Sept. 9, 1930. O. T. DEHLE 1,775,554

WASHING MACHINE

Filed Jan. 5, 1929 2 Sheets-Sheet 1

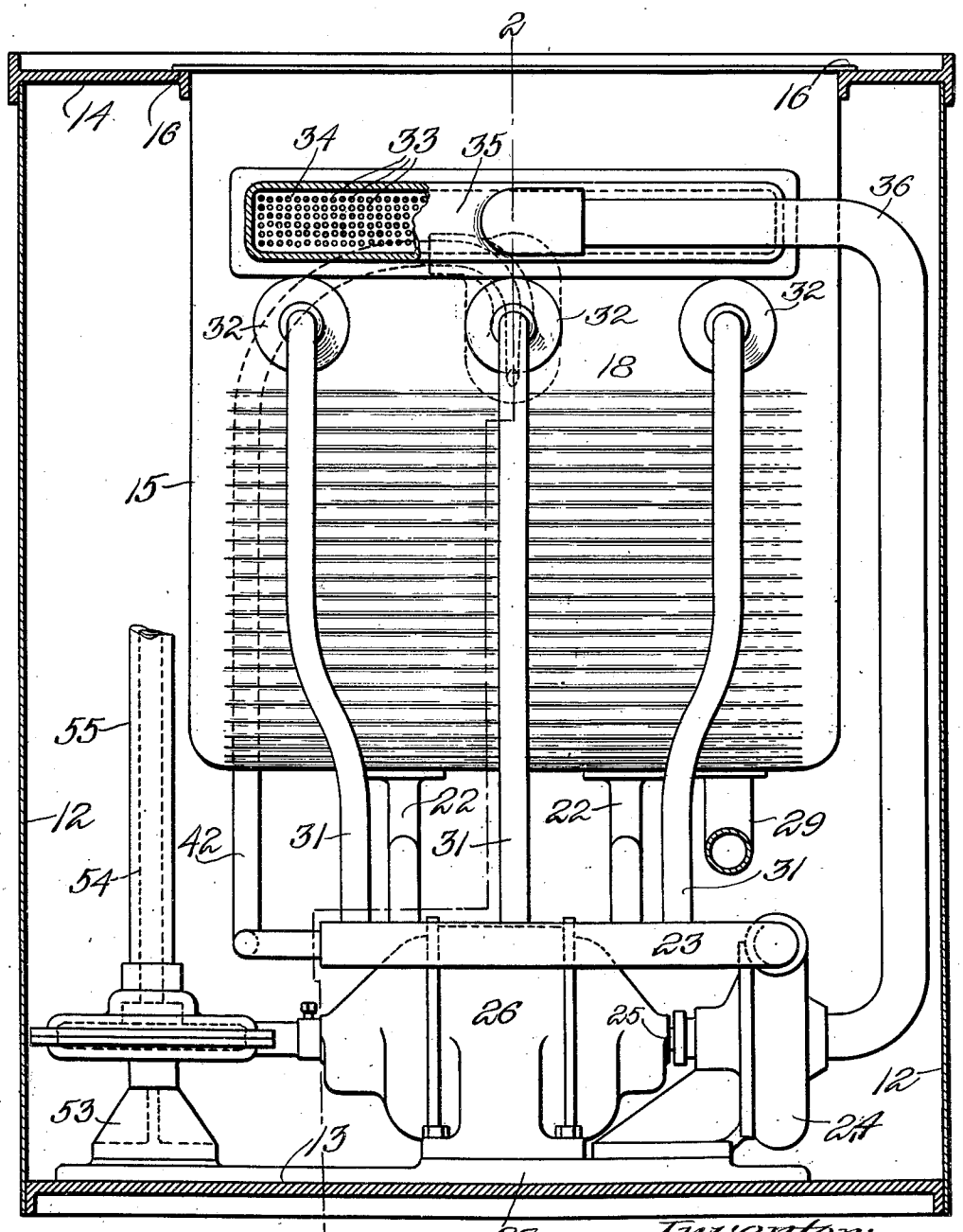

Fig. 1.

Inventor:
Otto T. Dehle
By Holton, Murray & Cole
Attys.

