

Aug. 4, 1925.

1,548,247

R. BENNETT

WASHING MACHINE

Original Filed Sept. 25, 1920 3 Sheets-Sheet 1

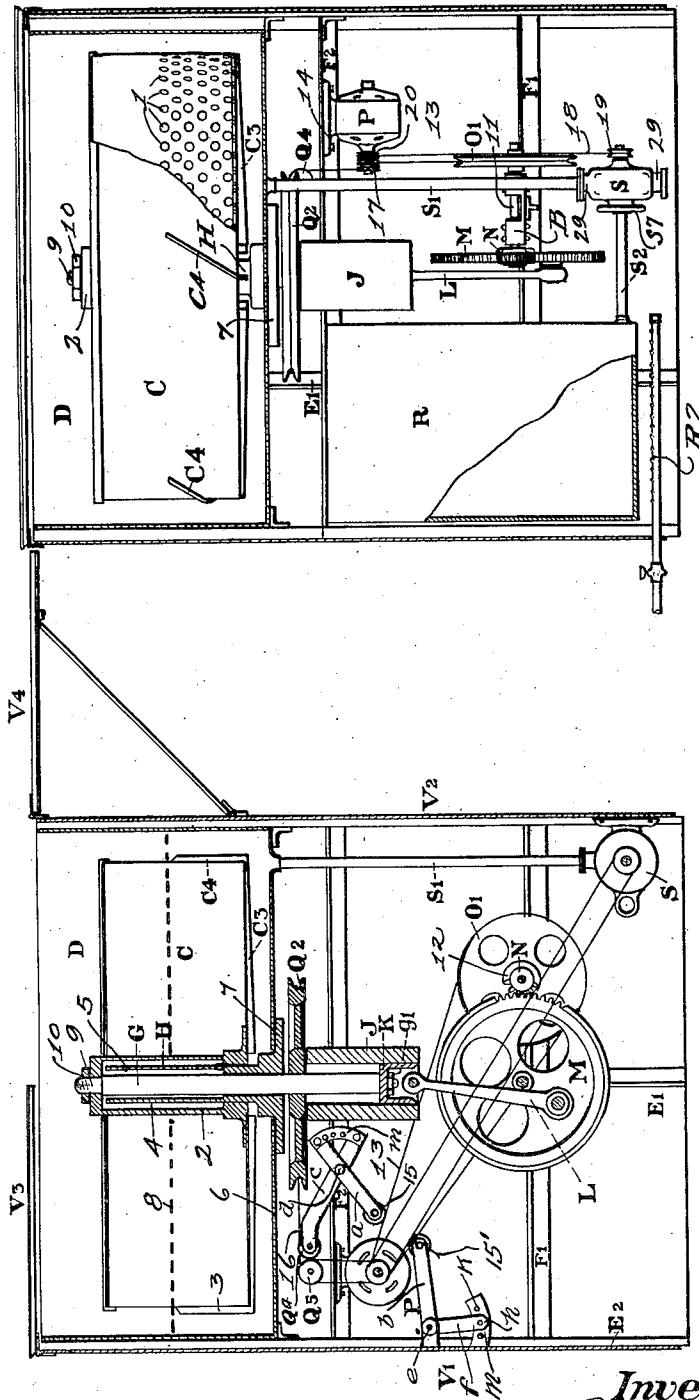


Fig. 2

Fig. 1

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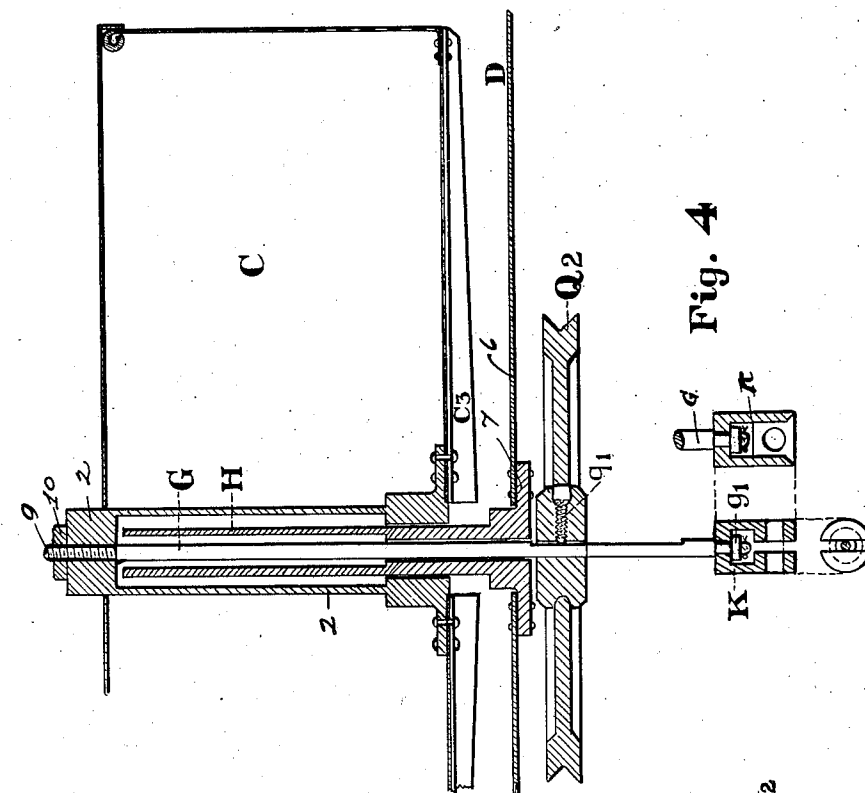


Fig. 4

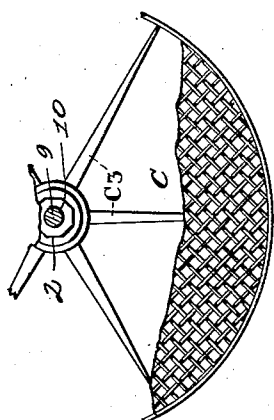


