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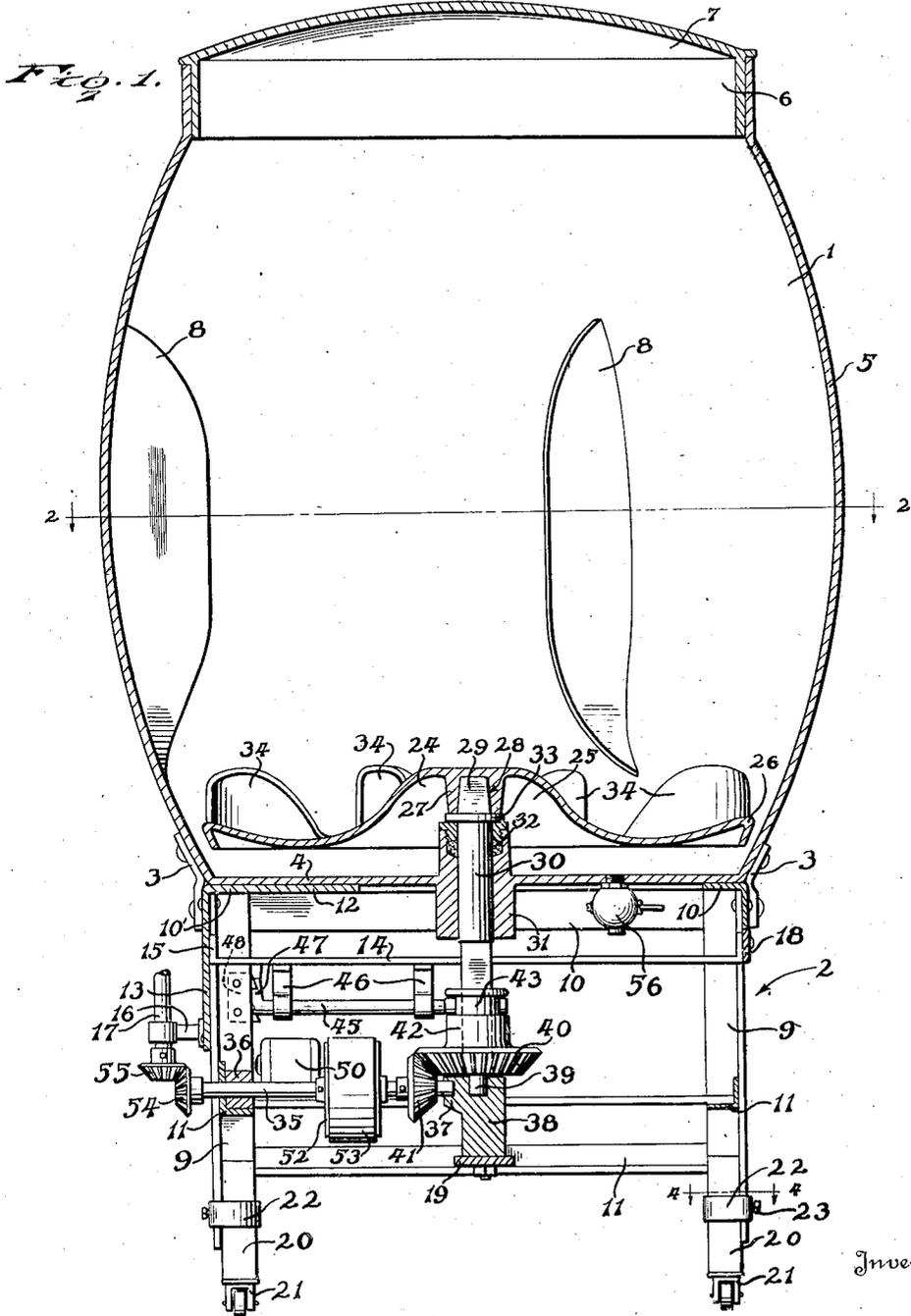
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O. A. COVERSTONE

WASHING MACHINE

Filed July 18, 1925

2 Sheets-Sheet 1



Inventor

O. A. Coverstone.

By

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Fig. 2.

