

Dec. 6, 1938.

H. H. HARLAN

2,139,229

WASHING MACHINE

Filed July 1, 1935

2 Sheets-Sheet 1

Fig. 1.

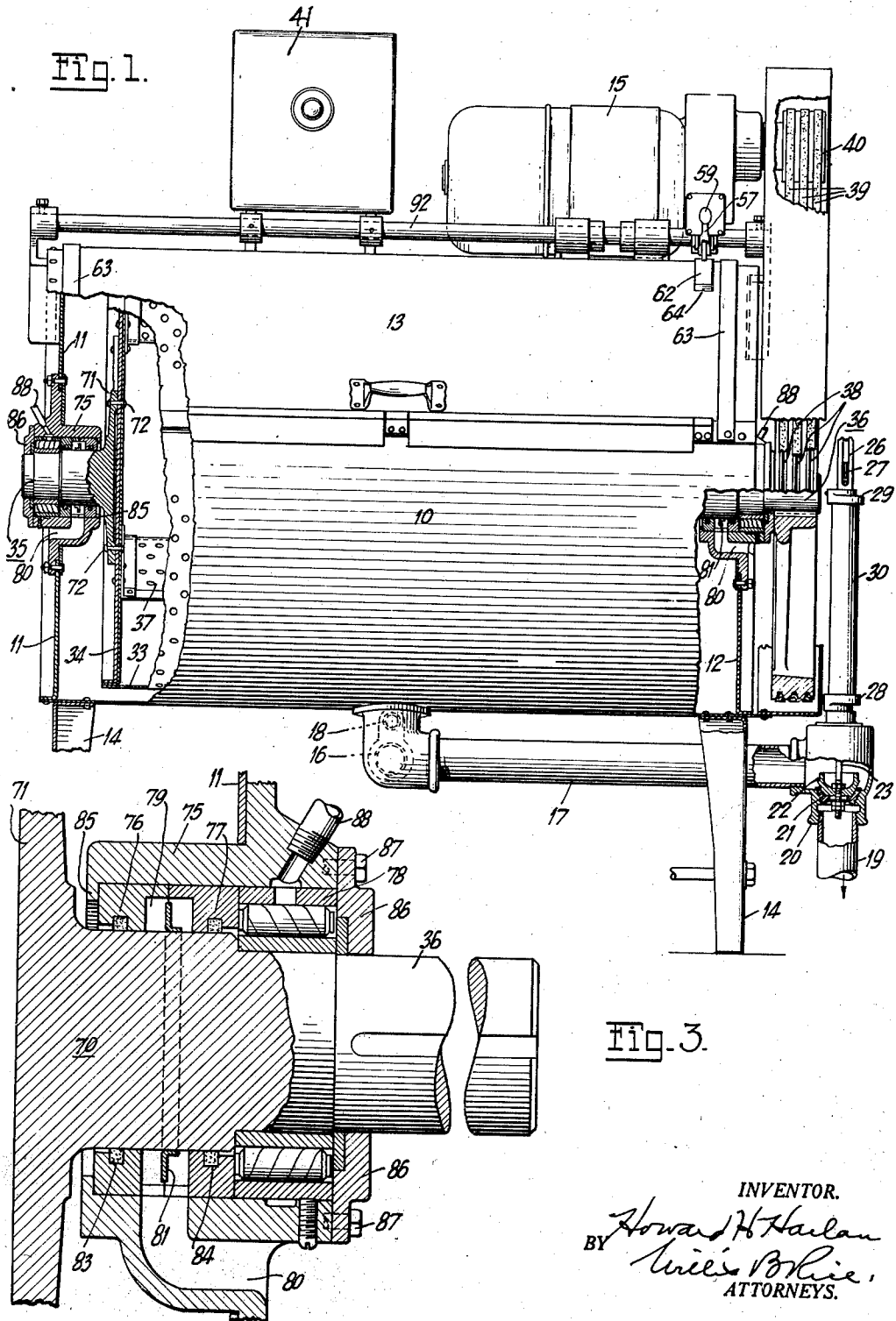


Fig. 3.

