H. M. VAUGHAN.

WASHING MACHINE.

APPLICATION FILED JAN. 5, 1917.

1,253,751. Patented Jan. 15, 1918.

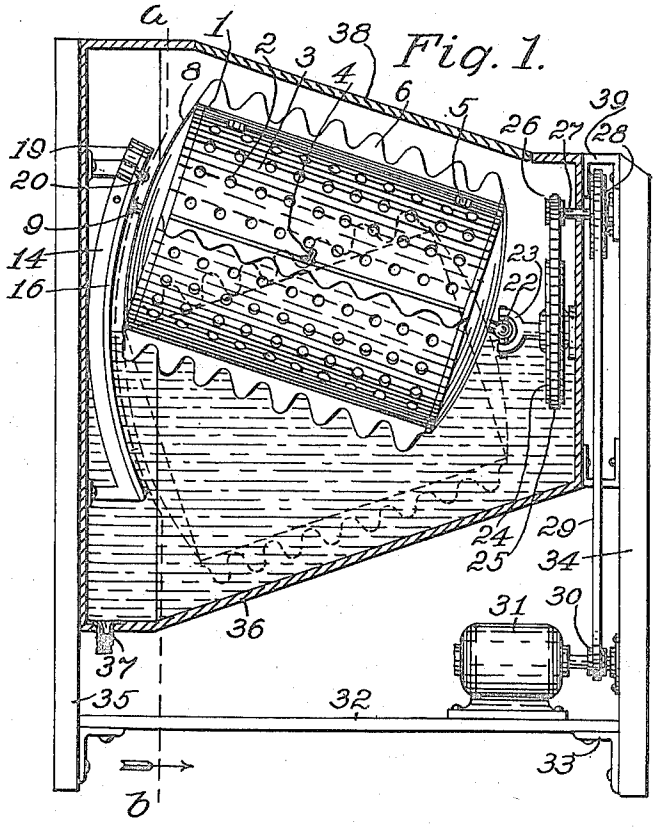


Fig. 1.

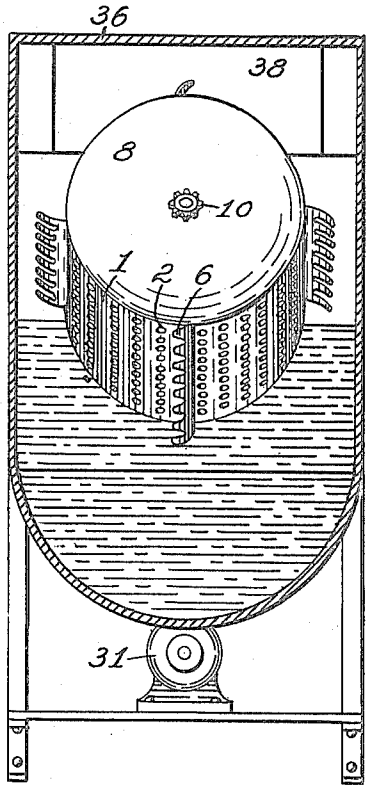


Fig. 2.

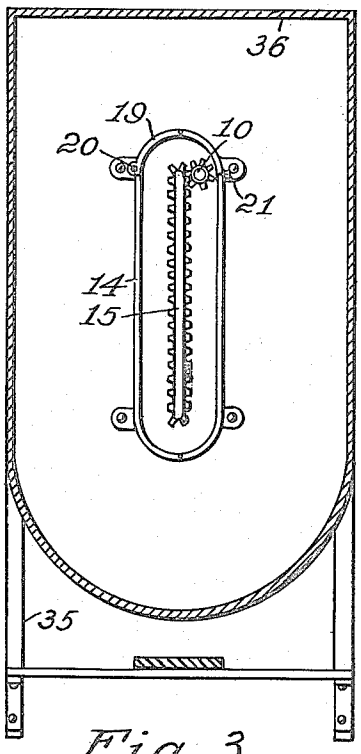


Fig. 3.

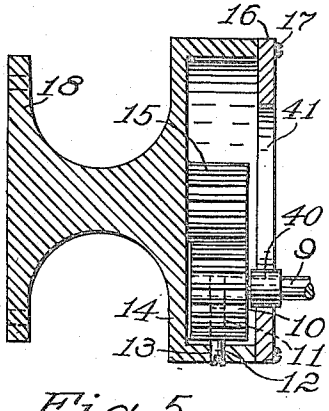


Fig. 5.

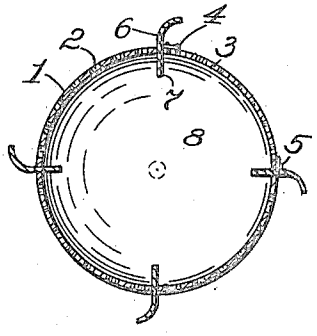


Fig. 4.