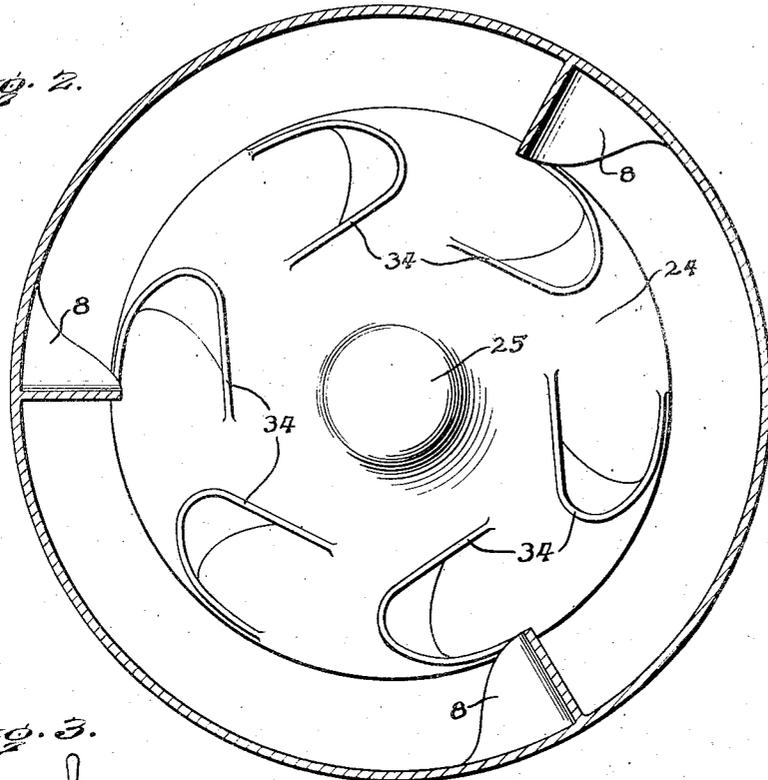


Fig. 3.

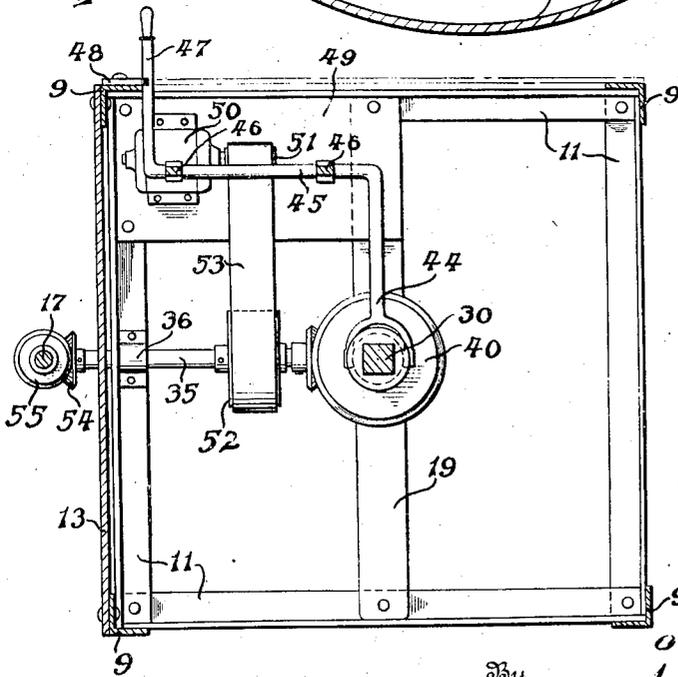
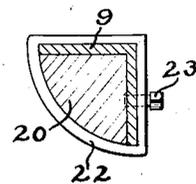


Fig. 4.



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# UNITED STATES PATENT OFFICE.

OSCAR A. COVERSTONE, OF PEMBERTON, OHIO.

## WASHING MACHINE.

Application filed July 18, 1925. Serial No. 44,548.

*To all whom it may concern:*

Be it known that I, OSCAR A. COVERSTONE, a citizen of the United States, residing at Pemberton, in the county of Shelby and State of Ohio, have invented certain new and useful Improvements in Washing Machines, of which the following is a specification.

