A. C. COLLINS & J. E. YOUNG.

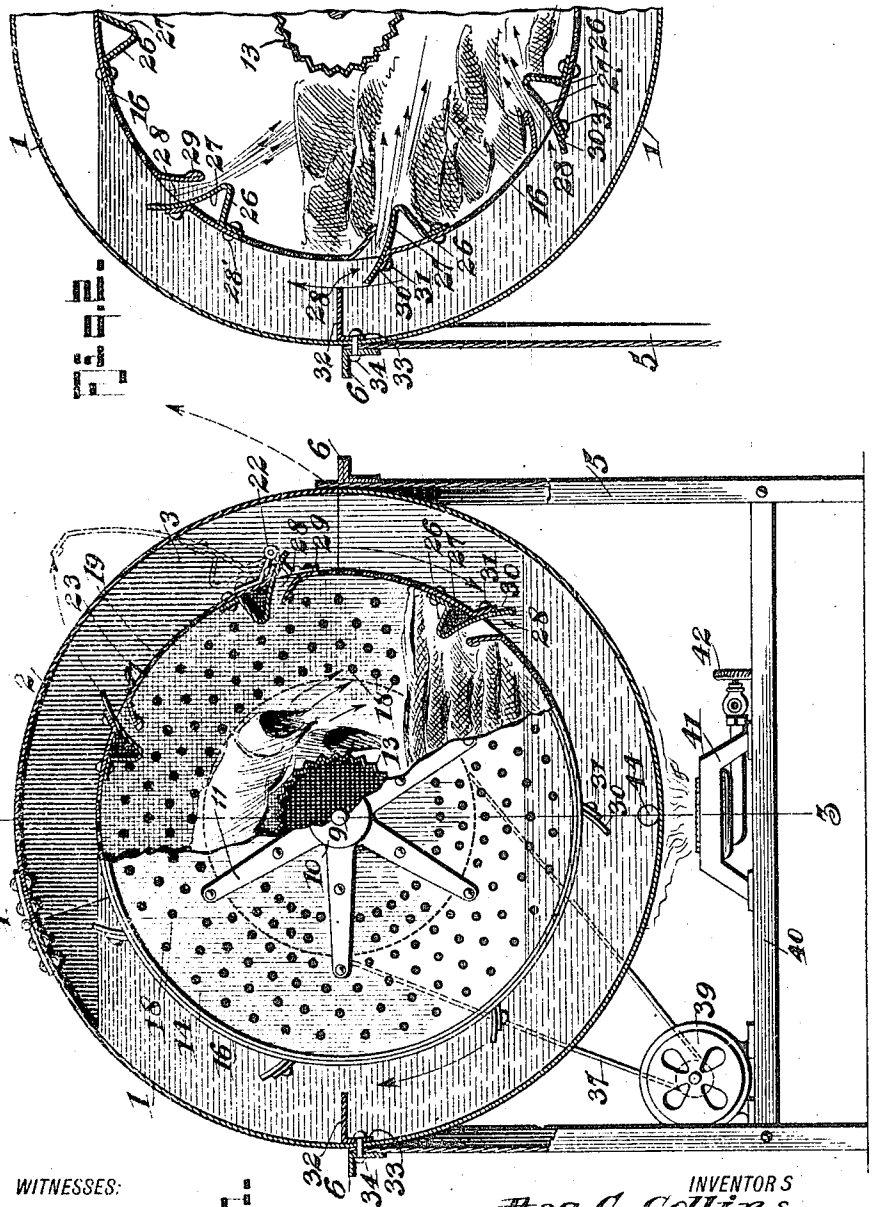
WASHING MACHINE.

APPLICATION FILED JAN. 4, 1916.

1,183,632.

Patented May 16, 1916.

2 SHEETS—SHEET 1.



WITNESSES:

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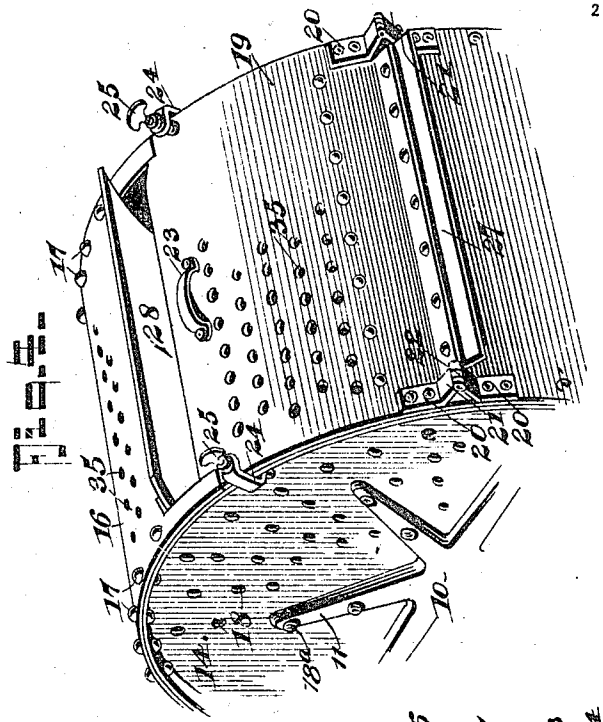
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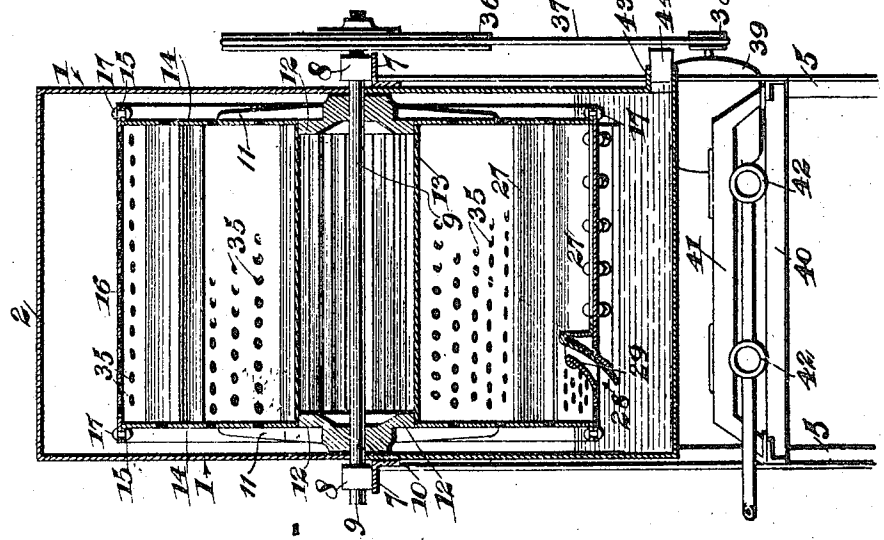
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WASHING-MACHINE.

1,183,632. Specification of Letters Patent. Patented May 16, 1916.

Application filed January 4, 1916. Serial No. 70,241.

To all whom it may concern:

Be it known that we, ASA C. COLLINS and JONATHAN E. YOUNG, citizens of the United States, and residents of Conneaut, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

Our invention is an improvement in washing machines, and the invention has for its object to provide a machine of the character specified, wherein a rotatable container of cylindrical form is provided for the clothing, which is mounted to rotate in a second container of similar form and adapted to contain a liquid charged with a detergent, and wherein mechanism is provided in connection with the first named container, for scooping up a portion of the liquid and passing it into the said first named container, and forcing it through the clothing contained in the container, during the rotation of the said first named container, and wherein heating mechanism is provided in connection with the said second named container for heating the liquid during the operation of the machine.

In the drawings: Figure 1 is a vertical section through the improved washing machine; Fig. 2 is a similar view showing the parts in a different position; Fig. 3 is a section on the line 3—3 of Fig. 1, and Fig. 4 is a perspective view of a portion of the inner container, showing the door and its mounting.

In the present embodiment of the invention, a container for the liquid is provided, the said container being in the form of a substantially cylindrical casing 1, and this casing is provided with an opening which is normally closed by a door, the said door consisting of an arch-shaped portion 2 and plain portions 3 integral therewith, and the portion 2 of the door is hinged to the casing, as indicated at 4, to permit the door to swing into open or closed position.

The length of the portion 2 of the door is somewhat greater than one-fourth of the circumference of the casing, and each of the plain portions 3 of the door is somewhat greater than one-fourth of the area of the sides of the casing. Thus when the door is open free access is permitted to the interior of the casing 1, and to the interior of the container which holds the clothing. This container or casing 1 is supported by a framework, consisting of vertical uprights or standards 5, and connecting cross bars 6 and longitudinally extending bars 7, all of the bars 6 and 7 and the uprights 5 being of angle material as shown. The container is so arranged with respect to the supporting frame, that one-half of the container is within the frame, and the other half is above the upper level of the frame, as clearly shown in Figs. 1 to 3 inclusive.

