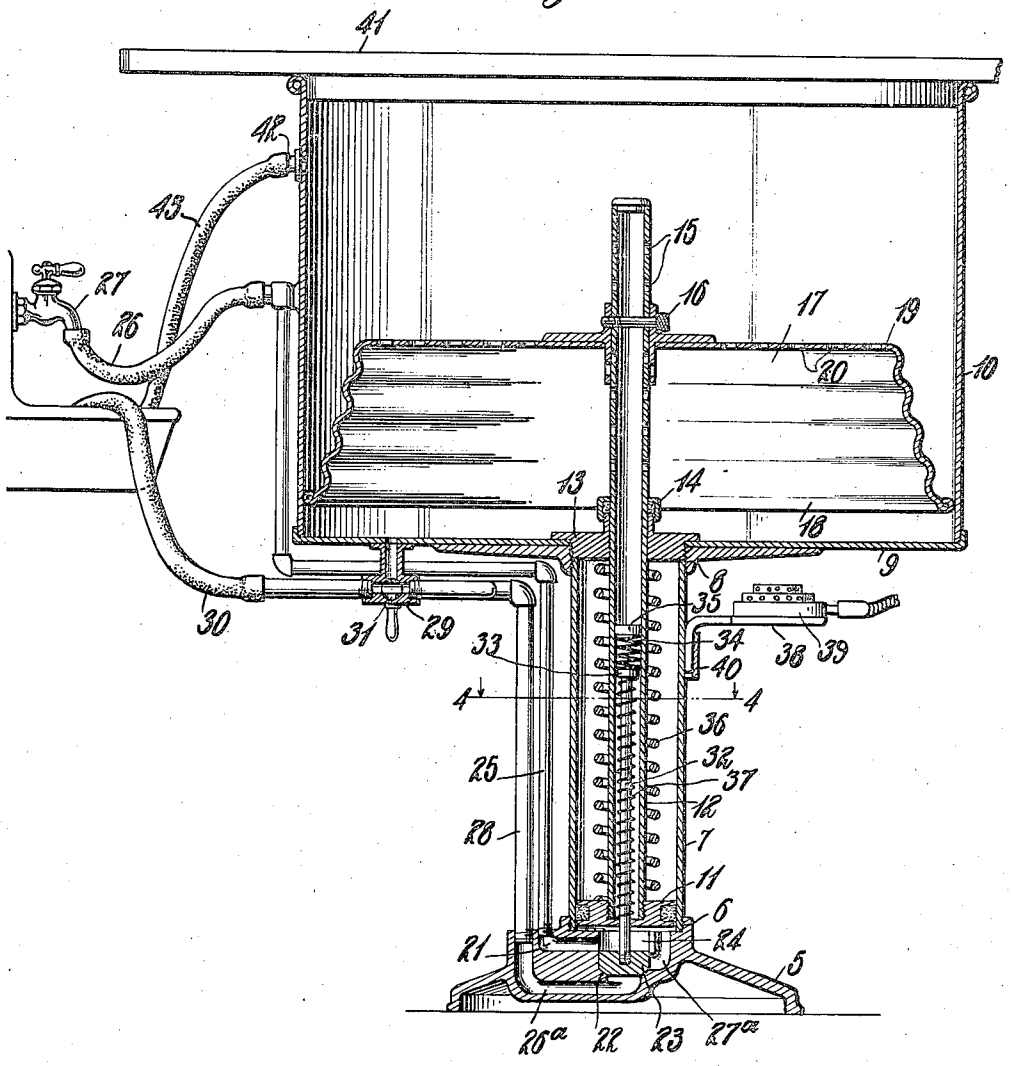
Jan. 22, 1924. 1,481,550

A. E. HALL

WASHING MACHINE

Filed Oct. 30, 1920 3 Sheets-Sheet 1

Fig. 1.