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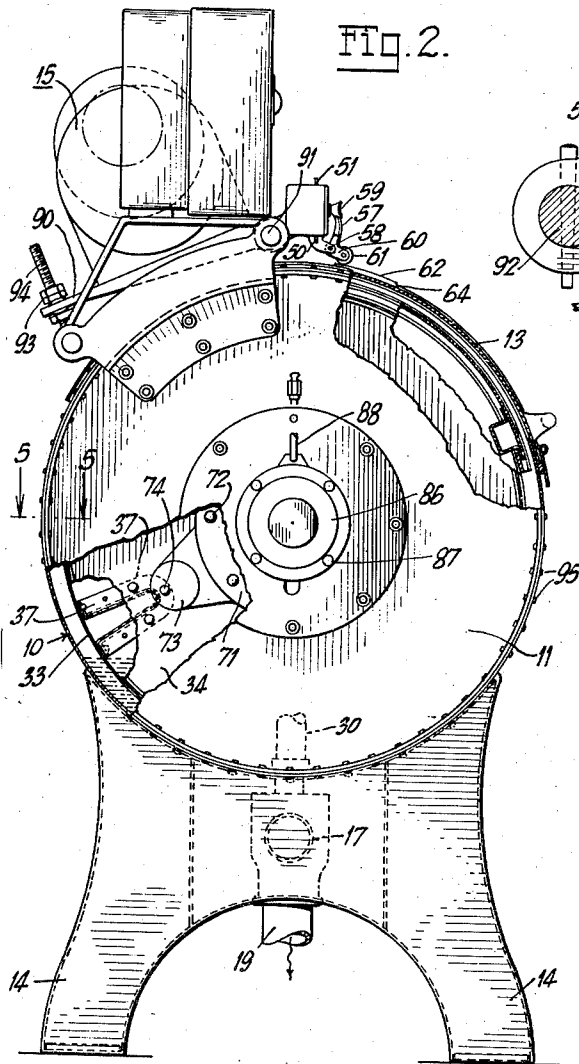


Fig. 2.

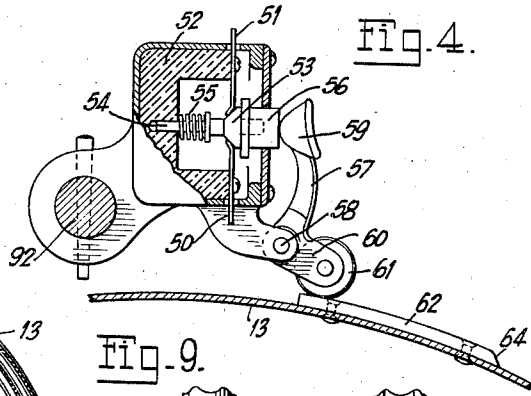


Fig. 4.

Fig. 9.

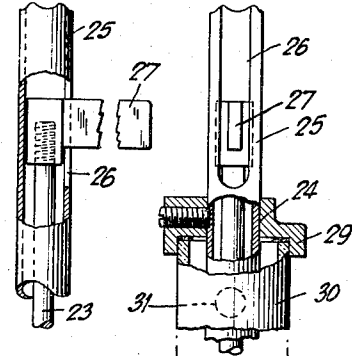


Fig. 8.

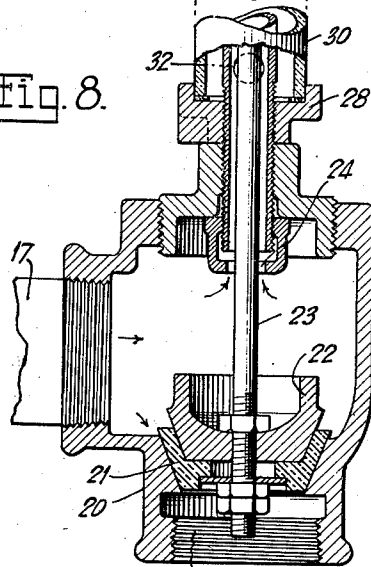


Fig. 5.

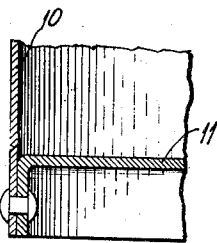


Fig. 6.

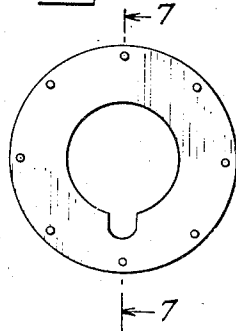


Fig. 7.



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WASHING MACHINE

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mesne assignments, to American Machine &
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Application July 1, 1935, Serial No. 29,290

1 Claim. (Cl. 137—21)

This invention relates to washing machines. It is an object of this invention to provide a new and improved machine which will be substantial in construction and yet it may be dis-assembled readily for cleaning and repairing.

