March 9, 1943. E. W. FORNEY 2,313,634

WASHING MACHINE

Filed Oct. 30, 1941 2 Sheets-Sheet 1

FIG. 1.

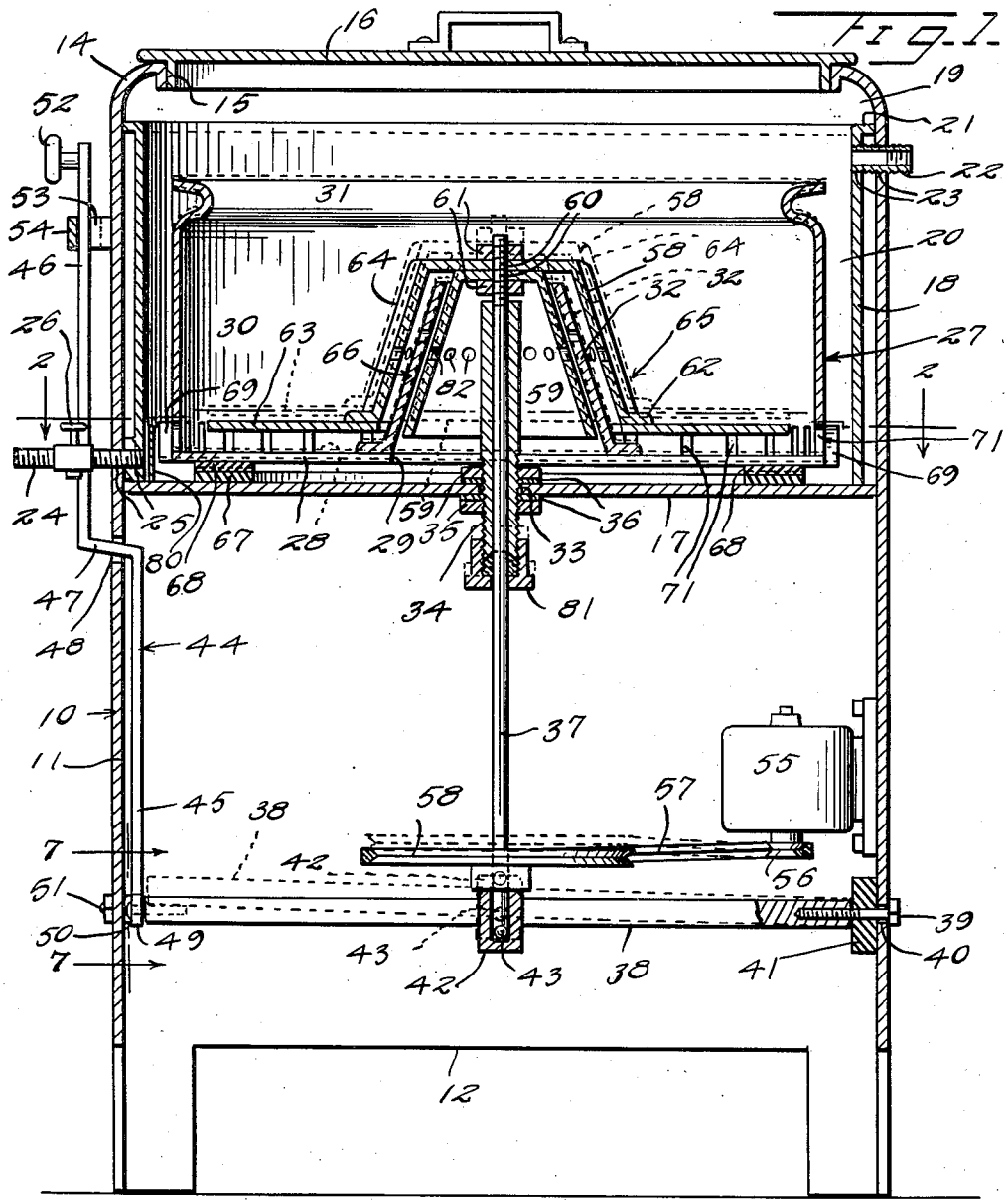


FIG. 7.

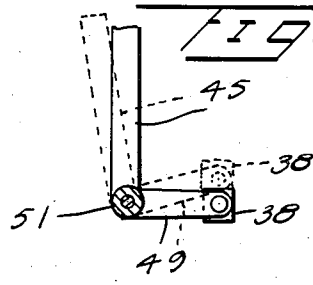
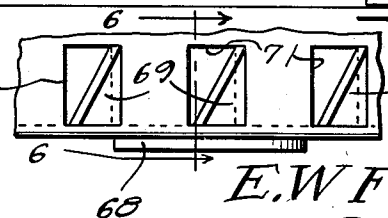


FIG. 5.