This invention relates to a washing machine of the type in which articles to be cleaned are placed in a receptacle and water caused to circulate in the receptacle and by so doing cleanse the articles.

One object of the invention is to provide improved agitator means which are positioned in the lower portion of the receptacle and so constructed that the water will be caused to have a whirling motion in the receptacle.

Another object of the invention is to so construct the agitator means that the water when in motion will be directed towards the walls of the receptacle and impinge against blades extending radially from the walls of the receptacle so that the outer peripheral portion of the mass of whirling water will be broken up and directed inwardly.

Another object of the invention is to so form the cups carried by the agitator that the mass of whirling water will be directed upwardly as well as having a whirling motion imparted thereto.

Another object of the invention is to so form the receptacle and blades carried thereby that the agitator may be put in place or removed through the upper end of the receptacle.

Another object of the invention is to provide a washing machine in which the receptacle is supported upon a stand or frame and the agitator shaft mounted in a bearing carried by the bottom of the receptacle, the shaft extending downwardly into the frame and carrying a gear adapted to be moved into and out of mesh with a gear carried by a drive shaft which is rotatably mounted in the frame.

Another object of the invention is to so arrange the shafts that a bearing supported in the frame may serve to rotatably engage the lower end of the agitator shaft and inner end of the drive shaft.

This invention is illustrated in the accompanying drawings, wherein

Figure 1 is a vertical sectional view through the washing machine;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view taken through the supporting frame, and

Fig. 4 is a sectional view taken through one of the supporting legs on the line 4—4 of Fig. 1.

The receptacle 1 of the washing machine is mounted upon a support, indicated in general by the numeral 2, and is secured to the support by strips 3 which are riveted to the support and receptacle. The receptacle is provided with a bottom 4 and walls 5 which extend upwardly from the bottom and at their upper ends are formed into a neck 6 which receives the cover 7. The walls between the bottom 4 and neck 6 are bulged outwardly, as shown in Fig. 1, and carry blades 8 which extend radially of the receptacle, as shown in Fig. 2. The blades 8 extend longitudinally of the receptacle from a point in spaced relation to the upper end thereof to the bottom 4 and are tapered downwardly, as shown in Fig. 2, with their extreme lower end portions curved so that they extend circumferentially of the receptacle, as shown in Fig. 2. The upper ends of the blades are curved towards the walls of the receptacle so that the agitator may be easily passed downwardly between the blades to its position at the bottom of the receptacle.

The support or frame 2 which carries the receptacle 1 is formed principally of angle iron and is provided with legs 9 which are located at the corners of the frame and connected by upper and lower strips of bars 10 and 11. The angle strip 10' at one side is formed of wider material so that its upper flange 12 extends across the top of the frame to a greater extent than the upper flanges of the other strips 10 and its depending flange 13 extends downwardly along the side of the frame to a greater extent than the depending flanges of the strips 10. The flange 13 of the strip 10' has been extended downwardly the extent shown so that a cross strip 14 may have one end secured to the flange 13, as

shown at 15, and to also provide a support for a bearing 16 in which a wringer shaft 17 is rotatably mounted. The other end of the cross strip 14 is secured to a strip 18 fastened at its ends to the legs 9 at that side of the frame. It will be understood that if desired the strip 18 may be omitted and the outer flange of the angle strip 10 above it formed of sufficient depth to extend downwardly for engagement by the end of the cross strip 14. A cross strip 19 extends through the frame beneath the cross strip 14 and in transverse relation thereto and has its ends secured to the strips 11 at opposite sides of the frame. Blocks 20 are slidably engaged with the lower end portions of the legs 9 and have their lower ends provided with sockets to receive the casters 21. Clamping collars 22 fit about the legs and blocks and carry set screws 23 which when tightened will serve to securely hold the blocks in adjusted positions with their lower ends extending below the legs the necessary extent in order to support the frame at the desired height and keep it level.