It is a further object to provide a machine in which the washing solution and the lubricants for the bearings are each kept sharply confined to their own locations and without any danger of interference with each other.

It is a further object to provide a machine of the type comprising an outer horizontal cylindrical shell and an inner perforate cylinder in which the movement of the inner cylinder is controlled by the opening of the outer shell. It is a further object to provide a device of the character described which permits a partial opening of the shell for inspection or for the introduction of soap without stopping the movement of the cylinder.

It is a further object to provide a new and improved construction by which the supply and discharge of the wash water may be easily controlled and the level of the washing solution may be readily observed at all times.

Other objects will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claim.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings, in which:

Figure 1 is a front elevation of a machine embodying this invention.

Figure 2 is a side elevation thereof. In both figures parts being broken away to show details of constructions.

Figure 3 is an enlarged sectional view of the bearing construction by which the washing solution and the lubricant are confined and kept separate.

Figure 4 is an enlarged detail of the control mechanism.

Figure 5 is a fragmental section on the line 5—5 of Figure 2.

Figure 6 is a side elevation of the end plate. Figure 7 is a section along the line 7—7 of Figure 6.

Figure 8 is a front elevation, mostly in section of the drainage control mechanism.

Figure 9 is a side elevation of the upper portion of the device shown in Figure 8.

Similar reference characters refer to similar parts throughout the several views.

As illustrated in the drawings, the machine comprises primarily an outer horizontal cylindrical shell 10 having end walls 11 and 12 and closed by a sliding door 13. This shell 10 is supported upon legs 14 in any suitable manner and in turn it carries the driving motor 15 for the inner cylinder as will be later described.

This shell 10 is intended to contain the washing solution and it is provided with a water inlet 16 in its bottom and an outlet 17. Means are also provided to enable water to be heated within the shell 10 comprising as shown steam inlet 18. The admission of water and steam to the shell may be controlled by suitable valves not shown.

The discharge of the waste water from the shell is controlled by the mechanism illustrated in Figures 1 and 8. As there shown the outlet 17 is connected to a drain pipe 19 by an elbow 20, which is provided upon its interior with a valve seat 21, adapted to cooperate with a valve 22 carried by a vertical valve rod 23, sliding in a vertically extending tube 25 carrying a slot 26. This rod 23 terminates at its upper end in a handle 27, extending through the slot 26, and the handle is so arranged that with the valve in its raised position, the handle rises above the end of the tube 25 and may be rotated to rest upon the top of the tube to hold the valve in its raised position. The tube 25 carries upwardly and downwardly extending cup shaped flanges 28 and 29 adapted to carry and make a tight fit with a glass tube 30, spaced from and surrounding the tube 25. The openings 31 and 32 may be provided in the tube 25 to afford communication with the annular chamber between the two tubes, thus making it possible for the washing fluid to rise within the tube 30 to indicate the level of the solution in the shell 10.

Mounted within the shell 10 is a cylinder comprising a perforate cylindrical member 33 supported by end wall 34 and rotatable within the shell 10 upon trunnion 35 and 36. This cylinder has upon its interior U shaped longitudinal ribs 37 which reinforce the cylinder and at the same time serve as flights to lip and dump the clothing to be washed as the cylinder is rotated. One of the bearings, as for example the bearing 38, extends outwardly beyond the end wall 12 of the outer shell and carries suitable pulleys 39 adapted to receive a plurality of V belts 39 driven by pulleys 40, driven by the motor 15. Means indicated generally at 41 are provided for causing the cylinder 34 to reverse in direction after a predetermined annular movement. This motor 15 is primarily controlled by a switch which is diagrammatically illustrated in Figure 4 as comprising a pair of spring contacts 50 and 51 supported upon an insulated block 52, the spring contacts being in series with the motor 60

control circuit in a well known manner. A contact 53 is slidingly mounted with a pin 54 in insulated block 52 and is moveable from an outer position within contact with the contacts 50 and 51 by a spring 55. This contact is also provided with an outer insulated button 56, which may be depressed to a point where it connects the contacts 50 and 51 to start the motor 15. An L shaped lever 57 is pivoted at 58 upon the frame so as to have one arm 59 in position to engage the button 56. The other arm 60 carries an anti-friction wheel 61 in the path of a block 62, mounted upon the cover 13 of the shell 10. This cover 13 is arranged to slide in circumferential guides 63 and the block 62 is so arranged that when the cover is in the closed position, as shown, the block 62 engaging the anti-friction wheel 61 operates the lever 57 to hold the switch closed and the block 62 is long enough to hold the switch closed even when the cover has been raised a predetermined amount to permit inspection. When the cover has been raised a greater distance, however, the anti-friction roller 61 passes off of the shoulder 64 at the front end of the block 62 permitting the contact 53 to be forced outwardly by the spring 55, thus opening the motor control circuit and applying the brake.

