

March 25, 1930.

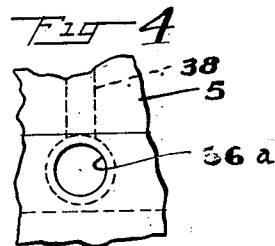
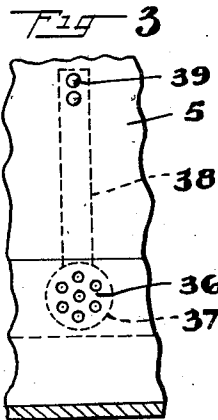
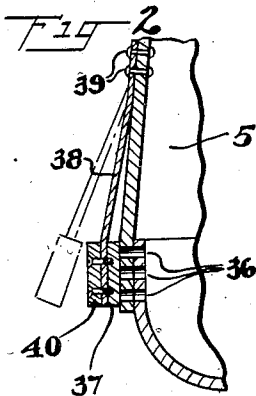
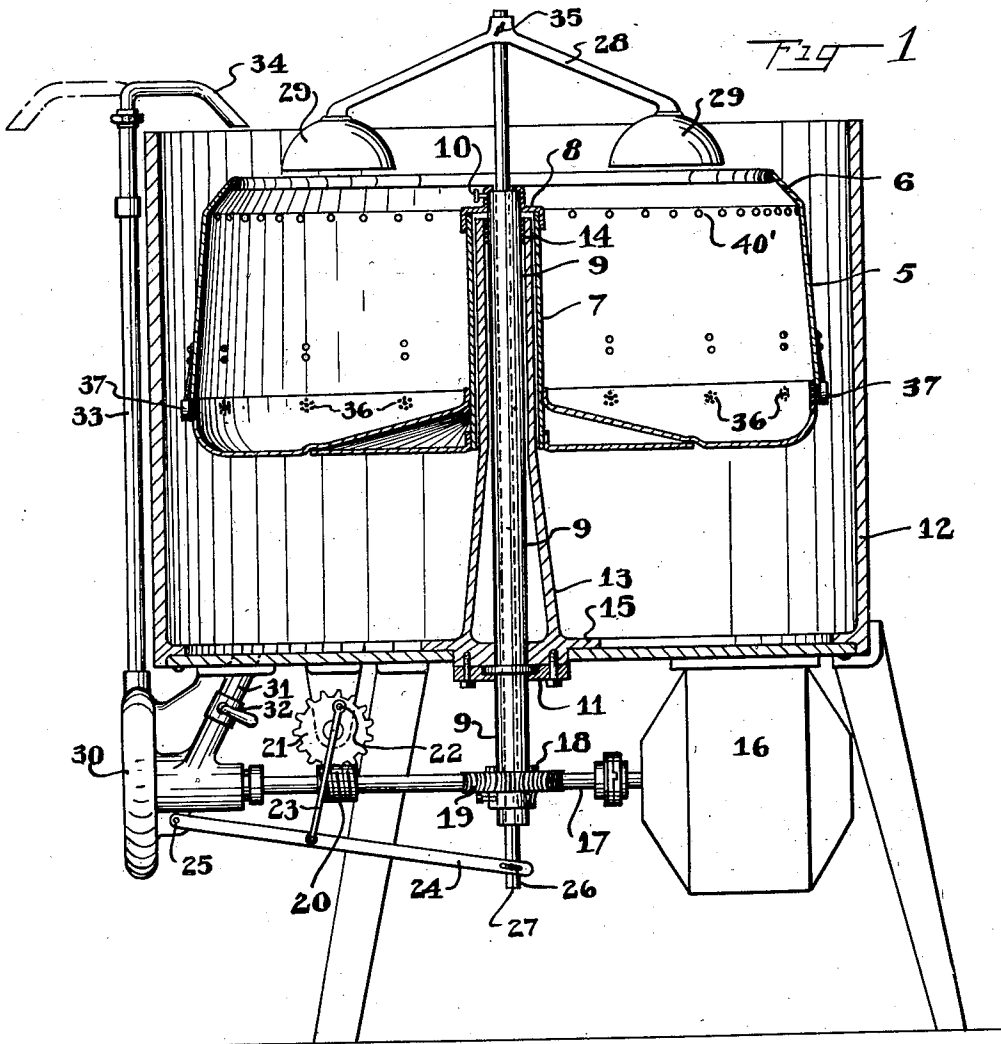
G. W. DUNHAM

1,751,982

WASHING AND DRYING MACHINE

Filed Nov. 15, 1924

2 Sheets-Sheet 1



INVENTOR
George W. Dunham
BY
Albert M. Austin
ATTORNEY

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G. W. DUNHAM

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2 Sheets-Sheet 2.