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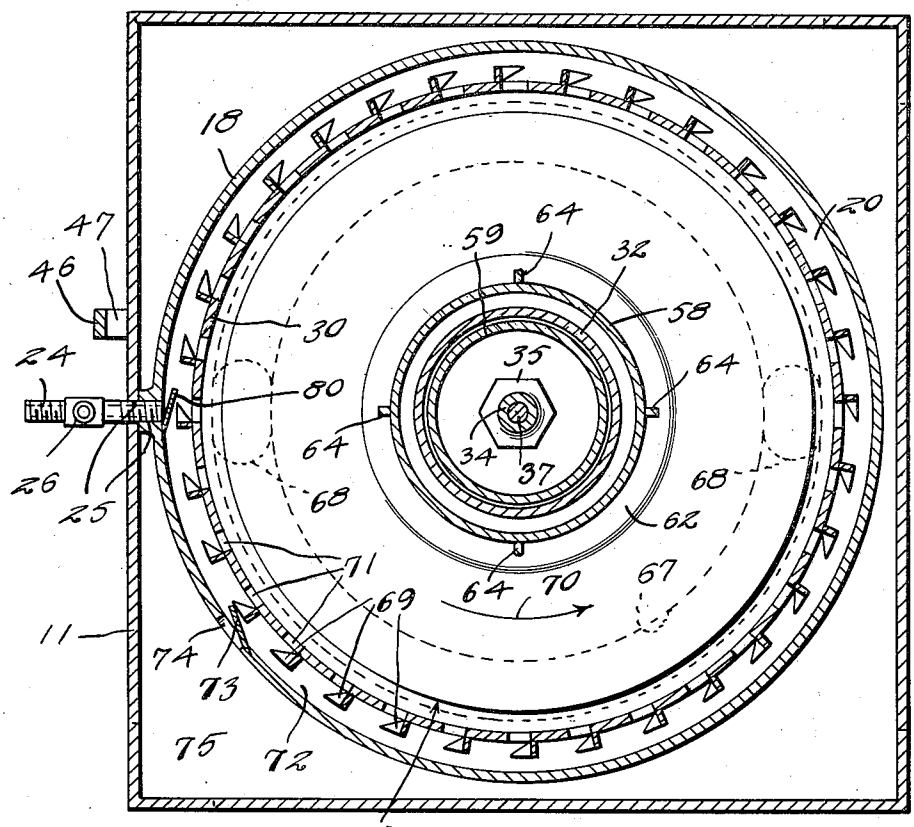


Fig. 2.

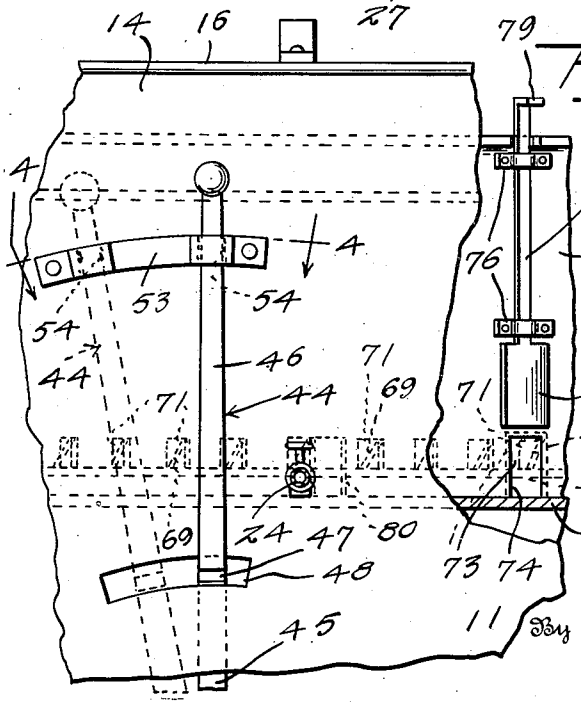


Fig. 3.

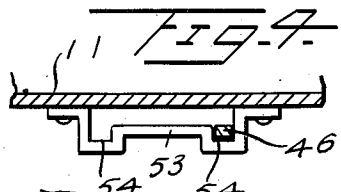


Fig. 4.

