Dec. 2, 1930. O. T. DEHLE 1,783,415

WASHING MACHINE

Filed April 18, 1930 2 Sheets-Sheet 1

Fig. 1.

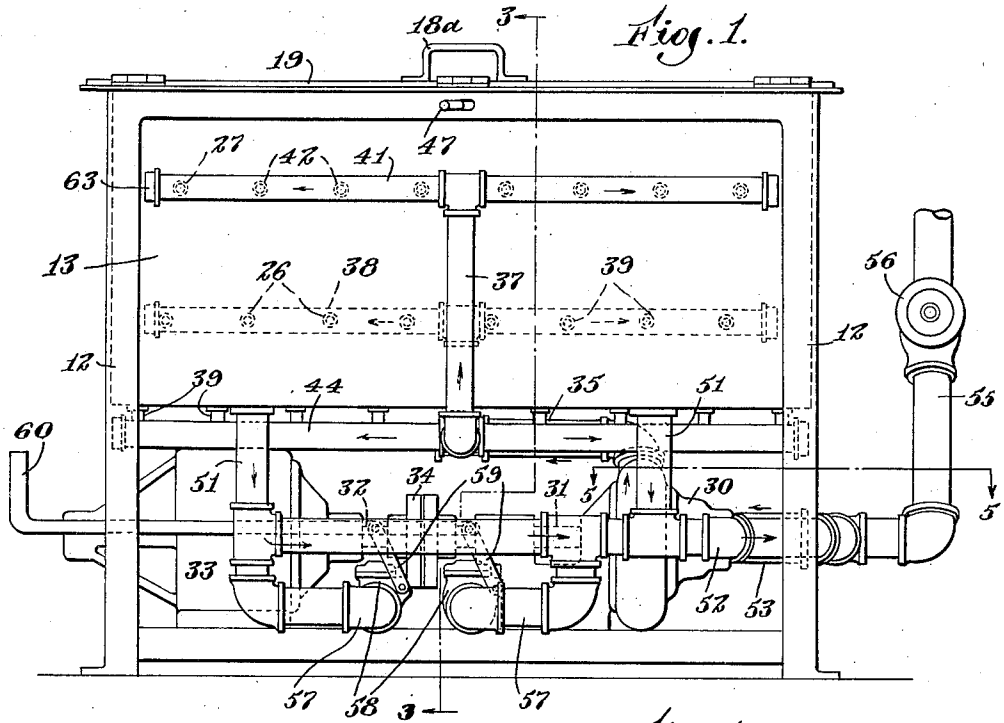

Fig. 4.