Witnesses

W. C. Fielding.

Augustus B. Coppes

Inventor

Allen E. Hall

By Joshua R. H. Potts

His Attorney

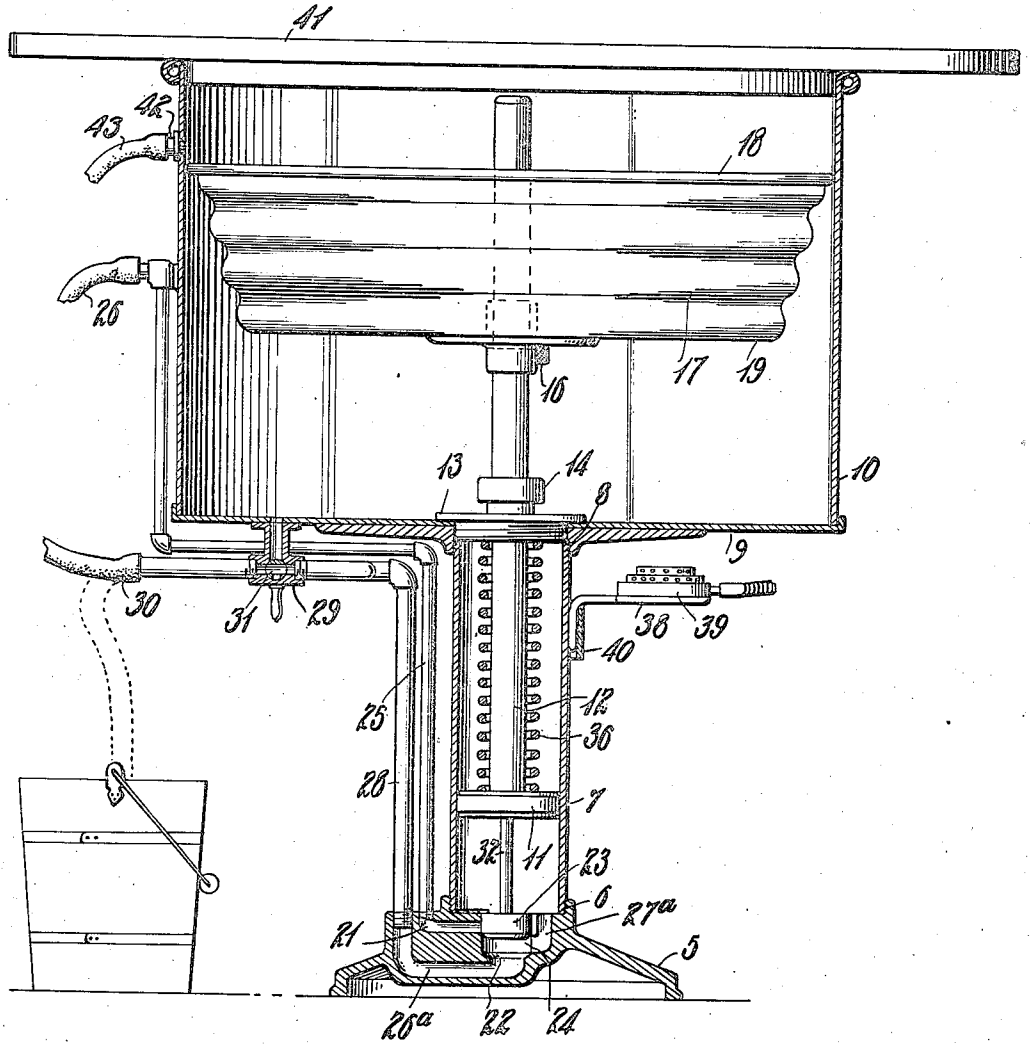
Jan. 22, 1924. 1,481,550

A. E. HALL

WASHING MACHINE

Filed Oct. 30, 1920 3 Sheets-Sheet 2

Fig. 2.



Witnesses

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Jan. 22, 1924. 1,481,550

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WASHING MACHINE

Filed Oct. 30, 1920 3 Sheets-Sheet 3

Fig. 3.