Fig. 5

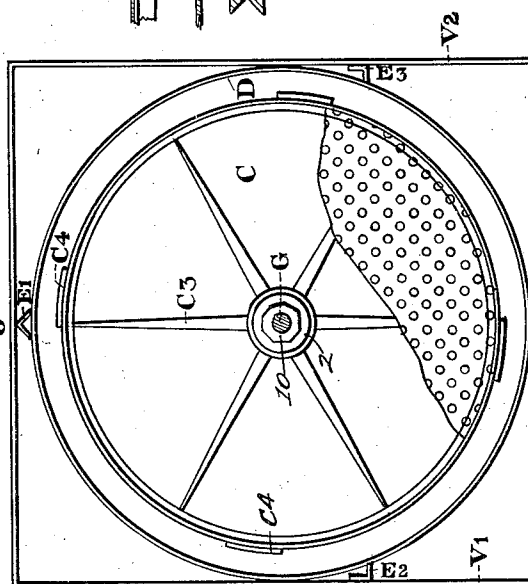


Fig. 3

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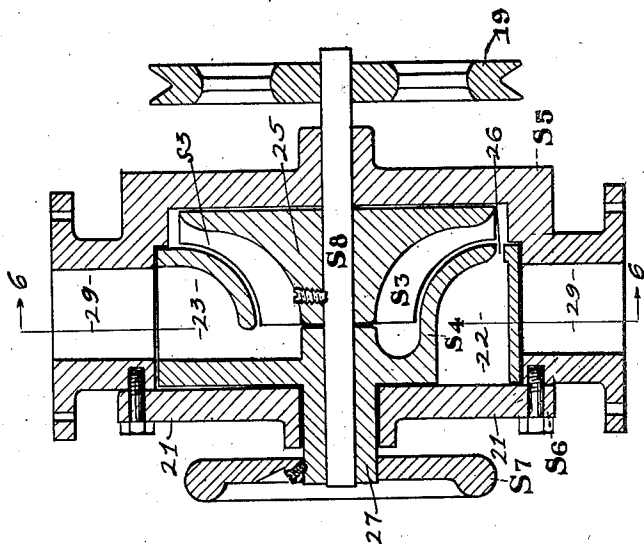


Fig. 7

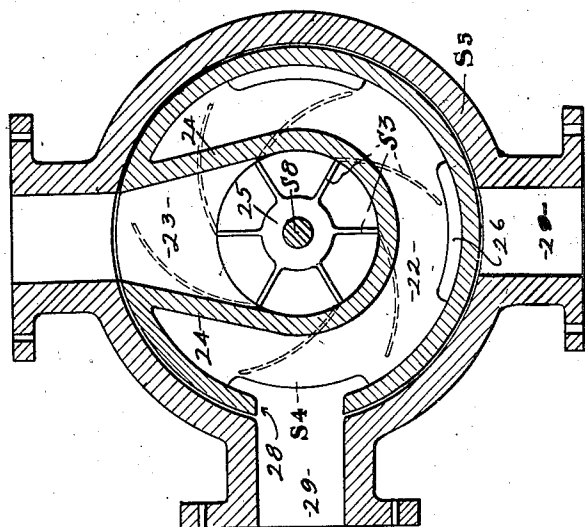


Fig. 6

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# UNITED STATES PATENT OFFICE.

