

Nov. 1, 1932.

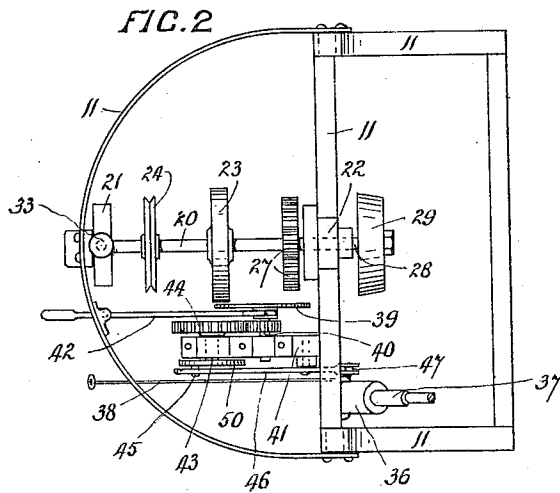
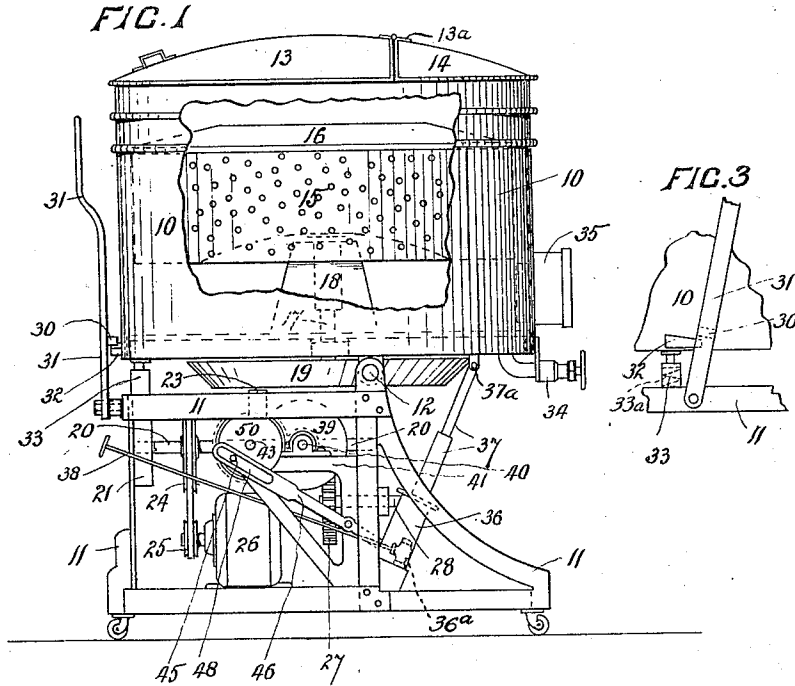
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1,886,201

WASHING MACHINE

Filed March 8, 1929

2 Sheets-Sheet 1



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FIG. 4

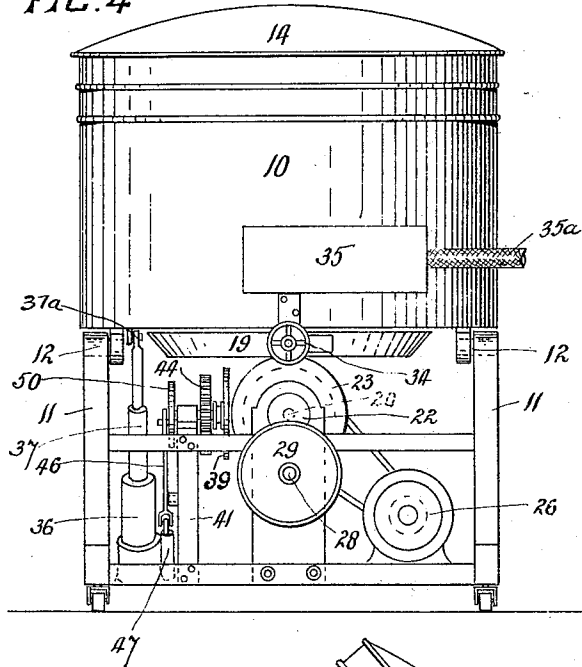
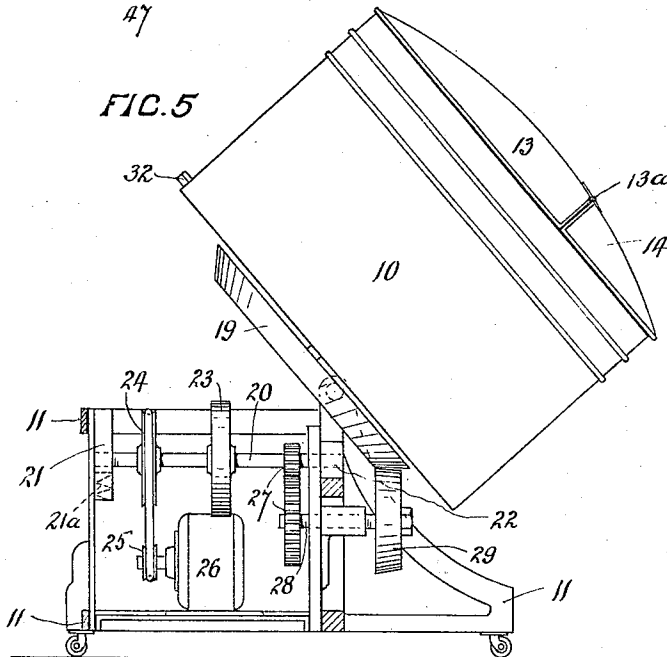