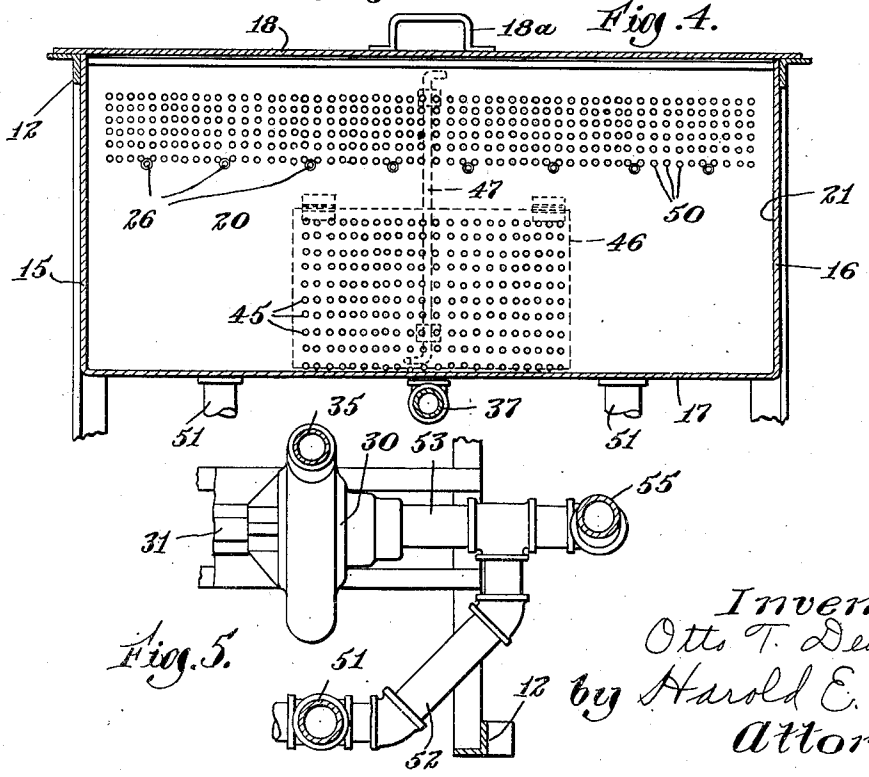

Fig. 5.

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Filed April 18, 1930 2 Sheets-Sheet 2

Fig. 3.