Bearings 8 are arranged on the longitudinally extending bars 7 at their centers, and a shaft 9 is journaled on the bearings. This shaft extends through the central openings in the ends of the container or casing 1, and the inner container to be later described is secured to the shaft.

Hubs 10 are secured to the shaft near each end thereof, and each of the hubs 10 is provided with radial arms 11, and with an annular rib 12 at the inner side of the arms. A cylindrical hub 13 has its ends fitting over the ribs 12 of the hubs 10, and the arms 11 of the hubs are secured to the ends 14 of the inner container. Each of these ends 14 is in the form of a disk, having a marginal outwardly extending flange 15, and the peripheral wall 16 of the inner container is secured to the ribs 15, by means of rivets 17 or the like.

The arms 11 are secured to the ends 14 of the inner container by means of rivets 18^a or the like, and the said arms are on the outer faces of the ends. The cylindrical hollow hub 13 of the inner casing is corrugated longitudinally, as shown in Figs. 1 and 2, and the disks or ends 14 of the inner container are provided with perforations 18, the said perforations being arranged as shown in Fig. 1, in annular series, the innermost series being nearer together than the openings of the other series.

The inner container or casing is provided with a door opening, which is normally closed by a door 19, which is hinged to the wall 16 of the container, in the manner shown in Fig. 4. Each hinge consists of two similar leaves, and each leaf is angular in form, consisting of a portion 20 secured to the door, or to the peripheral wall of the container, and a portion 21 extending at an obtuse angle to the portion 20.

Each of the portions 21 is provided with bearings which are adapted to aline with the bearings of the portion 21 of the adjacent leaf, and pintle pins 22 are passed through the alined bearings to hinge the door to the container. The door is provided with a handle 23 for convenience in opening and closing the same, and it is held in closed position during the operation of the washing machine, by means of the U-shaped clamps shown in Fig. 4. Each of these clamps consists of a U-shaped portion 24, and a set screw 25. Each of the U-shaped portions consists of a body radial to the container, and arms extending inwardly, one of the arms of each clamp being hinged to the adjacent disk 14, just inside the rib 15. The set screw 25 is threaded through the other arm, and the said set screw engages the outer face of the door 19, to press the same into close contact with the adjacent rib 15.

The inner container 14—16 is provided with means for scooping up the detergent liquid held in the outer casing and for forcing it through the garments held therein. Each of these scooping up mechanisms as shown particularly in Figs. 1 and 2, is a vane in the form of an angle plate, consisting of portions 26 and 27 extending at an acute angle with respect to each other. The portion 26 of each vane laps upon the inner face of the peripheral wall 16 of the inner container, and is secured to the peripheral portion by rivets 28ª. The portion 27 of each vane extends through a slot or passage in the peripheral wall of the inner casing and for some distance outside of the said peripheral wall.

At each of the passages 28 in the peripheral wall of the inner casing a pair of ribs is provided, by bending the material of the peripheral wall inwardly and outwardly formnig ribs 29 and 30, respectively. The portion 27 of each vane extends outwardly through the adjacent passage 28, lapping upon the rib 30, and being secured thereto by rivets 31 or the like, and the rib 29 at each passage is bent inwardly at a slight angle with respect to the portion 27 of the adjacent vane. The angle is such that were the rib or flange 29 extended, it would contact with the vane at the junction between the portions 26 and 27.

The free edge of each rib or flange 29 is reinforced by doubling the material of the vane back upon the body thereof, as shown in Fig. 2. These ribs or vanes are arranged obliquely with respect to radii of the container, and the long axes of the said ribs or vanes are parallel, and the vanes are spaced apart from each other at regular intervals. Each of the portions 27 of each rib or vane is arched transversely, and is arranged with its concave face adjacent to the rib or flange 29. It will be evident that when the inner container is rotated with respect to the outer container, in the direction of the arrow shown in Fig. 2, a portion of the detergent liquid will be scooped up by the portion 27 of each vane. The liquid will tend to take the position shown in Fig. 1, that is, the vanes will tend to carry the entire body of the liquid contained in the outer casing around the shaft. A portion of the detergent liquid would, however, flow through each passage 28, and because of the peculiar arrangement of the vane, the liquid would be moved with some force. Mechanism is also provided for resisting the rotary movement of the liquid, and to assist in forcing the liquid through the clothing in the inner container. The said mechanism comprises an angle plate, consisting of a horizontal portion 32 and a vertical portion 33. The vertical portion 33 is secured to the frame and to the peripheral wall of the container, by means of rivets 34, and the portion 32 of the angle plate extends radially inward into the outer container, just far enough to permit the passage of the portion 27 of the blades or vanes.