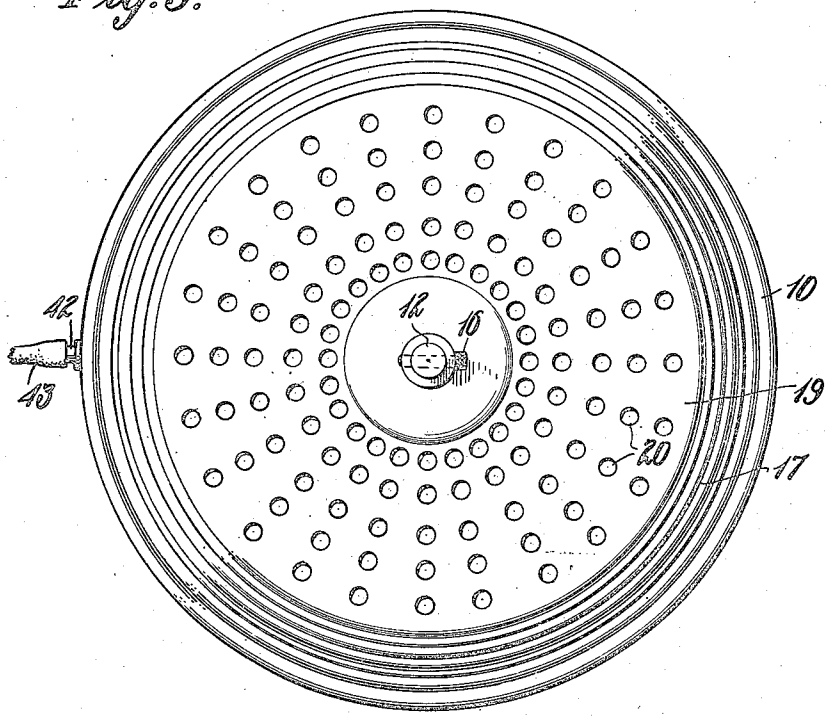
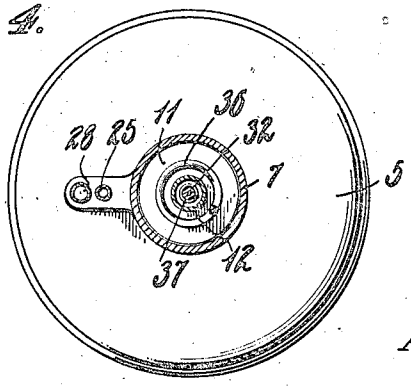


Fig. 4.



Witnesses

W. C. Fielding.

Augustus B. Coppee

Inventor

Allen E. Hall

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His Attorney

Patented Jan. 22, 1924. 1,481,550

UNITED STATES PATENT OFFICE.

ALLEN E. HALL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HALL WHEEL CORPORATION, A CORPORATION OF DELAWARE.

WASHING MACHINE.

Application filed October 30, 1920. Serial No. 420,616.

To all whom it may concern:

Be it known that I, ALLEN E. HALL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Washing Machines, of which the following is a specification.

One object of my invention is to provide an improved washing machine of a simple and durable construction which can be operated by water pressure when coupled to an ordinary household faucet; the arrangement being such that the agitator can be quickly changed to permit the machine to wash clothes or dishes.

Another object is to so construct my improved machine that it will have comparatively few parts; the parts being of a durable and simple construction.

A still further object is to so construct my improved machine that by the movement of a three-way cock, the material being washed can be rinsed by circulating clear water therethrough and the water can be readily discharged.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which

Figure 1 is a sectional elevation of my improved washing machine arranged for washing clothes,

Figure 2 is a view of the same general character as that shown in Figure 1 with certain of the operating parts having been moved into various positions which they occupy during the operation of the machine; the agitator being shown in a reversed position to form a container for washing dishes or other articles,

Figure 3 is a top plan view of my improved machine with the table top cover removed, and

Figure 4 is a section taken on the line 4—4 of Figure 1.

Referring to the drawings, 5 represents a base which may be made of cast metal having a screw threaded hole or flange seat 6 in its top in which fits the lower screw threaded end of an upright cylinder 7; the top end of said cylinder being screw threaded and fitting within a screw threaded hole 8 in the bottom 9 of a tank 10. The cylinder 7 provides a standard with the base 5 for the tank 10 and also forms an internal guideway for a piston 11 which is screwed on the lower end of a tube 12; said tube 12 having its lower portion positioned within the cylinder 7 and having its upper end slidable through a plug 13 which is screwed in the upper part of the hole 8 in the bottom of the tank 10. The plug 13 includes a stuffing box 14. A part of the tube 12 extends upwardly within the tank and has a series of oppositely disposed or diametrically opposed holes 15 to permit a screw or pin 16 to be inserted therethrough; said pin serving to attach an agitator 17 to the tube at any desirable position either in the inverted position as shown in Figure 1 or the reverse position as shown in Figure 2. The agitator 17 provides a container which is open at its end 18 and closed at its end 19 with the exception of perforations 20. The side wall of the agitator is corrugated circumferentially and tapers toward the end 19; the opposite end 18 being of a diameter substantially equal to the internal diameter of the tank 10. The base 5 is preferably made of cast metal and is cored to provide an inlet passage 21 which leads to the bottom of a valve seat 22 upon the top of which is adapted to rest a valve 23; the latter being slidable vertically in a guideway 24 as shown in the two positions illustrated in Figures 1 and 2. The valve 23 is of such height that when resting on the valve seat 22, it will expose the inlet passage 21 to the guideway 24 and to this inlet passage 21 is connected an inlet pipe 25 which may be connected through the medium of a hose 26 to a faucet 27 as shown in Figure 1. When the valve 23 is raised, for example as shown in Figure 2, the side of the valve will cut off the inlet passage 21 and will expose the discharge passage 26 to a discharge by-pass passage 27^a. The discharge passage 26^a in the base 5 is connected by a pipe 28 through the medium of a T-fitting 29 with a discharge hose 30 which may be led to any suitable drain.