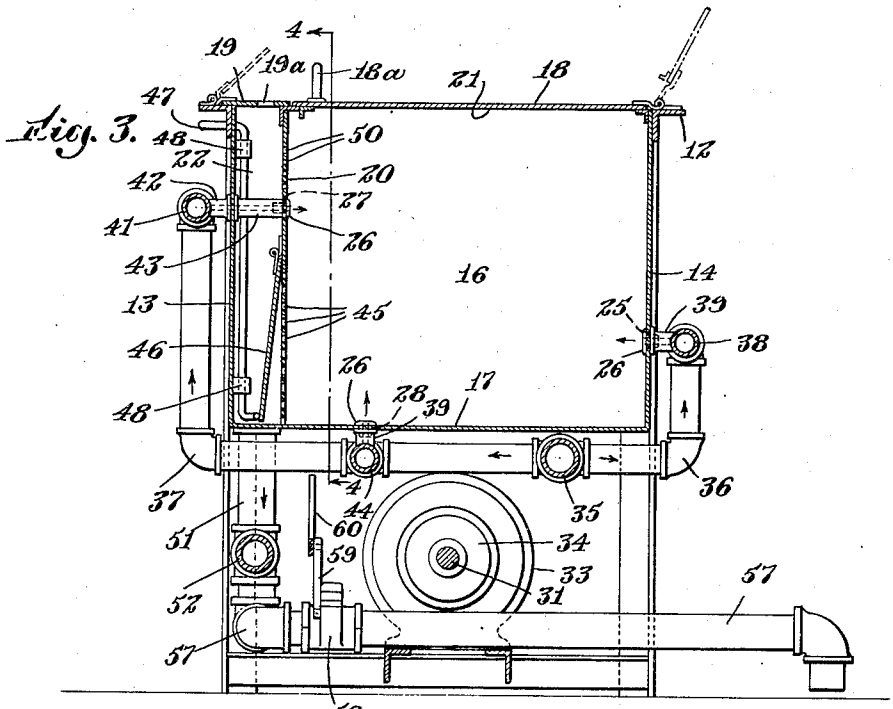


Fig. 7

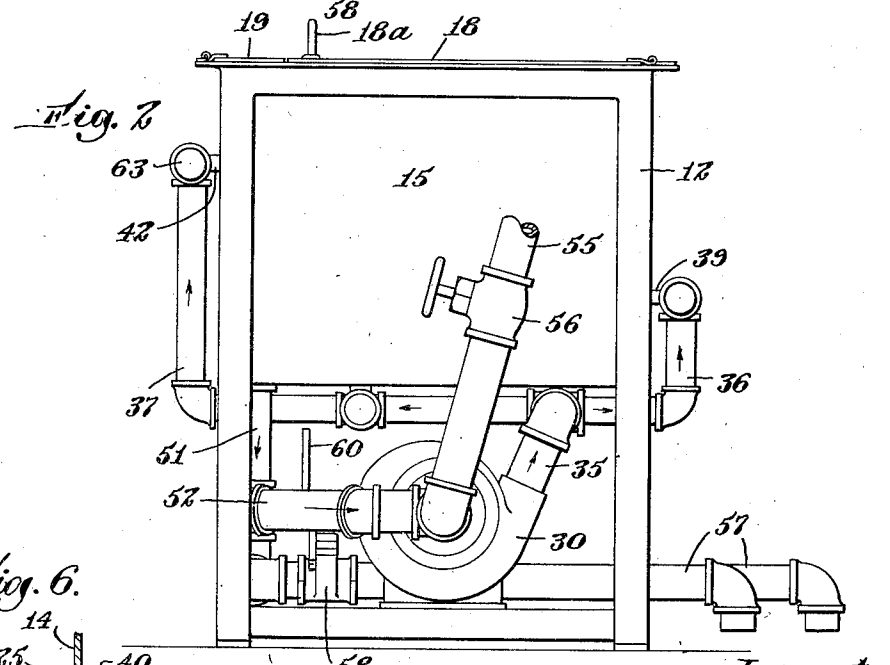
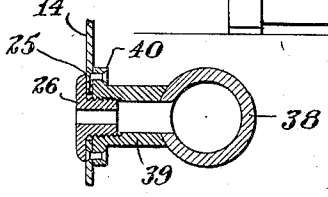


Fig. 6.



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UNITED STATES PATENT OFFICE

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WASHING MACHINE

Application filed April 18, 1930. Serial No. 445,322.

This invention relates to washing machines, and particularly to one designed to wash fabrics, such as clothes, curtains and fine goods, solely by forcing streams of a saponaceous fluid into the washing receptacle. No agitators, dashers, etc. are used and the washing receptacle need not be revolved or otherwise moved.

In accordance with the rules of practice reference is made to my co-pending applications, Serial Number 301,541, filed August 23rd, 1928, Serial Number 330,687 filed January 5th, 1929, and Serial Number 364,398, filed May 20, 1929.

The machine embodying the improvements illustrated and described in this application, while not a radical departure from the machines described in the above pending applications, nevertheless is somewhat changed, especially as to the location of the ports through which the streams enter the receptacle at one side.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and operative arrangement of parts such as is disclosed by the drawings. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to the constructions disclosed by the drawings; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawings:

Figure 1 is a front elevation of my washing machine.

Figure 2 is a right side elevation of my machine.

Figure 3 is a cross-section taken on the line 3—3 of Figure 1.

Figure 4 is a cross-section taken on the line 4—4 of Figure 3 showing particularly that side of the receptacle through which the water escapes.

Figure 5 is a plan cross-section taken on line 5—5 of Figure 1 showing conduits through which water returns to the pump.

Figure 6 is an enlarged cross-section detail showing manner in which connection is made between manifolds and nozzles through which water is introduced into the receptacle.

As illustrated my washing machine is particularly adapted for use in laundries, although it is suitable for domestic purposes if made smaller. It consists of an outer frame 12 within which is the receptacle or tank the articles or clothes are washed in. Said receptacle has a front outer side 13, a back side 14, a right side 15, a left side 16 and a bottom 17. The top 18 of the tank is hinged and has a handle 18*a* by which it may be raised. Another hinged top 19 is provided for the well later described, in which is a vent hole 19*a*. The receptacle also has an inner front side 20 which serves as a partition to provide a well 22 between it and the outer front side 13, into which well the washing liquid pours on its way back to the pump. The tank or receptacle within which the clothes are washed is given the numeral 21.

