therewith and comprising a hollow receptacle having a compartment for initially receiving a liquid rinsing agent and for retaining said rinsing agent separate from washing liquid during the washing operation, said dispenser having an outer trough-shaped wall disposed outwardly of said compartment and opening toward the axis of rotation of said dispenser and in communication with said compartment to receive and to retain said rinsing agent by centrifugal force upon rotation of the rotary member during the extraction operation, and means in communication with the trough of said trough-shaped wall for discharging said rinsing agent by gravity into said machine at the end of the extraction operation.

11. A liquid rinsing agent dispenser for use in a clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, and having a rotary agitator member which rotates at high speed during the extraction operation, said dispenser having means for mounting the same upon said rotary member for rotation therewith and comprising a hollow receptacle having a compartment for initially receiving a liquid rinsing agent and for retaining said rinsing agent separate from washing liquid during the washing operation, said dispenser having an outer trough-shaped wall disposed outwardly of said compartment and opening toward the axis of rotation of said dispenser and in communication with said compartment to receive and to retain said rinsing agent by centrifugal force upon rotation of the rotary member during the extraction operation, and means forming an opening spaced substantially inwardly from the outermost portion of the trough for

discharging said rinsing agent by gravity through said opening into said machine at the end of the extraction operation.

12. A liquid rinsing agent dispenser for use in a clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, and having a rotary agitator member which rotates at high speed during the extraction operation, said dispenser having means for mounting the same upon said rotary member for rotation therewith and comprising a hollow receptacle having a compartment for initially receiving a liquid rinsing agent and for retaining said rinsing agent separate from washing liquid during the washing operation, said dispenser having an outer U-shaped portion opening toward the axis of rotation of said dispenser and being in communication with the compartment and receiving the liquid rinsing agent to retain said rinsing agent by centrifugal force upon rotation of the rotary member and dispenser during the extraction operation, and means defining an opening at the innermost portion of the bottom wall of said U-shaped portion and spaced substantially inwardly from the side wall of said U-shaped portion through which the rinsing agent is discharged at the end of the extraction operation.

13. A clothes washing machine adapted to proceed through a sequence of operations including a washing operation, a centrifugal extraction operation, and a rinsing operation, and including a clothes container member for receiving clothes to be washed which rotates at high speed during the extraction operation, and a dispenser, mounted for rotation with said container member above the clothes to be washed in said container member, for discharging a rinsing agent into said container member after the extraction operation to treat the liquid in said container member during the rinsing operation, said dispenser including a hollow receptacle having a compartment adapted to initially receive and to retain therein said rinsing agent during the washing operation, said dispenser having an outer portion generally U-shaped in cross-section and opening toward the axis of rotation of said dispenser and being in communication with said compartment and receiving said rinsing agent for preventing discharge of said rinsing agent by centrifugal force from said receptacle upon the rotation of said container member during the extraction operation, and outlet means for discharging said rinsing agent by gravity at the end of the extraction operation.

14. A device for dispensing liquid into an automatic washing machine having an initial washing operation and a subsequent centrifugal extraction operation for removing the wash water before a rinsing operation, said machine including an element rotating at a high speed during said extraction operation, said device comprising a container having means for mounting the same on the rotatable element for rotation therewith and having a hollow interior, and including a bottom and side walls, an upstanding baffle means on the bottom of the container and terminating in spaced relation to the top of the side walls and in radially spaced relation to the side walls forming separate inner and outer compartments, said rotating elements being adapted to support the container in a position for liquid to flow from the outer compartment of said container into the machine, means for introducing liquid into the inner compartment, means for retaining liquid in the outer compartment that is transferred thereto from the inner compartment during the extraction operation, said container having discharge openings in the bottom thereof in the outer compartment adjacent the baffle, whereby liquid will remain in the inner compartment of the container during the washing operation of the machine and will be discharged by centrifugal force over the baffle into the outer compartment of the container upon rotation of the rotating element during the extraction operation and discharge through said openings when the element stops.

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CERTIFICATE OF CORRECTION

Patent No. 2,868,006 January 13, 1959

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 50, for "in" read -- with --.

Signed and sealed this 9th day of February 1960.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON

Commissioner of Patents