The T-fitting 29 is interposed in the length of the discharge pipe 28 and secured to the bottom of the tank 10 and communicates therewith; said T-fitting including a three-way cock 31 which may be moved into different positions as will hereinafter be described. The valve 23 has a stem 32 which

leads upwardly through the piston 11 and tube 12. The top of the stem 32 has a head 33 thereon which abuts a spring 34; said spring being positioned between the head 33 and a partition 35 in the tube 12. This partition 35 may be made of a disk which is soldered to the interior of the tube and serves as an abutment for the spring 34 and also to prevent water from passing through the tube. A heavy spring 36 surrounds the tube 12 and has its opposite ends respectively engaging the piston 11 and plug 13 and serves to move the piston 11 downwardly. An extremely light or weak coiled spring 37 surrounds the stem 32 and engages the head 33 and the piston 11. It will be understood that this spring 37 is not sufficiently strong to lift the valve 23 during the first part of the upward movement of the piston 11 which occurs when the water is admitted into the cylinder through the passage 21. However, after the spring 37 has been compressed, it will cause the valve 23 to be lifted. I preferably provide a gas burner or other heating agent 38 which is provided with a hooked bracket 39 adapted to engage a socket 40 on the cylinder 7; said heating agent being located under the bottom of the tank for the purpose of keeping the water within the tank hot. Furthermore I also provide the tank 10 with a cover which may be made in the form of a table top 41.

Considering that my improved machine is to be operated for washing clothes and that the three-way cock is in the position shown in Figure 1, the agitator 17 is first removed from the top of the tube 12 by removing the pin or screw 16, after which the clothes are packed in the tank around the tube and the agitator is then placed upon the tube and pressed downwardly so as to compress the clothes. The screw 16 is then inserted through the agitator and oppositely disposed holes 19. Hot soapy water can be poured into, inserted, or produced within the tank and the machine is then ready for operation.

The water under pressure is admitted through the inlet pipe 25 and inlet passage 21 and effects the raising of the piston 11, tube 12 and agitator 17; the valve 23 during said upward movement remaining closed due to the pressure of the inlet water on the top of the valve being greater than the resisting pressure of the spring 37. The spring 36 will be compressed during the upward movement of the piston and when the spring 37 is compressed sufficiently it will raise the valve 23 and cut off the inlet passage and open the by-pass passage 27^a to the discharge passage 26^a. The water within the cylinder 7 below the piston 11 will then be forced outwardly through the discharge passage 26^a, discharge pipe 28 and hose 30 by the action of the spring 36 and during the downward movement of the tube 12, the spring 34 will engage the head 33 of the stem 32 and move the valve 23 downwardly upon its seat and again expose the inlet passage 21 and close the discharge passage 26^a to the by-pass passage 27^a and the piston 11 will again be raised and the action repeated. In this manner the agitator 17 which produces a pounder or vacuum cup effect, receives a vertical reciprocating movement and the clothes in the tank will be compressed and permitted to expand in such manner as to thoroughly wash them.

By having the side wall of the agitator corrugated and tapering, the clothes will be slightly rubbed and compressed, without injury thereto and the perforations 20 in the end 19 permits a circulation of water through the clothes to cause the water to completely penetrate the mass of clothes; thus adding greatly to the thoroughness of the washing action.

