Jan. 2, 1934. A. B. MILLER 1,941,706

WASHING MACHINE

Filed March 17, 1930 3 Sheets-Sheet 1

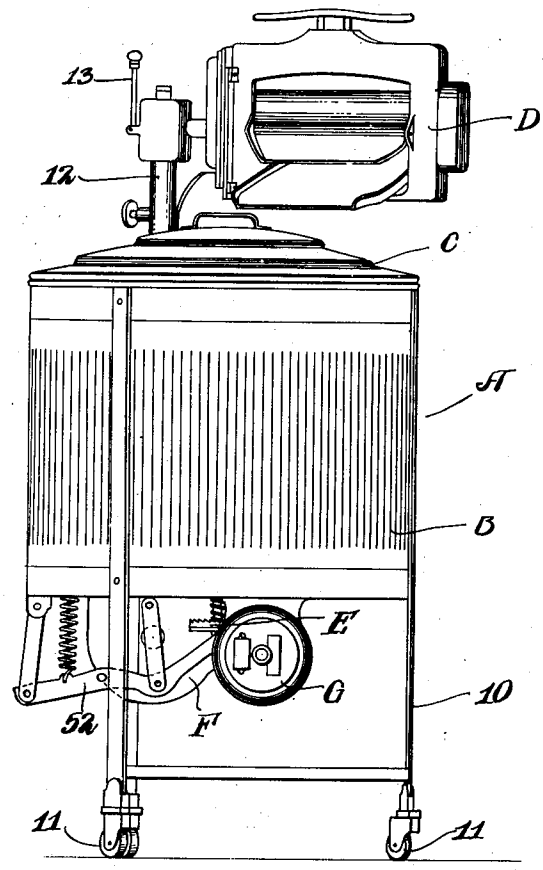


Fig. 1.

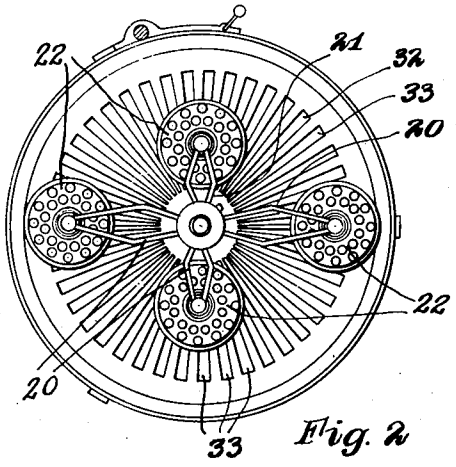


Fig. 2.

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Jan. 2, 1934. A. B. MILLER 1,941,706

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Filed March 17, 1930 3 Sheets-Sheet 2

