March 26, 1929. G. B. KELLY 1,706,405

WASHING MACHINE

Filed July 30, 1927

Fig. 1.

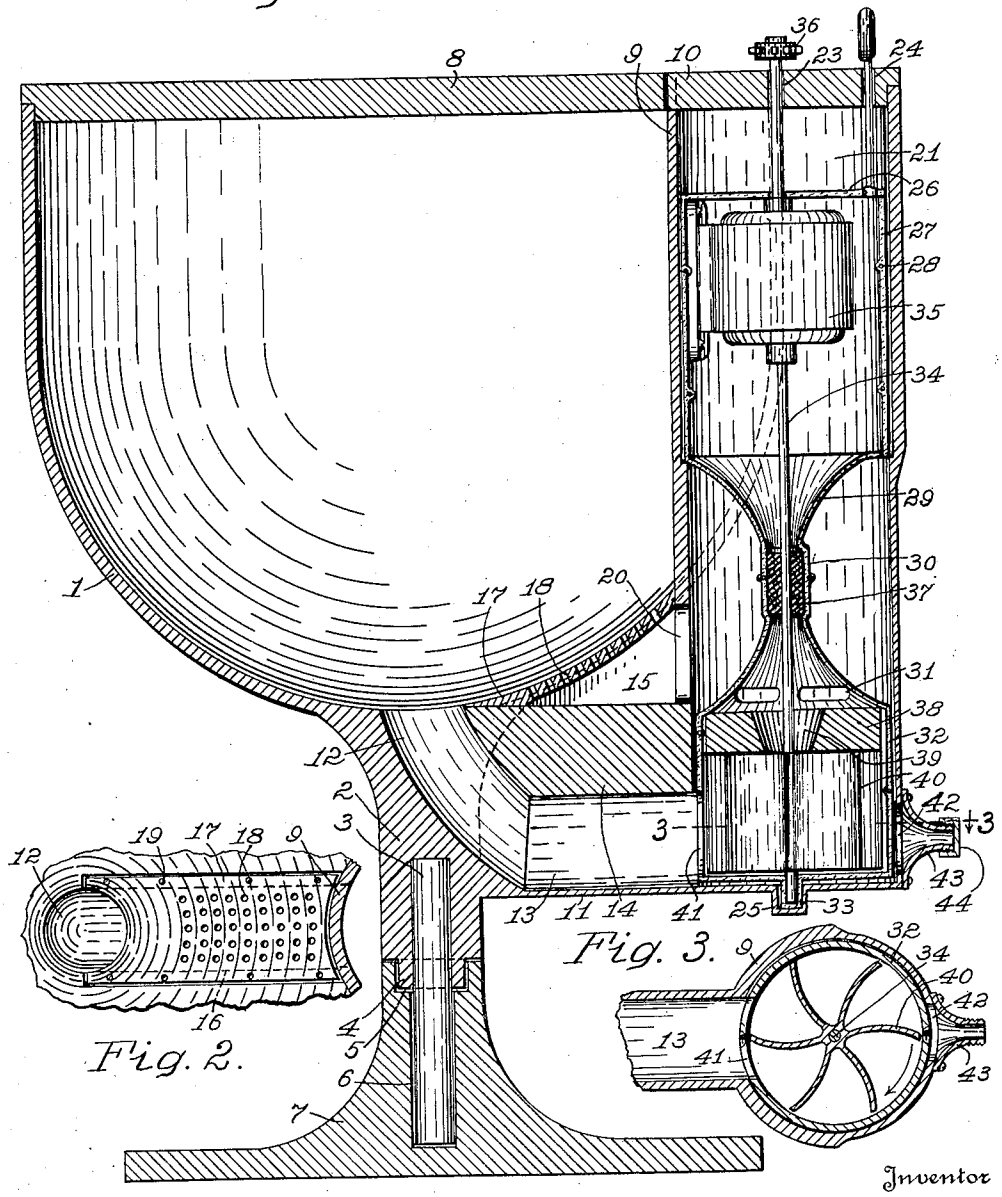


Fig. 2.

Fig. 3.

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WASHING MACHINE.

Application filed July 30, 1927. Serial No. 209,556.

My invention relates to improvements in washing machines, and the object of my improvement is to furnish a removable water circulating device for in and combination with the tub of a washing machine, and in which the tub is modified in its construction to fully cooperate therewith, in the forced lavation of clothes in the tub without injury thereto and with a maximum effectiveness and rapidity of operation.