FIG. 5



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UNITED STATES PATENT OFFICE

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WASHING MACHINE

Application filed March 8, 1929, Serial No. 345,556, and in New Zealand March 16, 1928.

This invention relates to that well known class of machine, generally electrically driven, used in washing clothes in which a clothes receiving perforated bowl is mounted on a rotating spindle within an enclosed tank and is capable of having its axis changed from vertical to horizontal so that it may be rotated by the driving gear in either position. In the horizontal position of the axis, the bowl is designed to dip into washing, rinsing or blueing fluid placed within the tank in order that the fluid may penetrate the bowl and thereby wash, and (or) blue the clothes therein, through the rotation of the bowl. In the vertical position of the spindle the bowl is designed to be raised clear of the fluid level so that by the rapid spinning of the bowl, the clothes therein may be dried on the hydro-extractor principle.

In the present invention the construction is such as to provide for the tank, and the bowl within it, being tipped together so that the bowl and its spindle always remain relatively to the tank in the same position and the fluid, when the tank is vertical, is below the level of the bowl and, when horizontal, lies within the, then, bottom portion of the tank so that the bowl dips into it in the required manner. In this invention also the means for driving the bowl when in either of its positions, are much simplified, so that altogether a machine is provided that is simpler and cheaper and more readily operated.

The construction also embodies means for lowering the tank from the vertical to the horizontal positions, and for raising it again, and other appliances for generally facilitating the operations of the device.

In fully describing the invention reference will be made to the accompanying drawings, in which:—

Figure 1 is a side elevation of the machine, the tank and bowl being shown in the raised position and partly broken away to show the bowl within it.

Figure 2 is a plan of the under-framing and operating gear for the machine, the motor and driving connection therefor being omitted.

Figure 3 is a small detail of the holding

device for the tank that will be hereinafter more fully referred to.

Figure 4 is a rear end elevation of the machine in the raised position.

Figure 5 is a sectional side elevation of the underframing with the tank and bowl (shown in elevation) tilted out of vertical position.

In its general features of construction as to materials, fittings and so on, the machine follows along the established lines exemplified in the construction of appliances of similar nature now well known in the art.

10 is the tank which in this invention is mounted on an underframing or carriage 11 by being hinged at 12 to one edge thereof, so that the tank may be turned up to extend in a vertical axis, as in Figures 1 and 4, or may be swung over to a position inclined to the horizontal, as in Figure 5. The tank 10 which is of cylindrical form is provided with a cover over its top, one part 13 of which is hinged at 13a to provide for access thereto, while the other part 14 is fixed. This part is the lower part when the tank is turned over, as in Figure 5, and serves to retain within the tank the water with which it is charged.

15 is the rotating bowl fitted in the tank 10. This also has a door covered top 16 to provide for its charging and discharging in the well known way. The bowl is made of perforated material in the well known way and is mounted on a central spindle 17 which passes down through a bearing 18 in the tank bottom and is journaled therein to permit of its free rotation. To the lower end of the spindle, a driving wheel 19 is fixed such wheel having a plain lower surface.

Journaled in the frame 11 is a horizontal shaft 20 that is preferably mounted at its ends in bearings 21 and 22 one of which, 21, may be spring cushioned as suggested in dotted lines at 21a in Fig. 5 to support the shaft so that it may be forced downwardly against the spring pressure. On this shaft 20, a friction wheel 23 is fixed, the periphery of which is designed to engage the surface of the driving wheel 19, on one side of its centre, when the tank 10 is in the vertical position and thus act to rotate such wheel and the bowl, when the shaft is

driven. Such drive is imparted to the shaft 20 by driving connection 24—25 with an electric motor 26 arranged within the bottom of the frame 11.