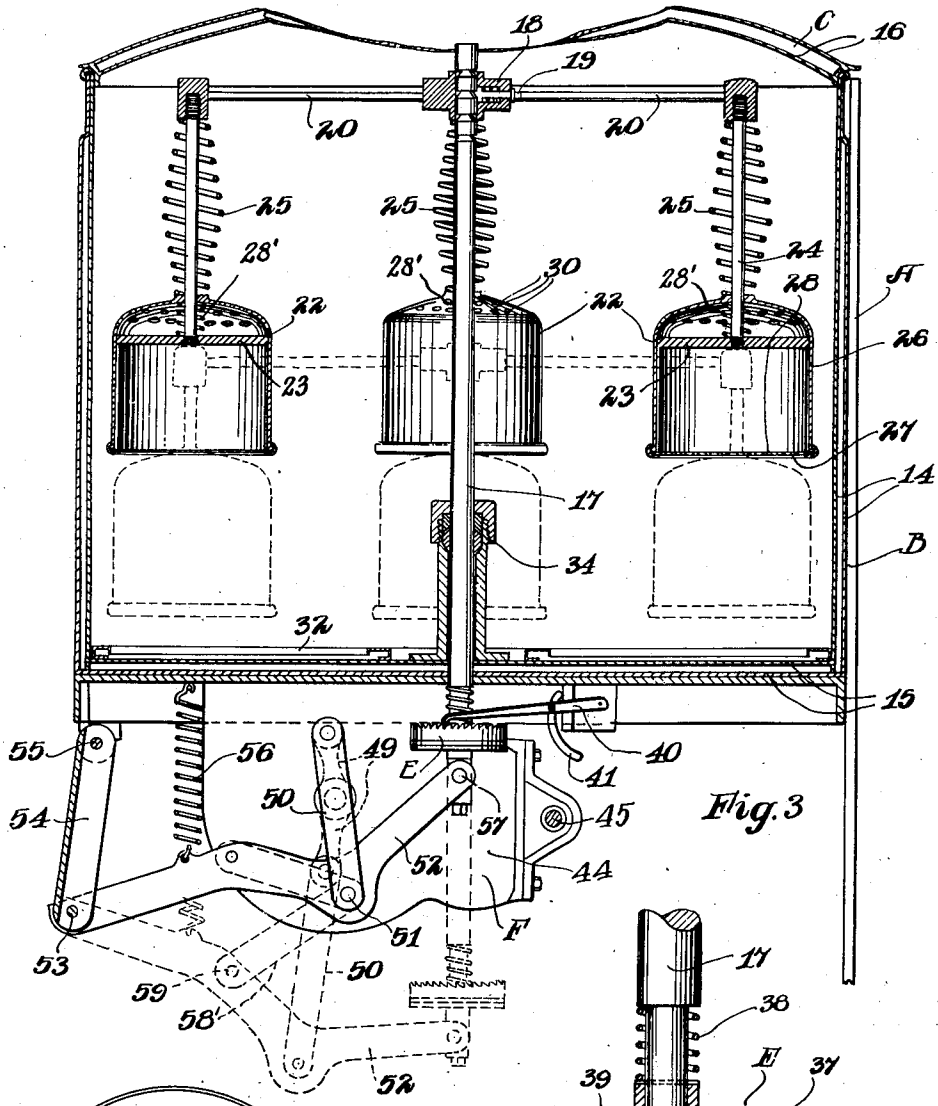


Fig. 3

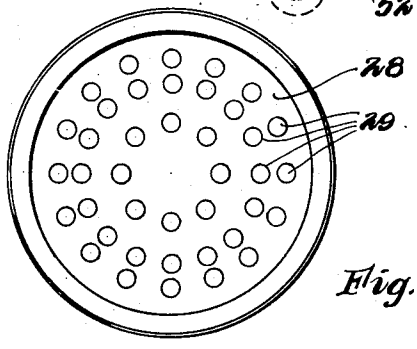


Fig. 4

Fig. 5

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Jan. 2, 1934. A. B. MILLER 1,941,706