When the inner container is rotated as above mentioned, the abutment 32 will hinder the free rotary movement of the detergent liquid, and as each vane nears the abutment 32, a stream of water will be forcibly driven through the adjacent passage 28, into the inner container and through the interstices of the clothing contained in the inner container. The peripheral wall 16 of the inner container is provided with perforations 35, which are arranged at suitable intervals, to permit the passage of the liquid from the container, and to permit the free circulation of the liquid from the annular space between the two casings into the inner casing.

It will be understood from an inspection of Fig. 1, that the free edge of the door 19 of the inner casing is bent to form one of the ribs or flanges 29, and that one of the vanes 26—27 is arranged at the hinged connection of the door, the portion 27 of the said vane extending through the space between the edge of the door and the adjacent edge of the peripheral wall of the container. A pulley 36 is secured to the outer end of the shafts 9, and a belt 37 connects the pulley with a pulley 38 on the shaft of a suitable motor 39, which is arranged upon a platform or framework 40 below the outer container 1. In the present instance the motor is an electrical motor, but it is obvious that any other form of motor might be used. A heater 41 is also supported on the platform 40, the said heater being in the present instance a gas heater, and having controlling valves 42 for controlling the flow of the fuel

to the burners. The burners of the heater are directly below the outer chamber, and by means of the burners the liquid in the container may be heated during the operation of the machine.

In operation, when it is desired to use the machine, the inner cylinder is rotated to the position of Fig. 1, where the door 19 is in register with the door 2—3. The clothing to be cleansed is arranged within the inner container, in the annular space between the hub 13 and the peripheral wall 16 of the container. The outer container is partially filled with liquid, laden with a suitable detergent, and the machine is ready for operation. The inner cylinder is rotated by means of the motor, and it will be evident that as the cylinder rotates, the liquid will be scooped up by the vanes 26—27, and will be forced through the openings 28, into the inner container. This liquid will be driven forcibly through the meshes of the garments to be cleansed, and will soften and dissolve the dirt and the like that may be held in the meshes of the garments. The liquid is heated as the washing process continues, so that the clothing is boiled as it is washed. The water is driven through the passages 28 with such force that it thoroughly removes all foreign matter from the clothing without injury to the garments, since there is no handling of the garments as in rubbing. After the garments have been washed, the liquid is drained off, and a drain nipple 43 is provided for permitting the drainage, the said nipple being normally closed by a plug 44, or suitable valve. The clothes may be dried in the machine after the water has been drained off, by setting the motor to rotate at the rate of 45° R. P. M. during the drying process. The clothing may be dried as thoroughly as though they were run through a wringer, or they can be dried sufficiently to make them ready for the ironing board. It will be evident that at no time is the clothing handled by the operator. The hub 13 is for the purpose of preventing the garments from winding and knotting around the shaft so that the detergent liquid will have access to every part of the clothing. After the garments have been placed within the central container or casing, they are not handled again until they are removed thoroughly cleansed.

We claim:

1. In a washing machine, a rotary cylindrical casing, hubs at the ends of the casing formed with arms and inner ribs, the arms being secured to the outer faces of the casing ends with the ribs projecting inward from the inner faces of such ends, and a cylindrical member disposed within the casing and having its ends fitting over the ribs of the hubs.

2. A rotary cylindrical washing member having longitudinal openings in its peripheral wall, inwardly and outwardly extending ribs at opposite sides of the longitudinal openings and vanes secured to the outer ribs and projecting through the openings to a distance beyond the inner side of the peripheral wall of the rotary member and having a curved portion attached to the said wall in the rear of the outer rib.

3. A rotary cylindrical washing member having longitudinal openings in its peripheral wall, and a vane for each of the openings comprising members of unequal length having a diverged arrangement, the longer member being curved and extending through an opening of the rotary member and projecting from opposite sides thereof, and the short member being disposed within the rotary member and secured to the inner side of its peripheral wall.

4. In a washing machine, a rotary casing having longitudinal openings in its peripheral wall at regular intervals and having inner and outer ribs at the sides of the openings consisting of bent portions of the wall, the inner ribs being curved and forming one wall of passages, V-shaped vanes attached to the outer ribs, and having one portion extending through the openings and curving to form the other wall of the passages, the projecting portions of the vanes forming scoops, the remaining members of the vanes being attached to the inner side of the peripheral wall of the casing.

ASA CASSUS COLLINS.
JONATHAN ELMER YOUNG.

Signed in presence of—
RUTH DORMAN,
A. B. PITCHER.