The tank 21 is provided with a number of ports to permit the introduction of water into which ports nozzles 26 are fitted. There is a series of ports 25 in the back side 14, another series 27 in the inner front side 20 and another series 28 in the bottom. The number of ports may be varied, of course, depending upon the size of the machine. It will be noted from Figure 1 of the drawings that the bottom and side ports, 28, 27 and 25 respectively are so positioned in relation to each other that none of the streams from these three series of ports are in alinement at their entering points. The object of this arrangement is to have the streams as they enter strike the clothes in as many different places as possible. The water is forced to the receptacle 21 and received from it by a pump 30 having a shaft 31 driven by a motor 33 having a shaft 32 both of which shafts 31 and 32 are connected by a coupling 34.

Water is forced from the pump 30 into the main conduit 35 thence into conduits 36 and 37. Said conduit 36 empties into manifold 38 attached to the back side 14 and the water passes from said manifold into the

receptacle 21 through said nipples 26 in said ports 25. The connection between said manifold 38 and nozzles 26 is illustrated in Figure 6 of the drawings, showing a nipple 39 preferably brazed to said manifold 38, which nipple has a flange 40 riveted to the side of the receptacle. The threaded nozzles 26 screw into threads in said nipples 39. This connection is the same for the back side 14 and bottom 17. At the front side 13 conduit 37 empties into a manifold 41 and a nipple 42 is brazed to said manifold. A length of pipe 43 is attached to said nipple 42 and a nozzle 26 is screw threaded into said pipe 43. The conduit 37 also runs into a manifold 44 attached to the bottom 17.

The inner front side 20 of the receptacle is provided with a number of perforations 45 below the ports 27 through which water escapes into the well 22 when emptying the receptacle 21. Normally a hinged plate 46 covers these perforations, which cover 46 is operated by a handle 47 supported by bearings 48 which are brazed to inner surface of front outer side 13. Said inner front side 20 is also provided with a large number of perforations 50 mostly above the ports 27 through which water is constantly escaping into the well 22 and returning to the pump while the machine is in operation. These perforations 50 are located above the course of movement taken by the clothes while being washed so that the powerful suction created by the escape of so much water will not draw any of the articles against said side 20 and thereby cover some of the perforations 50 which would result in preventing the return of water to the pump.

Return conduits 51 are connected to each end of the well 22, which conduits 51 are connected to another conduit 52 which in turn is connected to conduit 53 leading into the intake of pump 30.

Water is supplied to the washing receptacle through conduit 55 which has a valve 56, which conduit 55 connects to conduit 53 leading into the pump intake. To empty the receptacle drain conduits 57 are provided which connect with conduits 51 and 52, each of which conduits 57 has a valve 58 and each valve has a lever 59 fastened to it, both of which levers 59 are controlled by a handle 60, the pushing of which handle moves the levers 59 to thereby open the valves 58 and drain the water out of the machine and system. In Figure 1 of the drawings the valves 58 are shown in open position.

The operation of the machine is as follows:

Valve 56 is opened and water passes to the pump 30, thence through the conduits leading to the various manifolds and through the nozzles 26 into the receptacle 21. When the water reaches a level slightly above the first few rows of perforations 50 the valve is closed, as the receptacle, well and piping system are filled, and the motor is started. Water is pumped into the conduits, passes into the manifolds and through the nozzles 26 in the various ports 25, 27 and 28, entering the receptacle 21 in forceful streams. These streams drive the clothes about the receptacle in quite a regular course, bringing them in close proximity to each of the ports 25, 27 and 28 in each complete movement about the receptacle. The streams entering through the ports 28 pour through the clothes and move them upwardly until they reach a point substantially opposite the ports 27 where the streams pour through the clothes and abruptly change the direction of their movement, forcing them to the opposite side where they drop downwardly until they reach a point where the streams are entering through ports 25, which streams pour through the clothes and move them to a point close to, but above, the ports 28. This movement of the clothes about the receptacle is repeated again and again until they are clean. The streams of liquid are continually entering the receptacle, although they could be made to enter intermittently, and the liquid is continually escaping through the perforations 50 into the well 22 and through the return conduits back to the pump to be forced to the receptacle again.