Fig 6

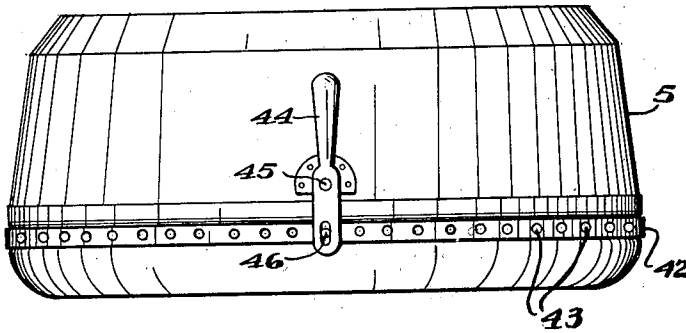


Fig 7

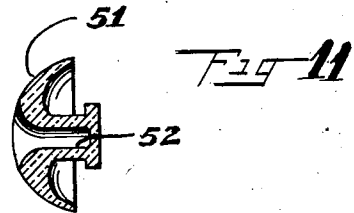
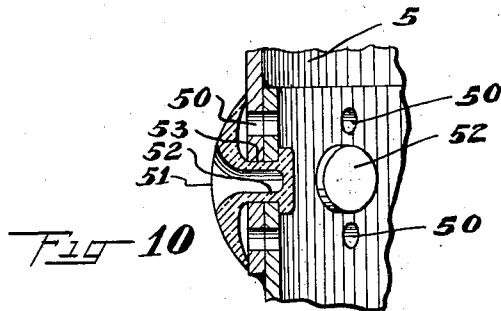
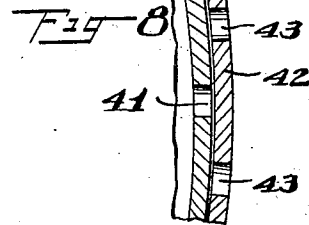
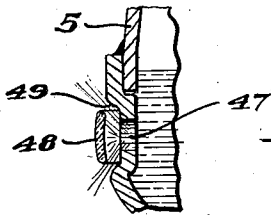
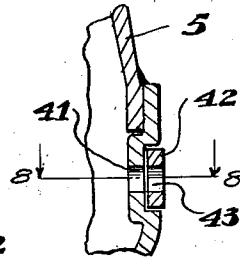
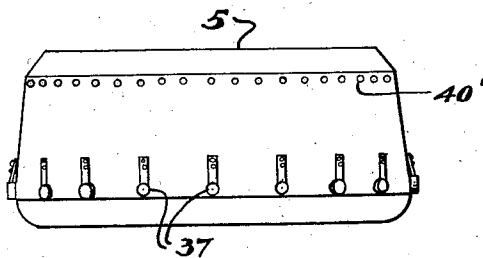


Fig 5



INVENTOR
George W. Dunham
BY
Albert M. Austin
ATTORNEY

UNITED STATES PATENT OFFICE

GEORGE W. DUNHAM, OF UTICA, NEW YORK, ASSIGNOR TO WHIRLDRY CORPORATION,
OF UTICA, NEW YORK, A CORPORATION OF NEW YORK

WASHING AND DRYING MACHINE

Application filed November 15, 1924. Serial No. 750,035.

This invention relates to improvements in laundry apparatus and particularly to washing and drying machines for domestic use.

The objects of the invention primarily are to provide a practical and efficient machine which can be used for both washing and drying purposes without need for shifting the clothes or the receptacle in which they are contained.

In the attainment of the foregoing and other desirable results, a single washing receptacle is used and the effects of centrifugal force are utilized to accomplish the emptying of this receptacle of the liquid contents for drying operations.