WASHING MACHINE

Filed March 17, 1930 3 Sheets-Sheet 3

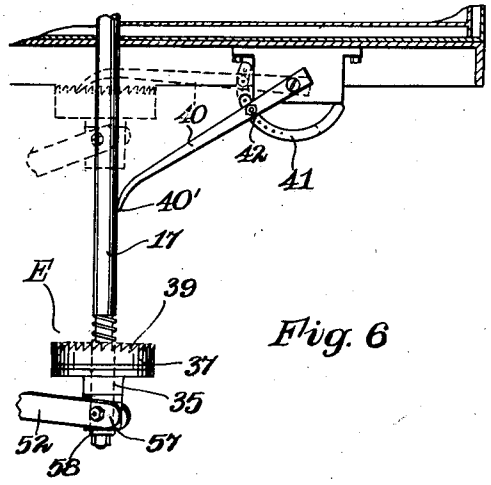


Fig. 6

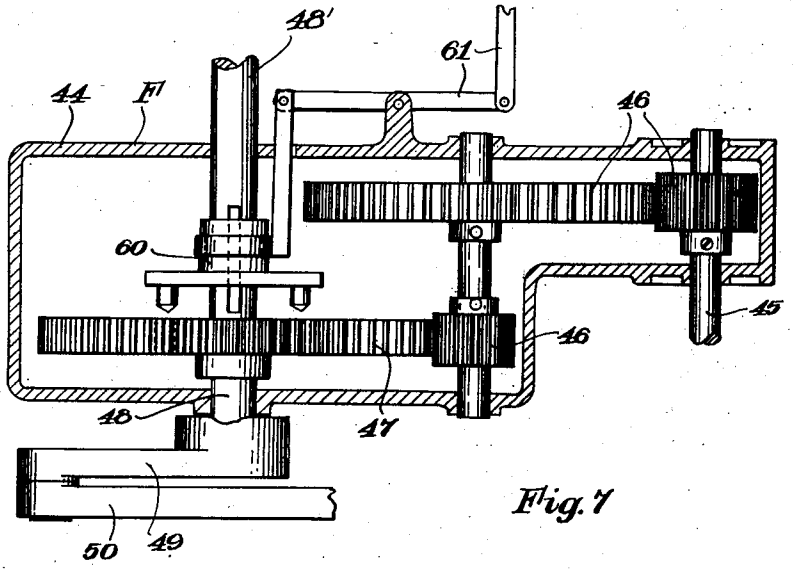


Fig. 7

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UNITED STATES PATENT OFFICE

1,941,706

WASHING MACHINE

Andrew B. Miller, Baldwin, Wis.

Application March 17, 1930. Serial No. 436,382

10 Claims. (Cl. 68—19)

My invention relates to a washing machine having means to wash clothes in the same in such a manner as to thoroughly cleanse the clothes by a peculiar and distinct operating means which is adapted to pump the water back and forth through the clothes, thoroughly cleansing the same.

A feature of the invention resides in a safety means for protecting the operating mechanism of the washer so that not only is the electric motor which operates the moving parts protected, but also the different co-operating parts so that the machine cannot be jambed and injured in the washing operation. This is an important feature of my invention and it accomplishes long desired results in providing a washing machine particularly adapted for family use wherein the parts may operate without danger of injuring or breaking any of the parts or burning out the motor.

The invention further provides a means of rotating the operating washing pumps which are superimposed above the perforate bottom and reciprocate in vertical and horizontal planes. My washing machine is provided with means wherein the washing pumps or cups are arranged so as to travel in different circumferential positions, thereby virtually covering an entire area of the bottom in the traversing of the pumps within the tub of the machine so that the entire contents of the tub are thoroughly washed whether there are more or less pieces within the same.

These features together with other details and objects of the invention will be more fully and clearly set forth in the specification and claims.

In the drawings forming part of this specification:

Figure 1 is a side view of my washing machine.

Figure 2 is a plan view of the same with the cover and wringer removed.

Figure 3 is a vertical enlarged cross section of a portion of my washing machine.

Figure 4 is a bottom view of one of the washing cups or pumps.

Figure 5 is a sectional detail of a portion of my machine.

Figure 6 is a detail of a portion of my washing machine, showing some of the parts in dotted position.

Figure 7 is a sectional detail of the transmission of my washing machine.

My washing machine A is designed with a washing tub or body B having a cover C and a supporting frame 10 which is mounted upon casters 11 so that the washing machine A is portable for use in the homes to be moved into any desired position.

The washing machine A is provided with a wringer standard 12 operated by the lever 13 and the wringer D may be of any suitable type so as to be operated when desired by the lever 13.

The tub or body B of the washing machine A may be provided with an insulating structure such as the double wall 14 and the double bottom 15, together with the double top walls 16 for the cover C. This acts to provide an insulated body so as to keep the water hot as long as possible within the washer A and thereby facilitate the washing of the clothes within the same.