This object I have accomplished by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which Fig. 1 is a central vertical section of a washing machine constructed according to my invention and with certain elements thereof in elevation. Fig. 2 is a fragmental top plan of the bottom part of the tub, showing the detachable apertured segment thereof for discharging the liquid contents of the tub. Fig. 3 is a horizontal section of the motor and propeller casing of the machine taken on the broken line 3—3 of said Fig. 1 looking downwardly.

My invention is not restricted to the precise construction and arrangement of parts herein shown and described, nor to the various details thereof, as the same may be modified or rearranged in various particulars without departing from the spirit and scope of my invention, one practical embodiment of which has been herein illustrated and described without attempting to show all of the various forms and modifications in which my invention might be embodied.

Referring first to said Fig. 1, the numeral 1 denotes a cup-shaped tub with open top closed by a removable closure 8, said tub 1 including an integral lateral motor and propeller casing 9 to receive the inner casing 26 of vertically elongated cylindrical form with closed end heads, the upper head being centrally apertured to receive the vertical motor-shaft 34. The bottom part of the outer casing 9 has a step-bearing cup 25 in which is removably seated another bearing cup 33 in line with and stepping the lower end of said shaft 34. The open upper end of the outer casing part 9 may be closed by a removable closure member 10 apertured at 23 to receive therethrough the upper part of the rotary shaft 34, a pinion 36 being mounted thereon for use as a driving element in the gearing combination of a wringer not shown.

The outer cylindrical casing 9 has in its outer wall at the lower end thereof an outlet-port 42 covered by a diminished nipple 43 terminally exteriorly threaded to receive a threaded cap 44, and the latter may be removed for substitution of a hose coupling not shown, when it is desired to evacuate the liquid contents of the tub 1 after washing clothes. This port 42 and nipple 43 may preferably be positioned circumferentially nearer a port 41 of the casing 9 opposite, but is shown opposite the port 41 for clearness of illustration merely.

On the same side of the casing 9 as the lower port 41 and vertically above the latter is an inlet-port 20 which is separated from the port 41 by an interposed block 14 seated in a horizontal medial hollow 15 of the tub base with parallel side walls. This block is removable merely as an expedient in the casting of the tub in a single piece, the block being separately cast and then mounted in the lower part of said hollow 15 to fit and close the latter. Said hollow 15 opens at the top into the interior of the tub 1 and has its parallel longitudinal upper angles rabbeted to provide shelves 16 to receive mating rabbeted side angles of a curvate plate 17 secured by screws 19 and being a flush portion of the inner surface of the tub. This plate 17 has numerous evenly distributed small discharge holes 18 in communication between the interior of the tub and said hollow 15 and the port 20 of said casing part 9. In the bottom part of the tub body 11 is formed a radial horizontal passage 13 in communication with the port 41 of the inner casing 26 and casing 9. At its inner end the passage 13 is continued curvingly upwardly at 12 to open upwardly centrally into the bottom of the tub 1.

The tub 1 may have an integral depending and diminished central stem 2 with a diminished end boss 4, the boss fitting into a cylindrical hollow 5 central in the top part of a widened base body 7. A solid shaft 3 is fixed in a central seat in the stem 2 to depend into a cylindrical bearing hollow 6 in the base 7, so that the tub 1 may be rotated on the base. The shaft 3 may, if desired, be fixed in the hollow 6 and loose in the central hollow of the stem 2.

The inner casing 26 has an upper cylindrical compartment in which is mounted an electric motor 35 which drives the rotary shaft 34, the shaft depending centrally through a diminished part of the casing with

a medial slightly widened part 30 which serves including its packing 37 as a stuffing-box to prevent passage upwardly into the motor compartment of water from the lower cylindrical compartment 32 of the device. The lower portion of the said diminished casing part has there around a number of inlet apertures 31 in commuication with the medial interspace 21 of the casing 9 and with the port 20, the hollow 15 and the holes 18 leading from the interior of the tub 1.

Within the lower casing part 32 and occupying its upper end an annular body 38 is centrally positioned spaced about the shaft 34 to provide an annular conical port 39 therethrough, and this body 38 is fixed upon a sleeve mounted fixedly upon the shaft 34 and depending to the bottom of the compartment 32 and carrying a number of propeller vanes 40 which are cylindrically concaved vertically in the direction of rotation as indicated by the arrow. The inner casing 26 is preferably constructed with like fitted longitudinal halves, the approximated edges preferably having a sealing gasket 27 between them, and the edges of these halves may be fastened together by any suitable means, such as pins inserted in registering holes 28 inserted from outside grooves. The annular body 38 serves as a fly-wheel upon said shaft 34.