By this construction it will be clear that the motor is under control of the cover for the shell so that the motor is de-energized when the cover is open and energized again when the cover is closed. And yet the cover may be opened a reasonable amount to permit inspection or the introduction of soap without stopping the motor. The bearings 35 and 36 are particularly designed to prevent the soap solution from creeping outwardly from the shell and to prevent the lubricating materials from creeping inwardly. This construction is more clearly shown in Figure 3 in which the numeral 70 comprises a stud shaft or trunnion having at one end an attaching plate 71 which may be riveted as at 72, to the end wall 34 of the inner cylinder. In order to increase the rigidity of construction and thereby make it possible to reduce the weight to a minimum, each of the plates 72 is provided with an ear 73, extending outwardly to a point where it may receive one of the rivets 74 by which the rib 37 is held, thus giving a direct reinforcing connection between the bearings and the longitudinal ribs thus forming a rigid frame work independent of the cylinder.

The end plate 11 of the shell carries a bearing housing 75 adapted to contain packing bearings 76 and 77 and roller bearing 78m. The packing bearings 76 and 77 are designed to prevent the passage of the washing solution and of the lubricant respectively and they are spaced from each other to form a chamber 79 which is in general circumferentially disposed about the shaft, and is arranged to communicate with outlet chamber 80 to permit any liquids that may enter it to drain from it. Within the chamber 79 and attached to the shaft is a flange 81 serving to furnish a separation between any lubricant that may enter the chamber 79 from the roller bearing and any washing solution which may enter it from within the shell. Any or either of these fluids which reaches the flange is carried outwardly and there discharged through the discharge opening 80. Each of the packing bearings 76 and 77 has a recess 83 and 84 to contain packing or sealing material to limit the passage of the fluids. The com-

pound bearing heretofore described is held in place within the housing 75 by being confined between a shoulder 85 on the interior of the housing and a separable flange 86 attached to the exterior by bolts 87. A suitable opening 88 may be provided, if desired, for the admission of a lubricant. If desired, the motor 15 may be mounted upon a support 90 pivoted at 91 upon a shaft 92 and supported at its other ends by lock nuts 93, upon a stud screw 94. In this manner the motor may be raised or lowered by adjustment of the nuts to vary the tension of the belts.

A device of the construction heretofore described is so simple that there is little to get out of order or to require repair, except in the case of accident, nevertheless it is desirable to provide a simple and practical means for disassembling the device easily. To achieve this result, the end wall 11 of the outer shell carrying the bearing and bearing housing upon that end is attached to the outer wall 10 (see Figure 5), in a new and improved manner which can be readily disassembled. To achieve this end, the legs 14 are inset somewhat from the ends of the cylinder, as shown in Figure 1, and the end wall 11 is bolted or riveted to the cylinder by a plurality of bolts or rivets 95 of a substance materially softer than that of which the cylinder itself is composed, which may readily be removed or cut without damage to the cylinder when it is desired to remove the end plate. With this construction, the entire device may be taken apart merely by removing the drive pulley from one end of the shaft, removing the bolts or cutting the soft rivets 95, and removing the end plate 11, together with the end bearing 35, and thereafter taking out the perforate cylinder. When repairs have been made and it is desired to reassemble the machine, the operation may be reversed and bolts or rivets reintroduced.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claim is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What I claim and desire to secure by Letters Patent is:

A washing machine comprising in combination a cylindrical shell member adapted to contain a washing solution, a substantially horizontal discharge pipe extending from said shell, a vertical pipe connected to, and at all times open for liquid communication with, said horizontal pipe, a valve mechanism adjacent the lower end of said pipe, said valve mechanism including a valve rod extending upwardly through the vertical pipe for controlling said valve mechanism, a transparent member surrounding a portion of said vertical pipe and forming a water-tight joint therewith, and means affording communication between the interior of said vertical pipe and the interior of said transparent member whereby fluid is admitted from said discharge pipe to the interior of the transparent member to gauge the height of the liquid within the cylinder.

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