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WASHING-MACHINE.

1,253,751. Specification of Letters Patent. Patented Jan. 15, 1918.

Application filed January 5, 1917. Serial No. 140,776.

To all whom it may concern:

Be it known that I, HENRY M. VAUGHAN, a citizen of the United States of America, and a resident of Newton, Jasper county, Iowa, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

My invention relates to improvements in washing machines. One of my improvements has for an object, the provision of as oscillatory rotatable clothes container, operably inclosed in an outer relatively fixed receptacle, or independently of such an outer casing, by the operation of which, fabrics therein are subjected to a rolling motion, at the same time they are caused by gravity to slide from end to end of the container out of and into the washing liquid by reason of the raising and lowering of one end of the container out of and into the washing liquid. Another object consists in arranging means whereby the said container may be rotated without being oscillated. A third object of my improvements is to supply said container with means for agitating and mixing the washing liquid within the fixed receptacle as the tub rotates therein, to assure an even consistency thereof and to aid in disseminating the liquid through peripheral openings of the container and among its contents, to more thoroughly and quickly cleanse the latter. These objects, as are others to be hereinafter noted, are effected by the means which are described and claimed herein, and which are illustrated in the accompanying drawings, in which Figure 1 is a vertical central longitudinal section of a fixed receptacle in which is movably mounted an oscillatory rotatory container and its actuating means; Fig. 2 is a transverse section of said receptacle for the oscillatory rotatable container taken on the broken line *a*—*b* of Fig. 1; Fig. 3 is a transverse section of said receptacle taken on the same line *a*—*b* of Fig. 1, but looking in an opposite direction; Fig. 4 is a transverse section of the said container, and Fig. 5 is an enlarged cross-section of the rack-casing.

Similar numerals of reference denote corresponding parts throughout the several views.

The receptacle 36 is elongated vertically but is narrow from side to side, and is fixedly supported on front legs 35, and on brackets 39 on the rear legs or standards 34. The rear part of said casing is vertically diminished so as to have its top and bottom sloping upwardly and downwardly, respectively, toward the front, the bottom semi-cylindrical, thus affording the minimum space limits within the receptacle to properly accommodate the various movements of the container 1, and provide at the contracted lower part a receiver for dirt.

Near the front end of the bottom of said dirt receptacle is placed a stoppled opening for the discharge of the accumulated dirt and washing liquid as desired.

The container 1 is of cylindrical form with convex heads 8, but of course the form of both may be varied as desired. This container may be peripherally orificed, as by a large number of holes 2, in order to let liquid in the receptacle 36 move freely through it to lave the contents. The container 1 may have an opening, closed by a closure 3 swinging on hinges 5, and detachably secured by means of a catch 4.

In practice, the receptacle 36 will be only half-filled with liquid, so that when the container is vertically oscillated by mechanism to be described, the container will rise partially above the liquid lever or be nearly submerged therein as is indicated by the full and broken lines respectively, of Fig. 1.

Rotation is imparted to the container 1 by the following mechanism. The container has at the center of each head 8 a short axial stub-shaft 9, one shaft having a pinion 10 secured thereon by a screw or pin 12 passed through registering orifices 11 in both and also a rotatable sleeve 40. The other shaft has a bifurcation 22 forming part of a universal-coupling 23 on a short rotatable shaft extending into the receptacle 36 from a bearing box on its upright rear inner wall. A sprocket-wheel 24 is fixed on the said shaft, and a chain 25 connects it with a sprocket-wheel 26 on another rotatable shaft 27 located within the upper part of the receptacle and extending through its wall into an exterior boxing. A belt-wheel 28 on the outer part of the shaft 27 is connected by means of a belt 29 to a belt-wheel 30, the latter mounted on the drive-shaft of a motor 31 on a shelf 32 supported on brackets 33 projected from the lower parts of the standards 34 and 35. The brackets 33 may be slotted in their side arms to serve as belt-tighteners for the motor belt by adjusting the motor relatively to the

belt. The receptacle 36 has in its lower part a vent 37 supplied with a closure stopple. The gearing above described is such as to reduce the speed of rotation of the container 1 within desired limits, when driven by the electric motor 31.