RALPH BENNETT, OF LOS ANGELES, CALIFORNIA.

## WASHING MACHINE.

Application filed September 25, 1920, Serial No. 412,882. Renewed September 18, 1924.

*To all whom it may concern:*

Be it known that I, RALPH BENNETT, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Washing Machines, of which the following is a specification.

My invention relates to and has for a main object the provision of a machine for washing and drying garments and the like by means of which, in a single operation, the garments or clothes to be washed may first be thoroughly cleansed by forcing the cleansing water, or "suds" through them and finally rotating the container in which the garments are held for throwing off the water by centrifugal force and drying them.

Another object of my invention is to eliminate the handling of the garments in the drying operation and to accomplish this by mechanical means.

A further object is to provide in a washing machine means for reciprocating a container in a body of water for thoroughly cleaning and washing the garments, and thereafter to rotate the said container with the garments therein, the cleansing water having been first drained off into a suitable receptacle, for the purpose of drying the garments.

A still further object is to provide in a washing machine a tub for holding the cleansing solution, a clothes container rotatably and reciprocably held therein for supporting the clothes during the washing and drying operations and a receptacle for receiving and holding the cleansing solution during the drying operation, means being also provided for transferring the solution from the tub to the said receptacle, and vice versa.

Another object is to provide in a washing machine means whereby the same cleansing water may be used over and over again for different operations, and to this end I have provided a tub for holding water during the washing operation and a receptacle in communication therewith but separate therefrom, and means interposed in connections whereby the water may be transferred from one to the other of said elements, for the purpose described. Other objects will appear as the description progresses.

Fig. 1 is a sectional elevation of my machine.

Fig. 2 is a sectional elevation of the same at right angles to Fig. 1.

Fig. 3 is a top plane of the machine with the cover open.

Fig. 4 is an enlarged fragmentary sectional elevation of the means for reciprocating and rotating the clothes container.

Fig. 5 is a fragmentary view of a modified form of container in which wire mesh is employed in lieu of the perforated sheet metal shown in Fig. 4.

Figs. 6 and 7 are sectional elevations, in planes at right angles to each other, of a new form of pump by means of which the water is transferred from the tub to the receptacle, or vice versa.

Briefly described, my invention includes a suitable frame, having standards  $E^1$  and  $E^2$  and supports  $F^1$  and  $F^2$ ; a circular tub  $D$  mounted on the upper portion thereof, open at the top; a liquid holding receptacle  $R$  held on said frame beneath said tub; a motor  $P$ ; a clothes holder, or basket  $C$  rotatably and reciprocably held in the tub  $D$ ; a jacket, having sides  $V^1$  and  $V^2$  for enclosing all of the elements of the machine and having hinged covers,  $V^3$  and  $V^4$  and a pump  $S$  preferably supported in the position shown in Fig. 1.

Frame member  $F^2$  carries a guide element  $J$  in which a cross head  $K$  is adapted to slide and to this crosshead a spindle  $G$  is attached and extends upwardly through and into the tub  $D$ , the lower end of spindle  $G$  having a nut  $g'$  thereon within the cross head  $K$ , as shown in Fig. 1.

The holder or basket  $C$  may be made of sheet metal, the sides and bottom having perforations 1, 1, etc., therein, as shown in Figs. 2 and 3, or of wire mesh as shown in Fig. 5, as may be desired, but the character of this basket should be such as to permit a free flow of the cleansing water to and from the basket.

Basket  $C$  has a central hub 2 and supporting arms  $C^3$  on which the basket may be removably held and the outer ends  $C^4$  of said arms are bent at angles from the radial lines of the arms so as to form vanes which, when the tub is reciprocated will serve to impart an oscillatory motion thereto. This

feature may or may not be necessary but can be utilized if desired.