The washer A is provided with an operating standard shaft 17 which may be positioned axially within the tub B and which is adapted to reciprocate up and down. The shaft 17 carries the head collar member 18 which is adjustably positioned by means of the bolt 19 on the upper end of the shaft 17 and arms 20 and 21 project horizontally from the head 18 and are adapted to support the washing pumps 22 in a manner so that the pumps depend from the arms 20 and 21. The arms 20 and 21 are of different lengths so as to place the washing pumps or cups 22 in a position so as to cover virtually the entire area of the bottom of the tub B, in the traversing of the pumps 22 as they are operated as will be more fully hereinafter set forth.

The washing pumps 22 have a structure of a nature to provide a series of individual pumps within the tub B which are adapted to pump the water back and forth through the clothes placed in the tub. Each pump or cup 22 is provided with a piston 23 which is carried by the shaft 24. The shaft 24 depends from the outer ends of the arms 20 and 21 and by means of a coil spring 25 positioned between the ends of the arms and the top of the pumps 22, the pumps 22 are held normally in downward position. The springs 25 permit the casing 26 of the pumps 22 to move upward against the spring 25 when the pumps are moved down by the shaft 17 against the clothes. This will force the piston 23 toward the open end 27 of the pumps 22 and thus force water and air in the pumps 22 through the clothes in the tub. As the pumps 22 are raised the casing 26 will tend to move to normal position and by means of the cushioning springs 28' the casing 26 of the pump 22 is cushioned against backlash by the lifting operating and the operation of the spring 25. The upstroke or lifting of the pumps 22 provides a suction in the pumps 22,

drawing the water through the clothes as the pumps 22 are raised. The open end 27 of the pump 22 is closed by a member 28 which is formed with a multiplicity of openings 29 so that the pumps may operate in the manner set forth and yet prevent the clothes from entering into the inner chamber of the pump. The upper end of the pump is also provided with openings 30 to permit the air and water to pass through the same.

Thus I provide a series of pumps 22 which force water through the clothes in their reciprocating operation in a very effective manner and which have the resilient structure so as to insure the operation of each pump to carry the water back and forth through the clothes and thus thoroughly wash the same. The operation of these pumps does not in any way tend to injure the finest fabric even though considerable force and suction is applied in the washing operation. The long and short arms 20 and 21 position the pumps in a manner so that they will cover the area of the bottom of the washer.

I provide a corrugate bottom 32 which is formed with radial openings 33. This bottom 32 may be removed in cleaning the tub B if it is desired. The corrugate bottom 32 normally rests upon the main bottom of the tub B and may be readily lifted out of the tub B when it is desired.

The operating standard shaft 17 extends through the bottom of the tub B and is provided with a packed joint 34 of the ordinary nature. The lower end of the shaft 17 is adapted to carry the operating clutch E which includes the fixed collar 35 held rigidly with the shaft 17. Upon the upper surface of the collar 35 I provide a clutch lining washer 36 of any suitable nature, such as is used in clutches for automobiles, or of a like nature, where the clutch material 36 is made of suitable wear resisting material. The clutch E is provided with an operating collar 37 which is positioned upon the clutch lining washer 36 and is held bearing against the same by a spring 38 so that normally the operating collar 37 is held into frictional contact with the lining 36 and the lining 36 is rigidly connected in a suitable manner to the fixed collar 35.

The operating collar 37 is formed with ratchet teeth 39 on one side thereof which are adapted to be engaged by the freely disposed operating dog 40 which is supported on the bottom of the tub B. The dog 40 is formed with an adjustable stop arm 41 of an arcuated construction and by means of the set screw 42 the arm 41 can be adjusted so as to be set into different positions. The stop 41 limits the downward movement of the dog 40, as illustrated in Figure 6. By adjusting the stop 41 the dog arm 40 may be adjusted so as to engage more or less of the teeth 39 on the operating collar 37 of the clutch E.