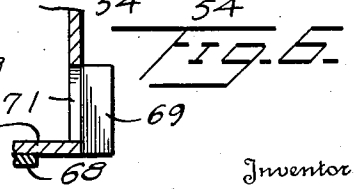


Fig. 6.

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Patented Mar. 9, 1943

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UNITED STATES PATENT OFFICE

2,313,634

WASHING MACHINE

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Application October 30, 1941, Serial No. 417,200

5 Claims. (Cl. 68—23)

This invention relates to an improved construction of machine for washing, rinsing and drying clothes.

More particularly, it is the aim of the invention to provide a washing machine of very simple construction capable of being economically manufactured and sold and comprising a very few number of parts which combine to form a very efficient and durable machine.

More particularly, it is the aim of the invention to provide a washing machine having means whereby the soapy water, used for washing the clothes, can be pumped into a storage chamber or compartment and clear water can then be placed in the washing bowl and used for rinsing the clothes, after which said clear water can be pumped out of the machine, clothes dried by being revolved, and the clothes thereafter removed and another batch of clothes, to be washed, can then be placed in the clothes bowl, after which the stored soapy water can be released back into the washing chamber and the operation repeated.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, which illustrate a preferred embodiment thereof, and wherein:

Figure 1 is a substantially central vertical sectional view, partly in elevation, of a washing machine constructed in accordance with the invention,

Figure 2 is a horizontal sectional view of the same taken substantially along a plane as indicated by the line 2—2 of Figure 1,

Figure 3 is a fragmentary side elevational view, partly broken away, and showing a portion of the machine,

Figure 4 is a sectional view taken substantially along the plane of the line 4—4 of Figure 3,

Figure 5 is an enlarged fragmentary side elevational view of a portion of the side wall of the clothes bowl or tub,

Figure 6 is a vertical sectional view taken substantially along the plane of the line 6—6 of Figure 5, and

Figure 7 is an enlarged vertical sectional view taken substantially along the plane of the line 7—7 of Figure 1.

Referring more particularly to the drawings, wherein like reference characters designate like or corresponding parts throughout the different views, 10 designates generally a washing machine in its entirety and which includes a casing which is substantially square in cross sections, as seen at 11, and which is provided with an open bottom 12. The casing 11 is provided with depending legs 13 at the corners thereof. The side walls of the casing 11 are turned inwardly, as seen at 14, at their upper edges to form the open top 15 of the casing 11 which is adapted to be closed by means of a removable cover or lid 16. The casing 11 is provided with elevated bottom 17, which is disposed substantially above the open bottom 12 thereof.

The annular wall 18 is disposed in the upper portion 19 of the casing 11 and has its lower edge secured to the upper side of the bottom 17 to form the chamber or tank 20 having a common bottom with the upper casing portion 19. The annular wall 18 is provided with an outwardly projecting flange 21, portions of which engage the side walls of the casing 11, intermediate of the longitudinal edges of said walls, to hold the cylindrical wall 18 in spaced relationship to side walls of casing 11, as seen in Figure 2. A nipple 22 threadedly engages alined openings 23 in the casing 11 and wall 18 to provide a fitting through which a hose, not shown, can be attached for filling or partially filling the chamber 20 with water. A conduit 24 has a threaded end engaged with threaded openings 25 and said end opening into chamber or tank 20. The conduit 24 is disposed adjacent the bottom of the tank 20 and the nipple 22 is disposed adjacent the top thereof. Conduit 24 is provided with a conventional shut-off valve 26 and its opposite, outer end is adapted to be connected to a drainage hose, not shown, for draining the water from the washing machine, as will hereinafter become apparent.

A clothes bowl or tub 27 is loosely disposed within the tank 20 and includes a substantially flat bottom 28, which is provided with a central opening 29, and an annular upwardly extending side wall 30 which is provided with an inwardly flared rim 31. The conical shaped wall 32 is secured to the upper side of the bottom 28, around its opening 29, and extends upwardly and inwardly therefrom. Bottom 17 is provided with a threaded opening 33, which is threadedly engaged by the lower, externally threaded end of an elongated sleeve 34. Said end carries lock nuts 35 for engaging above and below the bottom 17, and washers 36, which are disposed between the nuts 35 and the bottom 17 to provide a liquid-tight seal. A driven rotary shaft 37 is journaled in the sleeve 34, which forms the bearing thereof. A bar 38 extends across the lower part of the casing 11 and is fastened to one side wall thereof, at one end of the bar, by means

of a headed fastening 39 which extends loosely through an opening 40 in the casing and which is threaded into said end of the bar 38. A block 41 of yieldable material, such as rubber, is disposed between said end of the bar 38 and said side of the casing 11 to cushion the bar and to permit a limited pivotal movement thereof. Bar 38 is provided, intermediate of its ends, with an upwardly opening socket type bearing 42 in which the lower end of the shaft 37 is loosely journaled and which is preferably provided with a ball bearing 43 on which the lower end of the shaft 37 rests.