The agitator 24 is formed as a disk having a diameter which will permit of its being passed downwardly through the neck 6 into the receptacle and between the blades 8 to a position at the bottom of the receptacle. Referring to Fig. 1, it will be seen that the agitator has its central portion 25 formed as a dome, the walls of which flare downwardly and merge into a dished peripheral portion carrying a depending annular flange 26. A depending hub 27 is formed at the center of the agitator and is provided with a socket 28 which opens through its lower end and is tapered upwardly. This socket is flat-sided and preferably rectangular in cross section and is adapted to receive the flat-sided tapered upper end portion 29 of the driven shaft 30. The shaft 30 which may be termed an agitator shaft is rotatably mounted in a bearing 31 carried by the bottom 4 and axially disposed with respect to the receptacle with its end portions extending above and below the bottom. At the upper end of the bearing there has been provided a stuffing box 32 which when tightened will prevent the water in the receptacle from leaking out through the bearing. A collar 33 is carried by the shaft and rests upon the upper end of the bearing 31 so that the shaft will be supported and prevented from having downward movement through the bearing. It should also be noted that the lower end of the hub 27 rests upon the collar 33 so that the agitator will be supported, as shown in Fig. 1, with the lower edge of the depending flange 26 spaced slightly above the bottom of the receptacle. Therefore, the agitator will be permitted to rotate very freely in the receptacle and impart a rapid movement to the water. In order to impart

motion to the water during rotation of the agitator, there has been provided cups 34 which are spaced circumferentially of the agitator and disposed upon the dished peripheral portion thereof. The cups are formed, as shown in Fig. 2, and referring to this figure it will be seen that each cup is U-shaped in top plan with its open side facing the direction in which the agitator is rotated. The walls of the cups taper downwardly towards their free ends and the cups are inclined in a direction opposite to the direction in which the agitator disk rotates so that, when the agitator is in motion, the cups may serve not only to impart a whirling motion to the water in the receptacle but also tend to direct the water upwardly. It should be further noted that while the cups are substantially U-shaped in top plan they are not a true U-shape but each has its outer wall portion extending substantially parallel to the periphery of the disk and are then curved inwardly with the end of its inner wall extending beyond a radius of the disk which would engage the end of the outer wall of the cup. This will cause the inner side wall portions of the blades to enter the mass of water in advance of the outer walls of the blades as the agitator rotates and, therefore, in addition to imparting a whirling motion to the water and directing the water upwardly the inner walls will also serve to direct the water towards the walls of the receptacle between the vertical blades 8 which in their turn will act upon the peripheral portion of the mass of moving water so that it will be directed towards the center of the receptacle. The water will, therefore, receive a motion which will cause it to move through the articles placed in the receptacle and cleanse the same very quickly.

In order to impart rotary movement to the agitator shaft 30 and wringer shaft 17, there has been provided a drive shaft 35 which is horizontally disposed in the frame and has its outer end portion rotatably mounted in a bearing 36 carried by one of the angle strips 11 and its inner end journaled in the side socket 37 of the bearing 38. The bearing 38 is mounted upon the cross bar 19 and in addition to rotatably supporting the inner end of the shaft 35 also serves as a thrust bearing for the lower end of the driven shaft 30. The driven shaft or agitator shaft 30 between the lower end of the bearing 31 and its reduced lower end portion 39 which rotatably fits in the socket of the bearing 38 has been formed rectangular in cross section, as shown in Fig. 3, and slidably carries a gear 40 adapted to mesh with a gear or pinion 41 which is rigidly secured upon the drive shaft 35. The gear 40 has an upwardly extending hub portion 42 adjacent the upper end of which is formed a circumferentially extending

groove or seat 43 which receives the forked rocker arm 44. The rocker arm 44 extends inwardly from a rocker shaft 45 which is rotatably mounted in bearings 46 and at its opposite end from the arm 44 is provided with an outwardly extending handle or lever extension 47. The handle or lever 47 extends outwardly beyond the side of the frame or support in position for engagement with the rack 48 so that when the handle is moved downwardly to rotate the rocker shaft and swing the arm 44 upwardly the lever or handle may be engaged with the rack and thereby retain the rocker shaft in the adjusted position with the arm 44 supporting the gear 40 out of engagement with the gear 41. It will, therefore, be seen that rotation of the driven shaft can be controlled and operation of the agitator prevented when articles to be washed are being placed in the receptacle or removed from the same. A shelf or platform 49 is mounted in the frame to support a motor 50. The motor will, of course, be mounted upon the platform with its shaft extending parallel to the drive shaft 35, the shaft of the motor carrying a pulley 51 which will be disposed opposite a pulley 52 carried by the shaft 35. A belt 53 engages the pulleys 51 and 52 and serves to transmit rotary motion from the motor to the drive shaft. Rotary motion is transmitted from the shaft 35 to the wringer shaft 17 by means of gears 54 and 55 carried by the adjacent ends of these shafts and meshing with each other.