The present invention therefore is similar in a broad sense to my co-pending application, Serial #733,482, in the utilization of centrifugal force for emptying the washing receptacle, but differs therefrom in that where in that case the discharge openings were placed above the normal liquid level and the centrifugal effect was to crowd the liquid up the walls of the receptacle and through said higher openings, in the present case, the centrifugal effect is employed to discharge the liquid through valves which remain closed against the weight of the liquid during normal washing operations.

Various other novel features of the invention will appear as the specification proceeds.

In the drawing accompanying and forming part of the specification the invention is illustrated in certain preferred forms, but it should be understood that the structure may be varied without departure from the broad spirit and scope of the invention as hereinafter defined and claimed.

Figure 1 is a vertical sectional view of the machine with the centrifugally opening valves shown closed, as they are during the washing operation.

Figure 2 is an enlarged sectional fragment of the clothes receptacle illustrating how the valves swing open under the influence of centrifugal force to discharge the liquid contents of the receptacle.

Figure 3 is a fragmentary detail of the valve structure as it appears from the inside of the receptacle.

Figure 4 is a similar view illustrating as a modification, a drainage outlet formed as a single larger opening instead of a series of small strainer openings as in the first form illustrated.

Figure 5 is a detached view of the clothes container.

Figure 6 is a similar view of a modified form of container, and Figures 7 and 8 are sectional views of same, the latter taken on line 8—8 of Figure 7.

Figures 9, 10 and 11 are sectional views of two other modifications.

In the first form of apparatus illustrated, the receptacle 5 for the washing liquid and the clothes, or other articles to be treated, is of generally truncated conical form having its greatest diameter at the bottom and having upwardly convergent sides terminating at the top in an inwardly extending guard rim or flange 6. This receptacle is supported by a central tubular column 7 having a shouldered cap 8 at the top engaged over the upper end of a tubular drive shaft 9 and releasably secured in driven relation thereto by a clamp screw 10.

This drive shaft is supported in a step bearing 11 on the base of the container or tank 12 and is surrounded by a tubular post or column 13 rising from the bottom of the tank and having a bearing 14 at its upper end for steadying the upper end of the receptacle rotating shaft. A practical method of constructing these several parts is to provide the base of the tubular column with an annular flange, as shown at 15, secured on the bottom of the container and to secure the step bearing directly to the lower end of the column.

The power for driving the receptacle is supplied in the present disclosure by an electric motor 16, coupled to a shaft 17 carrying a worm or spiral gear 18 in mesh with a corresponding worm gear or spiral gear 19 secured to the lower end of the shaft 9.

This same power is also shown as utilized for actuating the washing mechanism by providing on the shaft 17, a worm 20 engaging a worm gear 21 carrying a crank pin 22 connected by a link 23 with a lever 24 pivoted at one end at 25 and having a reciprocal connection

tion at its opposite end at 26 with a shaft 27 extending up through the tubular drive shaft 9 and carrying a spider 28 provided with vacuum cups 29.

5 The shaft 17 is furthermore shown as driving the impeller of a pump 30, having its intake 31 connected with the bottom of the container and controlled by a valve 32 and having its discharge side connected with a riser 33 extending up at the side of the container and
10 equipped at the upper end with a swiveled nozzle 34 which can be turned to throw the liquid back into the receptacle, into the container or clear of both.

15 The spider which carries the vacuum cups is shown as detachably secured at 35 so that this portion of the washing apparatus may be removed when the clothes are being placed in the receptacle or after the washing is finished,
20 preparatory to drying operations.

The clothes receptacle is closed against the discharge of the washing liquid during washing operations, but is automatically opened to discharge the liquid contents, for drying,
25 by providing it at substantially the greatest diameter, in this case, adjoining the bottom, with a row of discharge outlets 36 covered at the outside by valves or closures 37, capable of yielding and opening outwardly under the influence of centrifugal force. These effects
30 are obtained in the illustration by mounting the closures on the lower ends of spring strips 38 arranged substantially vertically and secured at their upper ends at 39 on the outside
35 of the convergent side wall above the outlets.

These springs are relatively stiff so as to hold the closures firmly seated against the weight of the liquid contents of the receptacle while the receptacle is stationary or rotating
40 slowly during washing operations and to increase the centrifugal effect and make the opening of the valves more certain, they may be weighted as shown in Figure 2, by attaching weighting discs 40 over the outside of the
45 spring strips in position overlying the closure pads 37 secured at the inside of such spring strips.