When the shaft 17 is moved downward the dog 40 disengages from the teeth 39, as illustrated in Figure 6, and the dog 40 hangs in position to again engage the teeth 39 when the shaft 17 is raised and as the free end 40' of the dog 40 engages with the teeth 39 and the shaft 17 continues to move upward, the operating collar 37 is adapted to rotate the fixed collar 35 which rotates the shaft 17 to change the position of the washing pumps 22 in the tub B. Thus each time that the shaft 17 is reciprocated up and down, the position of the washing pumps 22 is changed automatically. With this in mind and the fact that the pumps are in staggered or different circumferential positions, will clearly point out that any clothes within the washer B are thoroughly and completely washed in the operation of my washer A.

The structure of the clutch E is such that at any time should a jamb of clothes take place within the washer B, the clutch E may slip in either direction, thus taking the strain off of the operating motor and the transmission and operating parts which will be later described. This is a very important feature of my washer in conjunction with the spring operating pumps 22 because it prevents any accidents such as breaking of the parts or bending the same, and it insures the operation of the washer A in a manner so that it will virtually clear itself of any jambing which may take place in its operation. The clearing will be accomplished by the continued operation of the washer A which through the suction and force of the operating pumps 22 will tend to remove the jamb or piling of the clothes within the washer tub B. The advantages of these features will be very apparent and I have found my washer to accomplish these results in use.

The transmission F of my washer A is inclosed within a suitable casing 44, positioned beneath the tub B in a suitable manner. The motor G is adapted to operate the transmission F and is connected thereto by the shaft 45 as illustrated in Figures 3 and 7 of the drawings. The transmission gears 46 operate the gear 47 so as to operate the driving shaft 48. The side 48' of the shaft 48 operates the wringer in the ordinary and well known manner. The other end of the shaft 48 is provided with an operating arm or link 49 and which is connected to the operating link 50. The operating link 50 is connected at 51 to the operating arm 52 so that in the operation of the transmission F the arm 52 is reciprocated up and down below the washing machine into the various positions, such as illustrated in full and dotted lines in Figure 3.

The operating arm 52 is pivotally connected at 53 to the swinging link support 54 which is pivotally connected at 55 to the bottom of the tub B and a coil spring 56 assists in normally raising the arm 52. The free end of the arm 52 is pivotally connected at 57 to a collar 58 carried by the lower end of the shaft 17. Thus in the reciprocation of the lever 52 the shaft 17 is raised up and down in the washer A. A guide link, such as 58', is connected to the lever 52 at 59 and the other end of the link 58' is connected to the casing F. This guide link 58' merely acts to guide and to help hold the lever 52 so that the free end will not put any undue strain on the pivot point 57 in its operation.

The transmission F is provided with a suitable clutch 60 which is operated by the levers 61 to throw the transmission gear 47 into operation to rotate the shaft 48. As illustrated in Figure 7, the clutch 60 is keyed to the shaft 48', and may be moved into or out of engagement with the gear 47 freely mounted on the shaft 48'. When the clutch 60 is released the shaft 48 is free to turn, permitting the spring 56 to raise the shaft 17 with the cups or operating pumps 22. The shaft 17 is free to be rotated in the desired direction and the operating parts are always protected by the clutch E so that the motor will not be burned out in the operation of the washer A, even under severe load or jambing and the parts will not be bent. Either the clutch E can slip or the springs 25 will compensate for the movement of the pumps 22 and thus no damage can

ordinarily be done to the parts of my washer. These are features of extreme importance in the successful operation of a washing machine where it is subjected to various uses and abuses and where ordinarily it is operated by the housewife who is not ordinarily familiar with mechanical devices. In the hands of such operators and in fact in the hands of most any operator with ordinary judgement, my washer is adapted to operate in a very satisfactory and desirable manner because of its particular construction and arrangement of the parts.