An elongated lever 44 has offset ends 45 and 46 connected by a portion 47, which is angularly disposed relatively to the portions 45 and 46. One side wall of the casing 11, as best seen in Figure 3, is provided with an arcuately shaped slot 48 in which the portion 47 is loosely disposed to position the upper lever portion 46 on the outer side of the casing 11, and the lower lever portion 45 on the inner side thereof. Portion 45, as best seen in Figure 7, is provided with an angular extension 49 at its lower end, which is pivotally connected by means of a pin 50 at its terminal end to the opposite, free end of the bar 38. The lever portion 45 is pivotally connected to the casing 11 by means of a nut bolt fastening 51 at its apex. A knob 52 projects outwardly from the upper end of the lever 44. Referring to Figure 4, a bar 53 is secured at its ends to the outer side of said aforementioned side of the casing 11 and has an intermediate portion which is offset outwardly therefrom and which is shaped to form notches 54 in the ends thereof. Upper portion 46 extends through a space between the intermediate portion of the bar 53 and the casing 11 and is adapted to normally engage one of the notches 54 for holding the lever in either its full line or its dotted line position of Figure 3, for a purpose which will hereinafter be described.

A conventional electric motor 55 is preferably fastened to the inner side of the lower portion of the casing 11, above the bar 38. However, if desired, motor 55 could be mounted on the bar 38. A driven shaft of the motor 55 is provided with a pulley 56 which is connected by means of a belt 57 to a larger pulley 58 which is keyed to the shaft 37, for revolving the shaft 37. If desired, the shaft 37 could be coupled direct to the driven shaft of the motor 55, with said motor mounted in the same manner as shown in my United States Letters Patent No. 2,264,202, granted on November 25, 1941.

An inverted cone shaped member 58 is connected at its center to the upper end of the shaft 37 and a smaller cone shaped member 59 is disposed in the cone shaped member 58 and is likewise connected at its center to the upper portion of the shaft 37. The upper end of the shaft 37 is threaded to engage threaded openings 60 in the members 58 and 59 and carries lock nuts 61 for clamping said members securely to one another and for holding them in adjusted positions relatively to the shaft 37. It will thus be readily apparent that the conical members 58 and 59 may be raised or lowered relatively to the shaft 37 and to the casing portion 19. The conical wall 32 is disposed between and spaced from the conical walls of the members 58 and 59. The lower end of the conical member 58 is provided with a flange 62, which fastens to a ring 63 which is disposed around the conical wall 32. Ring 63 is disposed above and spaced from the bottom 28. The conical wall of member 58 is provided on its outer side with a plurality of longitudinally extending ribs 64, which combine with the member 58 and ring 63 to form an agitator, designated generally 65, which is disposed in the bowl 27. The conical member 59 and the conical shaped wall 32 combine to form a cone clutch, designated generally 66, for a purpose which will hereinafter be described.

A ring 67 of rubber or the like is secured to the upper side of the bottom 17 and a plurality of pads 68, of a similar material, are secured to the under side of the bottom 28 and disposed to rest on the ring 67 for supporting the bowl 27 in the position, as seen in full lines of Figure 1.

Wall 30, adjacent its lower edge, is provided with a plurality of struck out portions forming vanes 69 which extend into the space between the walls 30 and 18 and which are twisted from their upper to their lower ends, as best seen in Figure 5, so that their upper ends are disposed forwardly of the lower ends and in the direction of movement of the bowl 27, as indicated by the arrow 70 in Figure 2. The vanes 69 form openings 71 in the wall 30 which communicates with the space 72, between walls 18 and 30. The wall 18 is provided with a struck out portion forming a baffle 73 which extends into the space 72 and in a direction opposite to the direction of rotation of the bowl 27. Baffle 73 forms an opening 74 between the space 72 and the space 75, between the casing 11 and wall 18. Wall 18, on its outer side, carries guides 76 which slidably engage the shank 77 of a gate valve 78 which is movable into a position to close the opening 74. Shank 77 is provided with a handle 79, at its upper end, by which the valve can be moved to a lower, closed position, or a raised, open position. A baffle 80 projects from the wall 18 into the space 72, in the same direction as the baffle 73 and is disposed adjacent the conduit 24.