To hold back the clothes or other articles and prevent the same from interfering with
50 proper operation of the automatic discharge valves, the valve outlets may each consist of a series of closely grouped small size strainer openings, as indicated most clearly in Figures 2 and 3. Each group of such openings collectively allows for ample flow of liquid but
55 by reason of the small size of the individual openings the clothes or other articles are held back so that they will not become torn or interfere with the action of the valves. In some instances, it is possible to make each discharge outlet as a single relatively large opening, as indicated at 36^a in Figure 4, in which case the valve pad cooperates with a single
60 large opening instead of a group of smaller strainer size openings.

During the washing action the receptacle is uncoupled or freed from its driving means by releasing screw 10 and therefore holds the washing liquid as a closed receptacle. When the drying operations are to be effected, the receptacle is coupled to its driving means by tightening the clamp screw 10 on the drive shaft 9 and is then rotated at speed sufficient to generate the centrifugal force necessary to swing the spring tensioned closures outwardly as in Figure 2 and thus discharge the liquid contents. The tendency of the clothes to work upwardly during the centrifugal drying operations is overcome by the upwardly convergent side wall and the overstanding clothes confining rim 6. As the centrifugal discharge valves are located at the point of greatest diameter in the receptacle, all liquid will be carried by centrifugal action to the greatest diameter and so be discharged through the outlets. The construction of the receptacle with its greatest diameter at the bottom has a further advantage in that the center of gravity is lowered and better balance is obtained when rotating at centrifugal discharging speed. The centrifugal opening effect of the valves is increased by securing the spring valve strips on the convergent wall of the receptacle with said strips inclined outwardly toward their free ends.

A row of overflow holes 40' may be provided near the top of the container at the base of the inwardly inclined flange so that the water will not flow over the extreme top and thus carry light fabrics such as handkerchiefs or the like over the edge of the container.

In Figures 6, 7 and 8, the discharge outlets 41 are shown as controlled by an encircling valve band 42 having openings 43 to register with the discharge openings and adapted to be shifted from closed to discharge positions, or vice versa, by a handle lever 44 pivoted on the side of the container at 45 and having a loose pivotal connection with the band at 46.

In Figure 9 the discharge openings 47 are controlled by an encircling elastic band 48 normally seating in a groove 49 but adapted under centrifugal force to yield outwardly sufficiently to uncover the openings 47 for discharge purposes.

A similar effect is provided in Figures 10 and 11 by covering the openings 50 with dome shaped elastic buttons or valve members 51 held in place by tubular headed shanks 52 seated in openings 53 provided in the walls of the container. The tubular construction enables the shanks of these elastic valve members being forced through the seat openings 53, in which position the flanged heads will cover the discharge outlets. Under centrifugal operation, the flanged heads of these valves will be lifted by the force of the

water, permitting automatic centrifugal discharge of the same.

What is claimed is:

1. In a washing machine, a clothes receptacle having a number of drainage outlets in the side of the same, spring strips secured to the receptacle, closures carried by said spring strips over the openings and means for rotating the receptacle to swing the closures open against the tension of the spring supporting strips.

2. In a washing machine, a clothes receptacle having a drainage outlet in the side of the same, a spring strip secured on the outside of the receptacle, a closure carried by said spring strip over the drainage outlet and means for rotating the receptacle at speed to overcome the tension of said spring strip and effect centrifugal opening of the closure.

3. In a washing machine, a clothes receptacle having an opening in the side of the same, a spring strip secured on the outside of the receptacle and a closure for the opening carried by the free end of said spring strip.

4. In a washing machine, a receptacle having discharge outlets in the side of the same, spring strips secured to the receptacle above said outlets and closures carried by said spring strips and normally held thereby engaged over said outlets.

5. As an article of manufacture, a washing receptacle having discharge outlets in the side of the same, outwardly opening closures for said outlets and spring strips yieldingly supporting said closures over the outlets.

Signed at Utica, in the county of Oneida and State of New York, this 23d day of Sept., A. D. 1924.

GEORGE W. DUNHAM.