Hub 2 of basket C has a recess 4 and a bore 5 to receive an upwardly extending sleeve H which is held on the bottom 6 of tub D by means of a flange 7, and basket C is thus slidably and rotatably supported on said sleeve. The water level in the tub D is indicated by a line 8 and the sleeve H should extend substantially above said water level so that the water in the tub may not leak out through the spindle bearing formed by said sleeve. The upper end of spindle G is reduced at 9 and is held in the closed end of the basket hub 4 and held by means of a nut 10.

Frame member F<sup>1</sup> carries a bearing block B in which a shaft 11 is journaled and a crank gear M is fixed to one end of said shaft and meshes with a driving pinion N carried on a countershaft 12 also held on said block. Gear M is connected with cross head K by means of a connecting rod L for reciprocating the spindle G, cross head K and basket C by means of the connections described whenever the gear M is rotated.

Shaft 12 carries a sheave Q<sup>1</sup> which is operated by means of a belt from a pulley 14 connected with motor P. Motor P may be supported on frame member F<sup>2</sup> as shown, or in other suitable position, and belt 13 may have a tightener pulley 15 suitably held, for purposes hereinafter described.

Spindle G carries a sheave Q<sup>2</sup> adjacent to the top of the cross head guide J and is operated from motor P by means of a belt 16 over a pulley 17 connected with the motor P. Belt 16 also runs over a fixed pulley Q<sup>3</sup> and a tightener pulley Q<sup>4</sup> which may be adjustable as to position so as to render the sheave Q<sup>2</sup> operative or inoperative at will.

Pump S is connected with tub D by means of a pipe S<sup>1</sup> and with receptacle R by means of a pipe S<sup>2</sup> so that the water may be transferred backward and forward from one of said elements to the other at will. Said pump is operated by means of a belt 18 operating over a pulley 19 on the pump and a driving pulley 20 on the motor shaft and may also have a tightener pulley 15' for rendering the pump operative or inoperative at will.

The pump is a particular feature of my mechanism and involves certain novel and useful characteristics which I will now describe. Said pump consists of a casing S<sup>5</sup> which may have one side removable as at 21, and a shaft S<sup>8</sup> having bearings in the members S<sup>5</sup> and 21, a distributor S<sup>4</sup> fitting the bore of the casing and having an interrupted annular chamber 22 therein and an inlet passage 23 separated therefrom by walls 24 and S<sup>4</sup>, said passage extending inwardly so as to provide a substantial inlet around the axis of the shaft S<sup>8</sup>. The walls 24 and S<sup>4</sup> of

said distributor are curved and flared outwardly from the center, as shown in Fig. 7 and an impeller 25 is mounted on shaft S<sup>8</sup> between the distributor and the casing wall, as shown in Fig. 7.

The impeller has a plurality of flared and outwardly curved vanes S<sup>3</sup> formed thereon, the inner portions of which register with the mouth of the inlet 23 of the distributor, and said distributor has a plurality of outlet ports 26, 26 through which the water may be discharged at the periphery of the impeller into the chamber 22 of the distributor.

Distributor S<sup>4</sup> has a hub 27 which extends through the side 21 of the casing and carries a hand wheel S<sup>7</sup> by means of which the outlet 28 of the distributor may be made to register with any one of the plural outlets 29, 29, etc., of the casing. The inlet 23 and outlet 28 of the distributor are arranged at angles to each other, and it will be apparent that by turning the distributor by means of the hand wheel S<sup>7</sup>, the inlets and outlets may be arranged to suit. For instance, when the water is being transferred from the tub D to receptacle R the uppermost outlet 29 of the drawings may be used as an inlet and the relatively right angular outlet 29 used as an outlet for delivering the water to said receptacle through pipe S<sup>2</sup>.

The belt tighteners 15, 15' and Q<sup>4</sup> may be adjustably held relative to their respective belts, as shown in Fig. 1, on arms a, b, and c, which are suitably pivoted on the frame at points d and e, and may be held in selected positions by means of shorter arms f, f, which carry pins h, h, adapted to seat in the perforations k, k, formed in sectors m, m, suitably attached to the frame, or otherwise, the particular form of these devices being immaterial to my invention.

When water is returned to tub D for use the distributor is adjusted so that the inlet passage 23 registers with the passage on the horizontal center line of the casing and connected with pipe S<sup>2</sup> and the water will be discharged through another of the passages 28 of the distributor which is made to register with the topmost passage of the casing connected with the pipe S<sup>1</sup>. The arrangement of the outlets in the casing, the outlets in the distributor and the ports in the distributor may be made to meet varying conditions and requirements and more or less may be provided if necessary.