It should be noted that the ports are so located with relation to each other that the streams move the clothes in a course which brings them in close proximity to the entering points of all of the streams. The real washing or cleaning is mostly accomplished near the ports where the entering streams strike the clothes at close quarters, abruptly changing their direction and turning them over. At these points the water is forcefully driven through the clothes, which loosens the dirt. To merely circulate the articles about the receptacle would not wash them clean, for they must be turned over, their direction must be changed, and the streams of liquid must be driven through them as they enter before their force is spent.

To dump the water the plate 46 is opened, the valves 59 are opened, permitting the water to escape through the conduits 57 to a drain in the floor.

It will be readily understood, that the nozzles 26 may be so constructed that the streams may enter in diagonal or other directions, instead of vertically or horizontally, as shown, in which event the positions of the ports 25, 27, and 28 cauld be changed and the same washing action obtained. This would be a more expensive construction, however, and the preferable construction is that illustrated in the drawings.

What I claim is:

1. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means

for forcing said liquid to said receptacle and receiving it again, said receptacle having a port at the bottom for the introduction of a stream upwardly, a port at one side for the introduction of a stream horizontally, and another port at the opposite side for the introduction of another stream horizontally, said ports being so located relative to each other that said articles are caused to be moved by the streams entering through said ports in a substantially regular course in said receptacle and are brought in close proximity to each of said ports during each complete movement about the receptacle, said receptacle having provision for the escape of said liquid to said means.

2. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcing said liquid to said receptacle and receiving it again, said receptacle having ports at three widely separated points for the introduction of said liquid in three different directions, one of said ports being located at the bottom spaced from the center, another port at a side nearest to said bottom port, and another port at a side opposite said first-mentioned side, the last-mentioned port being located substantially lower than the port at the first-mentioned side, said bottom port being so positioned relative to said first-mentioned side port whereby said liquid entering said receptacle through said bottom port will force said articles in close proximity to said first-mentioned side port, and said ports at said sides being so positioned relative to each other that said liquid entering said receptacle through said first-mentioned side port will cause said articles to be moved in close proximity to said second-mentioned side port, and said second-mentioned side port being so positioned relative to said bottom port that said liquid entering said receptacle through said second-mentioned side port will force said articles in close proximity to and above said bottom port, said receptacle having provision for the return of said liquid to said means.

3. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcing said liquid to said receptacle and receiving it again, said receptacle having provisions whereby streams of said liquid may enter said receptacle directed upwardly, directed horizontally from one side and directed horizontally from an opposite side, said entrance points being so positioned relative to each other that said upward stream moves said articles in close proximity to the entering point of the first-mentioned horizontal stream, which latter stream moves said articles in close proximity to the entering point of the second-mentioned horizontal stream, which stream in turn moves said articles in close proximity and above the entering point of said upward stream, whereby said articles are repeatedly driven about said receptacle in a course which brings them in close contact with all of said streams at their entering points during each complete course of movement, said receptacle having provision for the escape of said liquid to said means.

4. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcing said liquid to said receptacle and receiving it again, said receptacle having ports for the introduction of said liquid at the bottom, at one side and at another side opposite the first mentioned side, said latter mentioned port being located more than half way down the second mentioned side, said ports being so positioned relative to each other that the streams of liquid entering through said ports repeatedly force said articles upwardly adjacent the first mentioned side, then across said receptacle and downwardly adjacent the second mentioned side, and then across to a point above and adjacent said bottom port, said receptacle having provision to permit the return of said liquid to said means.

5. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcing said liquid to said receptacle and receiving it again, said receptacle having ports for the introduction of said liquid from the bottom and two sides, and being provided with perforations in one side thereof above said ports through which said liquid may escape to said means when the machine is in operation, and perforations in one side a substantial distance below said first-mentioned perforations through which said liquid may be drained from the machine, and means adapted to prevent said liquid passing through said second mentioned perforations while the machine is in operation.

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