When it is desired to rinse the clothes, the three-way cock 31 can be turned a quarter turn to the right from the position shown in Figures 1 and 2, and the discharge water will pass upwardly through the pipe 28 into the tank and I preferably provide an overflow connection 42 with the tank 10 adjacent its top; said connection including a hose 43 which can be connected to any suitable drain. If it is desired to drain the tank, the hose 30 can be inserted in any suitable receptacle or if desired can be connected with a lower drain (not illustrated) and by turning the three-way cock a quarter turn to the left from that shown in Figure 1, the water within the tank will drain outwardly through the hose 30 and the tank can thus be emptied.

If it is desired to wash dishes or other articles where it is not desired to compress or squeeze the articles, the agitator 17 can be reversed and placed upon the tube in a manner shown in Figure 2 and when in this position the agitator forms a container in which the dishes or other articles may be placed. By making the parts as above described, the cylinder can be easily attached to or detached from the tank and base and the plug 13 can be easily inserted or removed. Also when not desired for use the burner 38 can be removed by merely lifting the hook bracket 39 out of the socket 40.

A machine made in accordance with my invention can be quickly and cheaply manufactured and the parts can be readily assembled. Furthermore if a repair is necessary the same can be easily made by disconnecting the parts.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not

limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

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

1. A washing machine having a tank and an agitator in the tank, including means operative by liquid under pressure to move said agitator in the tank; a discharge conduit to discharge the liquid from said means; and means optionally operative for directing said liquid after it has operated said first means, either into said tank so as to serve as a rinsing liquid or discharging it through said discharge conduit; substantially as described.

2. A washing machine having a tank and an agitator in the tank; reciprocable means connected with said agitator; means for directing liquid under pressure against said reciprocable means to move it with said agitator in the tank; a conduit for discharging the liquid from said directing means; and a 3-way valve interposed in said conduit and connected with said tank, said valve being optionally operative for discharging said liquid through said conduit or for deflecting said liquid into said tank.

3. Apparatus, adapted for use in connection with a washing machine having a tank and an agitator in the tank, including means operative by liquid under pressure to move said agitator in the tank; means forming a discharge conduit for liquid discharged from said first means; and a 3-way valve communicating with said tank and conduit and optionally operative to deflect said discharged liquid into said tank or continue said liquid through said discharge conduit to its outlet end, said valve also being optionally movable into another position for cutting off said discharge liquid and forming communication between said tank and the outlet end of said conduit whereby the liquid within the tank will drain through said outlet end; substantially as described.

4. A washing machine including a tank; an agitator within the tank; a cylinder; a piston in said cylinder and connected to said agitator; means for directing liquid under pressure into said cylinder to move said piston; means for discharging said liquid from said cylinder; and means adjustable for directing said discharge liquid into said tank to serve as a rinsing liquid, or to direct said discharge liquid out through said discharge means, or to drain the tank; substantially as described.

5. A washing machine including a tank having a hole in its bottom; an agitator in the tank; a cylinder screwed in said hole and depending below said tank; a plug screwed in the top of said hole and having a stuffing box; and operative means in said cylinder having a portion extending through said stuffing box and connected to said agitator; substantially as described.

6. A washing machine including a tank; an agitator within the tank; a cylinder; a piston in said cylinder connected to and supporting said agitator; means for directing liquid under pressure into said cylinder to move said piston; means for discharging said liquid from said cylinder; valve means for directing said discharge liquid into said tank to serve as a rinsing liquid, said valve means being also adjustable to drain the tank directly or to drain off said discharged liquid from said cylinder directly without leading it into the tank; substantially as described.

7. A washing machine including a tank; an agitator within the tank; drain means for the tank; a valve in said drain means; means operative by liquid under pressure to reciprocate said agitator in the tank; and means for directing said liquid through said valve into said tank after it has operated said first means; substantially as described.

8. A washing machine including a tank; a reciprocating member within said tank and having a series of holes positioned at various levels; an agitator open at one end and closed at the other; and a pin extending through a part of said agitator and capable of being placed in any of said holes with the open end of the agitator either at the top or the bottom; substantially as described.

9. A washing machine including a tank; an agitator within the tank; a cylinder; a piston in said cylinder and connected to said agitator; valve means for intermittently directing liquid under pressure into said cylinder to move said piston, and for releasing said liquid; a spring for returning said piston moved by said liquid under pressure; a conduit for discharging said liquid released from the cylinder; a connection between said conduit and said tank; and a valve in said conduit adjustable to direct the liquid to the outlet end of said conduit or through said connection to said tank.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALLEN E. HALL.

Witnesses:
CHAS. E. POTTS,
ELIZABETH GARBE.