In operation, the clothes are placed in the basket C and the motor P started. Pulley 15 is adjusted for tightening the belt 13 and pulleys 21 and Q<sup>4</sup> are disengaged from their belts, so that the reciprocating mechanism only will be operative, and the basket is thus reciprocated to a desired extent through the means described, the water being forced into and from the basket and into contact with the clothes therein until all of the clothes are

thoroughly cleaned. Thereupon, the water is drained from the tub D through pipes S<sup>1</sup> and S<sup>2</sup> and pump S into receptacle R, said pump having been first rendered operative by the adjustment of its tightener pulley 21 with belt 18.

Pulley Q<sup>4</sup> is then adjusted for engagement with belt 16 and sheave Q<sup>2</sup> and spindle G are then rotated for rotating the basket C with the clothes therein until the water shall have been partially extracted therefrom, after which the clothes may be removed and another operation may follow.

I have shown in Fig. 2 a gas heater R<sup>2</sup> beneath the receptacle R so that the water which is transferred from tub D thereto during each operation may be reheated for subsequent use. The tub D being higher than the receptacle R, the water may be drained off by gravity to receptacle R, or the pump may be operated for accelerating the flow of the water. Of course when the water is returned to the tub it will be necessary to use the pump to lift the water to the tub.

While not entirely essential, the water level in the tub should be such that the basket of clothes will be raised out of the water at each reciprocation thereof, for the purpose of providing a thorough aeration of the clothes.

The adjustment of the distributor of the pump, in the manner hereinbefore described will also serve to close communication between the tub and receptacle when the water is to be held in either of said members, and said pump must be adjusted at each operation for effecting the flow of the water therethrough in the proper direction.

I may modify and alter arrangement and structure of my mechanism within the scope of the appended claims without departing from the spirit of my invention.

What I claim is:

1. A washing machine comprising a frame, a housing inclosing said frame, a receptacle stationarily held in the upper portion of said housing and open at the top, said receptacle having a central sleeve fixed thereto at the bottom, and extending substantially upward therefrom, a pervious receptacle concentrically mounted in said stationary receptacle and having its walls spaced therefrom and provided with diagonally disposed vanes on the exterior thereof, a hollow hub fixed to the bottom of said pervious receptacle and extending upwardly therefrom for inclosing said sleeve, a bearing on said frame concentric with said receptacles, a shaft rotatably and slidably held in said bearing and in said sleeve and

fixed at its upper end to the hub of said pervious receptacle, means for rotating and reciprocating said shaft and said pervious receptacle at will, and means for filling said stationary receptacle with and discharging a liquid therefrom.

2. A washing machine comprising a frame, a housing inclosing said frame, stationary and movable receptacles in the upper portion of said housing, concentrically arranged, said movable receptacle being pervious and said stationary receptacle being impervious, concentric hub members on said receptacles telescopically arranged, a motor, gearing driven by said motor, operably connected with the hub of said pervious receptacle, and means also operated by said motor whereby said pervious receptacle may be reciprocated during the rotation thereof, at will.

3. A washing machine comprising a frame, a housing inclosing said frame, stationary and movable receptacles in the upper portion of said housing, concentrically arranged, said movable receptacle being pervious and said stationary receptacle being impervious, concentric hub members on said receptacles telescopically arranged, a transmission device operably connected with the hub of said pervious receptacle, whereby said pervious receptacle may be rotated at will, motor operated means for reciprocating the same, a storage reservoir mounted in the lower portion of said housing and connected with said stationary receptacle, and a pump whereby the washing liquid may be transferred from said receptacle to said reservoir, or vice versa, at will, for the purpose described.

4. A washing machine comprising a frame, a housing inclosing said frame, stationary and movable receptacles in the upper portion of said housing, concentrically arranged, said movable receptacle being pervious and said stationary receptacle being impervious, concentric hub members on said receptacles telescopically arranged, a transmission device operably connected with the hub of said pervious receptacle, whereby said pervious receptacle may be rotated at will, motor operated means for reciprocating the same, a storage reservoir mounted in the lower portion of said housing and connected with said stationary receptacle, a pump whereby the washing liquid may be transferred from said receptacle to said reservoir, or vice versa, at will.

RALPH BENNETT.

Witnesses:

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LUTHER L. MACK.