Sept. 9, 1930. O. T. DEHLE 1,775,554

WASHING MACHINE

Filed Jan. 5, 1929 2 Sheets-Sheet 2

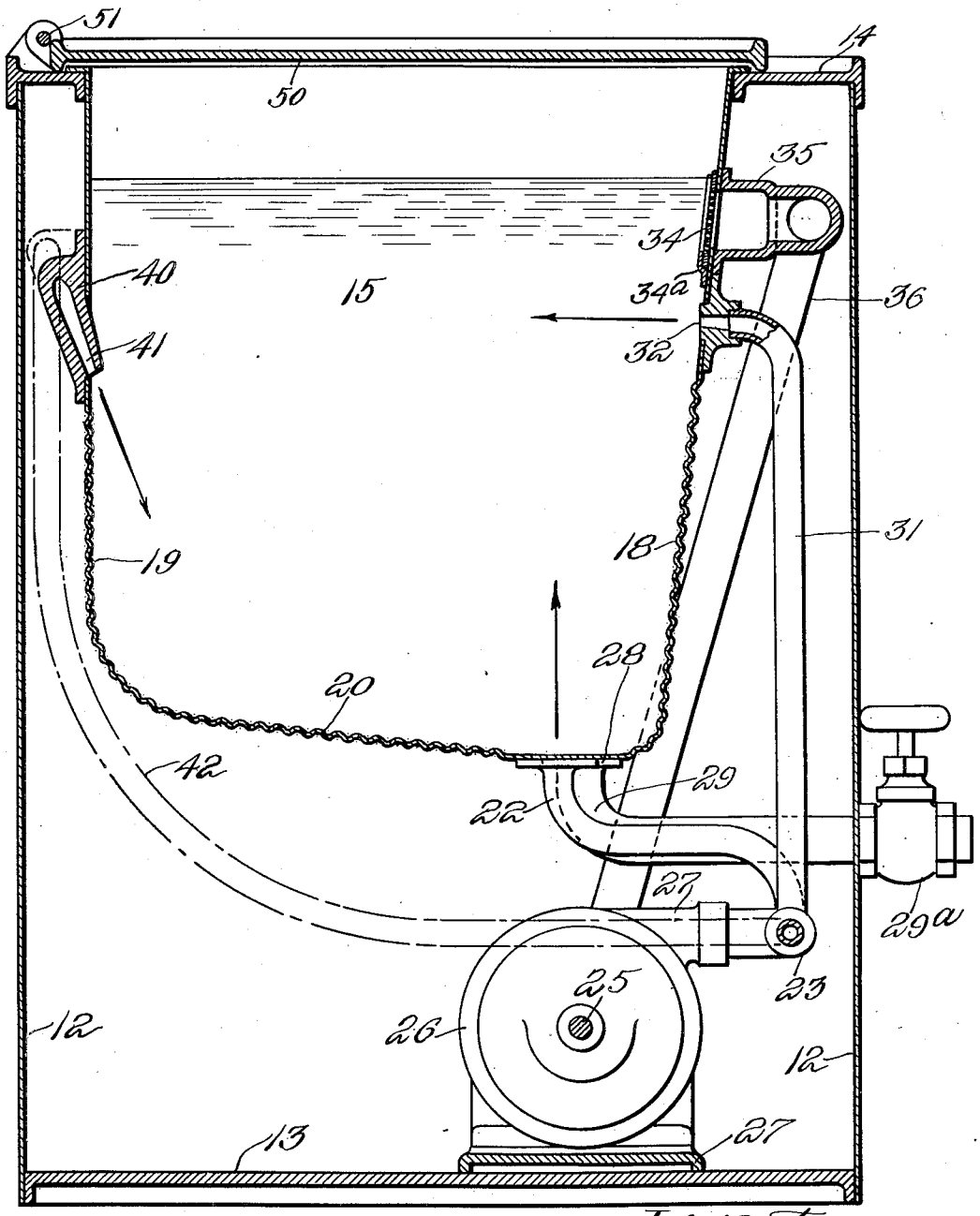

Fig. 2.

Inventor:
Otto T. Dehle
By Holton, Murray & Cole
Atty's.

Patented Sept. 9, 1930 1,775,554

UNITED STATES PATENT OFFICE

OTTO T. DEHLE, OF WATERTOWN, MASSACHUSETTS, ASSIGNOR TO MULTI-HYDRO WASHING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

WASHING MACHINE

Application filed January 5, 1929. Serial No. 330,687.

This invention relates to an improved washing machine, particularly to one that washes clothes solely by the movement of soapy water under pressure.

Such a machine to wash clothes satisfactorily must introduce the soapy water forcefully and rapidly, and preferably continuously, to the tub, at several different points, and simultaneously with the introduction of water to the tub there must be an escape of the same quantity of water from the tub back to the pump without any interference or clogging, otherwise the pump will not function and the washing operation will cease. This rapid escape of a large quantity of water causes a powerful suction which tends to draw the clothes in the tub into the holes through which the water is escaping, thereby clogging them and bringing the washing operation to a standstill.