The casing portion 19 is adapted to be filled through the nipple 22 with soapy water to a level below the level of the upper end of the bearing 34 and the gate valve 78 is opened so that the bowl 27 and the spaces 72 and 75 will be filled with the soapy water to a uniform level. A stuffing box 81 is mounted on the lower end of the bearing 34 to provide a water-tight connection, should the water reach the upper end of the bearing. Lid 16 is removed and the bowl 27 is filled with clothes, not shown, to be washed. With the parts in the position as seen in Figure 1, motor 55 is operated to drive the shaft 37 which will revolve the agitator 65 for washing the clothes. After the clothes have been thoroughly washed, lever 45 is moved from its full line to its dotted line position of Figure 3 to raise the bar 38 and the shaft 37. This will move the clutch element 59 into engagement with the clutch element 32 to clutch the bowl 27 to the shaft 37 and to raise the bowl sufficiently, as seen in dotted lines in Figure 1, to disengage the pads 68 and the ring 67. This will cause the bowl to revolve with the shaft and agitator. Assuming that the valve 26 is closed, the water in the bowl 30 will be directed outwardly through the openings 71 by centrifugal force and will be directed outwardly and downwardly by the vanes 69 and forced through the opening 74 into the storage space 75. When the water has been thus removed from the bowl 27, valve 78 is closed and the bowl can be revolved until the clothes have been practically dried centrifugally. If, while the bowl 27 is revolving, the clothes should accumulate in one part thereof, the weight of the

clothes will cause the clutch member 32 to crawl up the clutch member 59 to cause said parts to slip to slow down the speed of rotation of the bowl to indicate to the operator that the clothes should be redistributed therein. In order to prevent the clutch 66 from grabbing, members 32, 58 and 59 are provided with openings 82 to admit soapy water to the engaged places of the clutch for lubricating said places. Before the drying operation, and after the wash water has been stored in the space 75, rinsing water can be placed in the tank and bowl and the bowl released and the agitator revolved for rinsing the clothes. The bowl 27 can then be again revolved and the valve 26 opened so that the vanes and centrifugal force will pump the rinse water out through the conduit 24. After the clothes have been washed, rinsed and dried, they are removed from the bowl 27 and another batch of clothes can then be placed therein. The valve 78 is then opened to permit the washing water to return to the bowl and tank and the operation is then repeated.

If desired, the wall 18 could be connected to sides of the casing 11, where it approaches said sides, to form four storage spaces in the corners of the casing portion 19. In this case, each storage compartment or space would have to be provided with an opening 74 and a valve for controlling the opening.

Various other modifications and changes are contemplated and may obviously be resorted to, provided they fall within the spirit and scope of the invention as hereinafter defined by the appended claims, as only a preferred embodiment of the invention has been disclosed.

I claim as my invention:

1. A washing machine comprising a casing, a chamber disposed in and spaced from the wall of the casing, a tub loosely disposed in the chamber, means for revolving the tub, said tub being provided with a side wall having openings adjacent the bottom thereof, vanes projecting outwardly from said wall so that when the tub is revolved, water contained in the tub, will be forced outwardly through said openings, said chamber having a wall provided with an opening through which the water is pumped by the vanes into the space between the casing and chamber, and a valve for closing said last mentioned opening for holding the water stored in said space.

2. A washing machine as in claim 1, said last mentioned opening being disposed adjacent the bottom of the chamber and casing, and a baffle projecting inwardly from the chamber wall for directing the water toward the opening thereof.

3. A washing machine as in claim 1, and a conduit extending through the casing through the chamber wall and opening into a space between the chamber and tub, said conduit being provided with a shut-off valve, and such shut-off valve being adapted to be opened so that the water will be pumped by the vanes outwardly through said conduit for emptying the tub and chamber.

4. A washing machine as in claim 1, said casing being substantially square and having a bottom, said chamber comprising an annular wall disposed in the casing and secured to the bottom thereof.

5. A washing machine as in claim 1, said vanes being struck out from the wall of said tub to form the openings thereof and being twisted from their upper to their lower ends so that their upper ends will be in advance of their lower ends, when the tub is revolved, causing the vanes to direct the water outwardly and downwardly toward the chamber opening.

ELBRIDGE W. FORNEY.