The motor 35 rotates the shaft 34 with its fly-wheel 38 and concave vanes 40. Suction induced by the rapidly rotating vanes in the compartment 32 causes an indraft of water from the tub 1 into the compartment 32 by way of the small holes 18, hollow 15, port 20, apertures 31, fly-wheel hollow 39, and the vanes propel the water out of the inner casing compartment 32 by way of the port 41, and passage 13—12 centrally upward like a jet through the tub 1 and to penetrate the textiles in the tub, opening out their folds, and in the eddying currents set up in and because of the cuping of the tub, the articles are carried around frictionally contacting with each other and the tub wall, until cleansed. This forced circulation of liquid is maintained a suitable length of time, and then the liquid may be evacuated from the machine, by coupling a hose to the threaded nipple 43, and then by means of a handled stem 24 fixed on the top of the casing 26 eccentrically, said stem traversing an arcuate slot in the cover part 10, partially rotating the casing 26 to bring its port 41 into communication with the port 42. The still rotating vanes 40 then drive the liquid in the tub by way of said nipple, the passage 13—12 being closed except for a slight interspace allowing complete issuance of the liquid in the said passage 13—12.

When the cover part 10 is removed, the inner casing 26 may be lifted out from the outer casing 9, to permit cleansing of the machine or the mechanisms in the casing 26, or for their repair. The tub 1 affords complete clearance, and a maximum filling capacity, and has no protuberances likely to injure the lightest fabrics.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. In a washing machine, in combination, a tub, a conduit external thereto and in communication at opposite parts thereof therewith, a pumping device mounted removably and rockingly in said conduit and adapted to create a circulation of liquid through both the tub and conduit, said machine having a discharge port, and said pumping device when rocked in said conduit being adapted to close the entrance opening of the conduit into said tub while operating to discharge the tub liquid by way of said discharge port.

2. A washing machine, comprising in combination, a conjoined open top tub and lateral chamber which have vertically separted communicating passages of which the lower passage discharges liquid centrally upwardly into the bottom of the tub, a hollow casing mounted rockingly and removably within said lateral chamber, a rotary pumping device mounted in said casing, said casing having an aperture above the pumping device to effect communication between the upper passage and said pumping device and having another aperture to receive the liquid from the pumping device and convey it to said lower passage, said lateral chamber having a discharge port at its lower part spaced circumferentially from the lower aperture in said casing, whereby when the casing is rocked to close the lower passage the lower aperture in the casing communicates with said discharge port to permit evacuation of liquid in the tub by way of the discharge port.

3. A washing machine, comprising in combination, a conjoined open top tub and lateral chamber which have vertically separated communicating passages of which the lower passage discharges liquid upwardly into the bottom of the tub, a closed end hollow casing assembled from like halves connected together at their meeting edges, the middle part of the casing being constricted and containing a centrally apertured stuffing-box, said casing being fitted rockingly and removably in said lateral chamber, a motor in the upper compartment of said casing having a rotatable shaft traversing said stuffing-box dependingly into the lower compartment of the casing, curvate liquid propeller vanes mounted on said shaft in the said lower compartment and an apertured fly-wheel also mounted fixedly on said shaft in the lower compartment, said casing having apertures in its constricted portion above and communicating with the lower casing compartment by way of the aperture in said fly-wheel, said apertures also communicating with the outer end of said upper passage, said casing having a

discharge aperture in its lower compartment for communication with the outer end of said lower passage, and a discharge port located in the wall of said lateral chamber for occasional communication with the lower aperture in said casing when the casing is rocked to close the outer end of the lower passage into the tub.

4. In a washing machine, in combination, an open top tub having a cup-shaped inner wall with an inlet passage opening centrally thereinto, said tub having a lateral discharge passage above the level of said inlet opening, a numerously apertured covering plate for the said discharge passage with flush surface relative to the inner wall of the tub, means for withdrawing liquid contents of the tub from said discharge passage and returning it into the tub through said inlet passage, said means including an element for closing the inlet passage when the means if shifted in position in relation to the same, and said machine having a discharge port positioned to receive and discharge liquid from the tub when said means is thus shifted in position and is in operation for withdrawing the liquid from the tub by way of its said discharge passage.

In testimony whereof I affix my signature.

GEORGE BURTON KELLY.