When the washing machine is to be used, the receptacle 1 is partially filled with water in which soap or any other desired cleaning agent will be placed. The clothes or other articles to be washed are placed in the receptacle so that they are immersed in the water and the cover 7 then put in place. After the cover has been closed, the motor will be started and if the gear 42 is not in engagement with the gear 41 the lever 47 will be released from the rack 48 and moved upwardly so that the gear 42 will be moved downwardly into position for engagement with the gear 41. The shaft 30 will then be caused to rotate and as it rotates the agitator will be turned so that the blades or cups 34 will act upon the water to impart a whirling motion to the water and also direct the water upwardly and towards the walls of the receptacle. The mass of whirling water will be broken up and directed inwardly by the blades 8. The water will, therefore, be very thoroughly agitated and will be so passed through the clothes in the receptacle that the clothes will be very quickly cleaned. After the clothes have been thoroughly cleaned, the water may be drained outwardly through the outlet 56 and the receptacle then filled with clear water which will be circulated through the clothes by the

agitator and thoroughly rinse them. The rinsing water is then drained off and if desired the agitator may be permitted to rotate after the rinsing water has been drained off so that air will be circulated through the clothes and a portion of the moisture driven off. The cover is then removed and if so desired may be used as a tray to hold damp clothes removed from the receptacle prior to passing them through a wringer which is not shown but which will be mounted at a convenient place and operated from the shaft 17. When all of the clothes have been removed from the receptacle, the agitator may be withdrawn through the open upper end of the receptacle and the agitator and interior of the receptacle then thoroughly cleaned and the agitator put back in place. Having thus described the invention, I claim:

1. A washing machine comprising a vertically disposed receptacle, a horizontally disposed disk rotatably mounted in said receptacle adjacent the bottom thereof, cups extending upwardly from the peripheral portion of said disk and being U-shaped in top plane with their open sides facing circumferentially of the disk in one direction of rotation and adapted to impart a whirling motion to fluid in said receptacle when the disk is rotated, the side arms of said cups being substantially vertical and the portions of said cups connecting the side arms thereof being inclined to extend in overhanging relation to said disk and impart an upward thrust to the fluid, and means to rotate said disk.

2. A washing machine comprising a vertically disposed receptacle, a horizontally disposed disk rotatably mounted in said receptacle adjacent the bottom thereof, cups extending upwardly from the peripheral portion of said disk and adapted to impart a whirling motion to fluid in the receptacle when the disk is rotated, said cups being U-shaped in top plan with their open sides facing circumferentially of the disk in its direction of rotation and each having the free end of its inner arm extending beyond a radius of the disk intersecting the free end of its outer arm, and means to rotate said disk.

3. A washing machine comprising a vertically disposed receptacle, a horizontally disposed disk rotatably mounted in said receptacle adjacent the bottom thereof, cups extending upwardly from the peripheral portion of said disk with their upper ends flush with the plane of the top of the raised central portion of the disk, said cups being substantially U-shaped in top plan with their open sides facing circumferentially of the disk in its direction of rotation and having the upper edges of their inner and outer side arms sloping downwardly towards their free

ends, the inner arm of each cup being straight throughout the greater portion of its length and the outer arm being curved parallel to the peripheral edge of said disk for a portion of its length and then curved inwardly and merging into the rear end portion of the inner arm, the portion con-

necting said arms extending in overhanging relation to the disk and adapted to impart an upward thrust to the fluid.

In testimony whereof I affix my signature.

OSCAR A. COVERSTONE. [L. s.]