In my patent application, Serial Number 301,541, filed August 23rd, 1928, in which I illustrated and described a washing machine which will wash clothes quickly and thoroughly, even though very soiled, solely by a vigorous and rapid movement of soapy water in the tank, I provided an unclogging mechanism which acts automatically to keep the machine in operation by dislodging whatever may clog the return water openings. This problem of suction arose in connection with the operation of the machine of said application because of the introduction of so much water rapidly at so many different points and the consequent necessity for the simultaneous escape of the same quantity of water back to the pump.

The primary object of my invention is to dispense with the need for an unclogging mechanism by providing proper openings in the tank for the escape of water to the pump so located that no clogging can take place.

In designing a washing machine that will wash clean all of the clothes in the ordinary family washing, including large pieces such as sheets and very soiled articles, solely by the movement of water introduced to the tank under pressure, a new problem has been created—that of clogging due to suction as explained above. I have succeeded in overcoming this clogging difficulty by so placing my water escape openings that the clothes in the tank cannot clog them. This has been accomplished chiefly by locating all of these holes or openings above the points where the water is introduced to the tank, and therefore above the irregular course taken by the clothes in the washing operation. By so locating them, the tendency of the suction to draw the clothes into the escape holes is overcome by the incoming streams of water forcing the clothes to follow a course which is lower than said holes. These escape openings are preferably all made in one side of the tank, and more preferably in that side where the water is introduced in horizontal streams.

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 construction 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 an elevation, partly in section, of a washing machine constructed in accordance with my invention.

Figure 2 is a sectional view on the line 2—2 of Figure 1.

Like numerals and letters of reference indicate corresponding parts in each figure.

The embodiment of my invention herein illustrated includes a frame which may be in the form of a cabinet or box having four metal side walls 12, one of which is usually constructed with a door opening and door (not shown) to provide for access to the interior of the cabinet, a bottom wall 13 and a top wall 14. The top wall 14 is preferably a rectangular frame providing within it a (preferably) rectangular opening that is occupied by a metal tank or receptacle 15, commonly called a tub. The chime of this tank is made with an out-turned flange 16 resting upon and secured to the top wall 14.

The tank 15, which is preferably rectangular in shape, has four side walls, two of which, 18 and 19, are shown in section in Fig. 2. These four side walls are integral with each other and with the bottom wall 20. This bottom wall preferably slopes downwardly at an appreciable angle towards the side wall 18. The side walls 18 and 19 and the bottom wall 20 are corrugated as shown in the drawings in order to provide a rough surface and thereby get a rubbing action when the clothes come in contact with this surface in their movement in the tank 15. In the bottom wall 20, preferably adjacent the side wall 18, two pipes 22 are connected to said bottom by soldering, through which water is delivered to the tank 15 under pressure in vertical streams. These pipes 32 are connected with a manifold 23 through which water is forced from a centrifugal pump 24, whose rotor is connected with and driven by the armature shaft 25 of an electric motor 26. Both the centrifugal pump 24 and the motor 26 are fixed to a base plate 27, which in turn is fixed to the bottom wall 13 of the cabinet. At the bottom of the tank adjacent the outlet end of the pipes 22 is a pipe 29 soldered to said bottom, through which the water may be drained from the tank 15 and discharged This pipe 29 is controlled by a valve 29ª, which is kept closed during the washing operation.

The manifold 23 also supplies (preferably) three pipes 31 which extend upwardly therefrom along the side 18 of the tank 15 to near the upper end of the latter where they are connected by laterally directed pipe terminals 32 with the interior of the tank 15. Water discharges from these pipe terminals 32 in forceful horizontal streams into the tank 15.

Above the terminals 32 an opening is made in the tank 15 which is covered by a removable plate 34 held in place by a pocket 34ª formed on the inner surface of the side 18. This plate 34 has a multiplicity of perforations 33 in it through which the water escapes back to the pump 24. The normal water level of the tank for the washing operation is, of course, sufficiently high so that the water reaches these perforations 33 and escapes through them into a hollow casting or housing 35 which is soldered and riveted to the side 18 on the outside of the tank 15. From the housing 35, the water then passes through a return pipe 36 back to the pump 24 as shown, from which it is again pumped back into the tank. This movement of water is preferably continuous during the washing operation, although it could be made intermittent.