To oscillate the container 1 while in rotation, I provide the following means: The numeral 18 denotes a base-casting secured to the inner front wall of the receptacle 36 and supports a bracketed vertically-elongated boxing 14 having an internal medial endless rack 15 spaced apart from its inner wall or flange, and the pinion 10 on the forward shaft 9 is located in the interspace in mesh with said rack. The upper part 19 of said boxing 14 is hinged thereto, to permit it to be swung upwardly when it is necessary to remove the fabric container 1 from the receptacle 36, the part 19 being detachably secured to the boxing 14 by a pin 20. A face-plate 16 may be fastened detachably upon the boxing 14 to hold the pinion 10 in place securely, and the sleeve 40 on the stub-shaft 9 rolls on the edge of its opening 41. When the container 1 is rotated by means of the above described mechanism, the pinion 10 moves about the rack 15, thus imparting a simultaneous up and down oscillation of the container 1. In case it is desired to have the container rotate without simultaneous oscillation, the screw 12 is removed from the pinion 10 and shaft 9, and then passed through the hole 13 in the boxing 14 and into the hole 11 in the pinion only, thus fastening the pinion in one position.

I have shown means for stirring up the water in the receptacle 36, consisting of longitudinal ribs or paddles 6 on the container 1, and which may be troughed and scalloped as illustrated, or otherwise formed as desired. These paddles can be made of one piece with parts which extend within the container 1 supplying internal longitudinal ribs 7, useful in carrying up clothes in the container while the latter is rotating. The paddles 6 cut through the water, and especially when the container 1 is in its lowermost position, stir and mix the washing liquid to make it homogeneous in consistency and prevent settlement of the soapy particles. Also, the paddles carry up quantities of the liquid to pass it through the orifices 2 in the container, which promotes circulation within the container and a better laving of the contents thereof. Since the receptacle 36 is narrow in width relative to its other dimensions to accommodate the vertical oscillation only of the container, the capacity of said receptacle is limited so as to require a minimum quantity of liquid to be supplied, while this narrowness economizes room in the laundry.

It is to be understood, however, that the form, dimensions, and various details of construction of my device may be considerably changed, without thereby departing from the principles of my invention, or the scope of its protection.

Since the container 1 has a relatively long vertical oscillation, the clothes therein have both opportunity and time to slide from end to end thereof due entirely to the action of gravity, because when the outer end of the container is at its highest position of oscillation, there are no clothes at that end, and when at its lowest position, there are no clothes at the opposite end of the container. When the swinging end of the container starts downwardly, the clothes begin immediately to loosen, and as it passes the level they begin to slide down toward this end, so that when it arrives at the downward limit of oscillation, all the clothes are gathered in this end, and on the return oscillation, a reversal of said action takes place.

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

1. In combination, a rotatable container, and means for swinging one end of said container in a loop-shaped path elongated vertically.

2. In a washing machine, a receptacle, a rotatable container positioned within said receptacle, and means for swinging one end of said container in an elongated loop-shaped path.

3. In a washing machine, a rotatable container mounted to swing from one end to and fro, and means for imparting to the free end a swinging movement in a loop-shaped path comprising an endless vertically elongated rack and a pinion on the free end of the container meshing with said rack.

4. In a washing machine, a rotatable container having a pivot on one end and mounted to swing to and fro on said pivot, an endless elongated rack, a pinion on the adjacent end of the container in mesh with said rack, said rack being curved in an arc whose center in the pivot of the container, and mechanism adapted to rotate said container to simultaneously cause said pinion to traverse said rack.

5. In a washing machine, a rotatable container mounted to swing from one end, mechanism located at the other end of said container and operatively connected therewith adapted to impart a long loop-shaped swinging motion thereto when the container is rotated, and means for rotating said container.

6. In a washing machine, a rotatable container, an endless rack, a pinion in mesh with said rack and mounted rotatably on said container, removable means for securing the pinion non-rotatably on the con-

tainer, and means for fastening said pinion to said rack when the pinion is loosely mounted upon the container by the removal of said removable securing means.

7. In a washing machine, a rotatable container mounted to swing to and fro from one end, an endless elongated rack, a pinion on the opposite end of said container in mesh with said rack, and a guard-flange about and spaced from said rack.

8. In a washing machine, a rotatable container mounted to swing to and fro from one end, an endless elongated rack, a pinion on the opposite end of said container in mesh with said rack, a guard-flange about and spaced from said rack, and a medially orificed face-plate mounted upon said guard-flange.

9. In a washing machine, a rotatable container mounted to swing to and fro from one end, an endless elongated rack, a pinion fixed on the opposite end of said container in mesh with said rack, and a guard-flange about said rack, one end part of said flange being separable therefrom.

10. In a washing machine, an oscillatory rotatable container, an endless elongated rack, a stub-shaft on the adjacent end of the container having a pinion thereon in mesh with said rack, a face-plate supported over said rack, having a central opening to permit the passage of said shaft, and an anti-friction sleeve rotatably mounted on said shaft and riding upon the edge of the opening in the face-plate.

Signed at Waterloo, Iowa, this 30th day of Dec., 1916.

HENRY M. VAUGHAN.