The pumps 22 have an efficiency in cleaning the clothes in my washer which cannot be accomplished by ordinary suction cups and the removable perforate bottom acts to space the clothes from the bottom proper of the washer to permit the washing fluid to circulate around and between the clothes.

In accordance with the patent statutes I have described the principles of operation of my washer and while I have designated certain details and construction, together with the peculiar arrangement of the parts, I desire to have it understood that the illustrations are only suggestive of a means of carrying out my invention and that other uses and variations may be applied within the scope of the following claims without departing from the purpose and intent of the invention.

I claim:

1. A washing means having a washing tub, a series of spring washing pumps, means for automatically reciprocating said pumps vertically, ratchet means engaged during a portion of upward reciprocation of said pumps for moving said pumps horizontally, and a friction connection on said ratchet to release the horizontal movement of said pumps when subjected to unusual strain at any time.

2. A washing machine including, a washing tub, a series of washing pump cups disposed in said tub at different circumferential positions in relation to each other to cover substantially the area of the bottom of said washing tub, the cups on diametrically opposite sides of the center being equidistant therefrom and means for reciprocating said pumps vertically and horizontally.

3. A portable washing machine comprising, a washing tub, means for portably supporting said tub, a series of washing pump cups, means for reciprocating said cups up and down within said tub, ratchet means for moving said cups into different horizontal positions simultaneously with the last portion of the upward movement, and a friction clutch in said means operable under unusual strain to release said ratchet.

4. A washing pump cup for washing machines including, a cup-shape casing, said casing having openings in the bottom and the top of said casing, a piston operable within said casing, a compression spring for holding said casing in position in relation to said piston, and a cushioning compression spring within said casing acting against said first named spring to cushion the operation of said piston.

5. A washing machine pump cup including, a supporting shaft, a casing, a spring on said shaft adjacent said casing, a piston carried by said shaft disposed within said casing, a cushion spring carried by said shaft acting in opposition to said first named spring to cushion the operation of said piston in said casing, and perforate top and bottom walls for said cup permitting air and fluid to pass in and out of said casing in the operation of said piston and preventing clothes from entering said casing.

6. A washing machine comprising, a washing tub, a series of washing cups provided with pistons within said tub, means for reciprocating said cups up and down in said tub, means for supporting said cups for reciprocation, spring means for raising said supporting means when released from vertical reciprocating movement, a ratchet operating means for moving said pumps in a horizontal plane, and a clutch in said ratchet operating means having releasing means to cause the releasing thereof when obstructions prevent movement in a horizontal plane.

7. A washing machine comprising, a washing tub, a series of washing pump cups within said tub, means for supporting said cups vertically reciprocable, means for reciprocating said pumps up and down within said tub, friction clutch and ratchet means operated by said reciprocating means for moving said pumps in a horizontal plane, and adjustable means acting in combination with said friction clutch and ratchet means to vary the horizontal movement of the cups.

8. A washing machine including, washing cups, and means for moving said washing cups transversely including, an operating shaft by which said cups are supported, a friction plate secured against turning on said shaft, ratchet means rotatable on said shaft held under spring tension against said plate, an operating pawl, and means for adjusting the movement of said pawl to engage more or less teeth to vary the horizontal moving of the washing cups in the washing machine.

9. A washing machine including, a vertically reciprocable shaft, a flange secured to said shaft, a ratchet rotatably mounted on said shaft adjacent said flange, friction disk means between said flange and said ratchet, spring means on said shaft forcing said ratchet toward said flange, and pawl means adapted to engage said ratchet as said shaft is reciprocated to rotate the shaft.

10. A washing machine including, a vertically reciprocable shaft, a ratchet mounted thereupon to rotate said shaft, a pawl adapted to engage said ratchet near the upper end of its reciprocation to rotate said ratchet, and means for adjusting the position of said pawl to engage said ratchet at a point nearer to or farther from the limit of its upward stroke.

ANDREW B. MILLER.