Upon the outer side 19 of the tank 15 is soldered, riveted or otherwise fastened, a single pipe terminal 40 pointing obliquely downward as shown in Figure 2 of the drawings, delivering water into the tank through the opening 41 in a downwardly directed stream. If desired, a plurality of pipe terminals may be used delivering water in a plurality of downwardly directed streams. Water is supplied to this pipe terminal 40 by the delivery pipe 42 which is connected with the manifold 23 previously referred to.

A cover 50, hinged at 51 to lugs not shown, is provided for closing the top of tank 15.

In Figure 1 of the drawings, mechanism is shown to drive a wringer (not shown), comprising a base 53 fixed to the base plate 27, a shaft 54 in a housing 55, the lower end of said shaft 54 being connected by gearing with the armature shaft of motor 26.

In using the machine, water is supplied to the tank 15 until the system is full and the water in the tank is at a level with the highest of the perforations 33, and the soiled clothes are dropped in. Then the motor and pump are started in operation by closing the usual switch (not shown) that is in the circuit of the motor, which causes water to flow from the pump 24, through the various pipes 22, 31, and 42 to the tank 15, which immediately raises the level of water in the tank, which raised water escapes through the perforations 33 and runs back to the pump 24. This circulation of the water is continuously repeated until the clothes are washed clean.

During the operation of the machine three jets of water are discharged horizontally across the upper portion of the tank 15 from the pipes 31; a single downwardly oblique jet of water is discharged through the opening 41 opposite the outlets of said pipes 31, and two jets of water are discharged upwardly through the pipes 22 at the bottom of the tank. These jets of water cause abrupt and vigorous movements of the body of water and clothes in the tank, moving them in fitful fashion in an uneven, triangular path as they tumble about.

If, for sanitary reasons it is desired to remove the plate 34, and wash all foreign substances from it, this may easily be done by sliding it out of the pocket 34ª.

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 forcibly delivering liquid to said receptacle and receiving it therefrom, said receptacle having provisions for the introduction of an upward stream and a horizontal stream of liquid to it, and having provision located above the introducing point of said streams for permitting 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 forcibly delivering liquid to said receptacle and receiving it therefrom, said recep-

tacle having provisions for the introduction of streams of said cleansing liquid upwardly from the bottom and horizontally from a plurality of openings at the side to cause a movement of said articles, and having openings located above the course taken by said articles in their movement to permit the escape 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 forcibly delivering liquid to said receptacle and receiving it therefrom, said receptacle having provisions for the introduction of an upwardly directed stream, a horizontally directed stream and a downwardly directed stream, and provision located above the introducing point of said streams to permit said liquid to escape and return 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 forcibly delivering liquid to said receptacle and receiving it therefrom, said receptacle having an opening at the bottom spaced from the center, a plurality of openings at the side horizontally adjacent said bottom openings and an opening at the side substantially opposite said plurality of side openings, all of said openings serving to introduce said liquid to said receptacle, and a plurality of openings in the side located above the said first mentioned plurality of side openings to permit the said liquid to escape and return to said means.

5. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, a pump, said receptacle having provisions for introducing said liquid into it at the bottom and side thereof from said pump, and having a plurality of openings located above said introducing provisions for permitting the escape of said liquid from the receptacle to said pump.

6. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means to force said liquid to said receptacle and receive it again, said receptacle having provisions for the introduction of a stream of said liquid upwardly, another stream horizontally and another stream obliquely downward and provision located above said horizontal stream to permit the escape of said liquid from said receptacle to said means.

7. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcibly delivering liquid to said receptacle and receiving it therefrom, said receptacle having provision for introducing said liquid into it from said means at the bottom and a plurality of sides thereof, and provision located higher than said introducing provision in one of said sides for permitting the escape of said liquid from said receptacle to said means.

8. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcibly delivering liquid to said receptacle and receiving it therefrom, said receptacle having provision for the introduction of said cleansing liquid from the bottom and from a plurality of points at the side to cause said articles to follow a course of movement, and provision located higher than said course of movement of said articles to permit the escape of said liquid from said receptacle and return to said means.

9. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means for forcibly delivering said liquid to said receptacle and receiving it therefrom, said receptacle having provisions for the introduction of said liquid at widely separated points to cause said articles to be moved in a cycle in said receptacle, and provision located above said cycle of movement to permit said liquid to escape from said receptacle to said means.

10. A clothes washing machine comprising a receptacle adapted to receive a cleansing liquid and the articles to be cleaned, means to force said liquid to said receptacle and receive it again, said receptacle having provisions for the introduction of a stream of said liquid upwardly, another stream horizontally and another stream downwardly, and provision located above said horizontal stream to permit the escape of said liquid from said receptacle to said means.

OTTO T. DEHLE.