The shaft 20, through reduction gearing 27, also actuates a short countershaft 28 that is journaled in one end of the frame 11, and on this countershaft 28 a mitre friction wheel 29 is fixed. These are so positioned that when the tank 10 is turned over on to its side, the wheel 29 will engage the mitred peripheral edge of the driving wheel 19 with a driving engagement as shown in Figure 5, and thus cause the bowl 15 to be rotated when the parts are in this position, but at a reduced rate.

Thus there is provision for the bowl 15 being driven rapidly when it is in the vertical position, and slowly when in the horizontal position. In the latter position it is used in the known way for washing and rinsing the clothes placed within it, the water being held within the tank, and in the former position, for wringing or drying them, the bowl then being above the water level, and the water being thrown out from the bowl into the tank by the centrifugal action.

The tank is held in the vertical position by means of a catch 30 upon the lever 31 pivoted to the frame 11 which engages a catch 32 upon the tank, when the lever 31 is moved laterally on its pivot. The tank is released for tipping over, by a reverse movement of the lever. A buffer 33 containing a cushioning spring 33a is fixed to the frame 11 to engage and cushion the tank at its free edge, as such tank is turned up to the vertical from the horizontal.

The said catches 30 and 32 are so made as to provide for a wedging action being effected as shown in the detail Figure 3, by means of which the tank may be forced downward against the buffer 33 to cause the wheel 19 to bear upon the periphery of the wheel 23. Consequently the driving motion, when the tank is in this position, is imparted to the bowl by moving the handle lever 31 across in one direction, and is stopped by moving it in the other direction, the buffer being designed to hold the tank up so that the wheel 19 is just free from contact with the wheel 23.

By mounting the shaft 20 in the spring cushioned bearing 21 provision is made for a certain amount of slip between the frictional surfaces of the wheels 23 and 19 when the wheel 19 is taking up its rotation from the wheel 23, thus ensuring that the inertia of the bowl will be gradually overcome and the full power rotation gradually conveyed to the bowl. Consequently no overloading of the electric motor 26 is liable to take place.

The tank 10 is fitted with an approved form of discharge valve 34 so that the water may be drained away therefrom as and when required.

The tank may have an electric heater element indicated diagrammatically at 35

placed within it for heating its water contents and may be fitted with a thermometer to record the heat of such contents. This element may be of any approved form and will be suitably protected from contact with the bowl and supplied with current by a conductor cable 35a.

The appliance may be fitted with hydraulic jacking means for use in lowering the tank from the vertical to the horizontal positions and for raising it again. These means comprise an ordinary hydraulic jack 36 affixed at an angle to the frame 11 and having its spear or plunger rod 37 extending upward and pivotally attached at 37a to the edge of the tank 10 that tips downward when the tank is turned over. This jack is controlled by a handle rod 38 which opens and closes its relief valve 36a. It is designed to be actuated to force the plunger outwards and upwards, by means of a friction disc 39 mounted on the end of a transverse spindle 40 that is carried on the bracket 41 of the framing 11, so that the surface of this disc 39 is adjacent to the peripheral edge of the main friction driving wheel 23. The said disc is adapted to be moved into or out of engagement with the wheel 23 by means of a clutch lever 42, in order that the spindle 40 may be rotated by such contact, or left free, at will.

The spindle 40 gears with a second spindle 43, also mounted on the bracket 41, by means of gearing 44. This spindle 43 has a crank disc 50 mounted thereon which has a crank pin 45. A rocking lever 46 is pivoted to the frame 11 and one end is connected to the pump 47 of the hydraulic jack. Its other end extends across the face of the disc 44 and is formed with a longitudinal slot 48 into which the crank pin 45 enters. The rotation of the disc spindle will thus impart a rocking motion to the lever 46 and thereby actuate the pump 47 in the required manner, to force the tank upward to the horizontal position. When the tank is to be lowered, the relief valve is opened.

I claim:—

1. A washing machine including a water containing tank, a clothes receiving bowl mounted to rotate within said tank, a frame horizontally pivotally supporting said tank to enable the latter to move from vertical to inclined positions, a friction driving wheel arranged externally of the tank and connected with the bowl for rotation therewith and having a flat friction surface and a peripheral friction surface lateral thereto, and separate driving members supported in the frame alternately engageable with the flat and peripheral friction surfaces of the wheel respectively when the tank is shifted from one position to the other.

2. A washing machine including a water containing tank and an upright clothes wash-

ing bowl rotatably mounted therein, a frame
pivotally supporting the tank for swinging
movement about a horizontal axis, a driving
gear supported in said frame for imparting
rotary movement to the washing bowl, a hy-
draulic jack disposed to extend vertically
beneath the tank and having its upper end
pivotally attached thereto, said jack includ-
ing a fluid pump and a clutch controlled driv-
ing connection between the driving gear and
the pump.

In testimony whereof, I affix my signature.
ROBERT STEWART LANGE.