Dec. 30, 1941. J. W. CHAMBERLIN ET AL 2,267,785

CLEANING MACHINE

Original Filed March 6, 1937 2 Sheets-Sheet 1

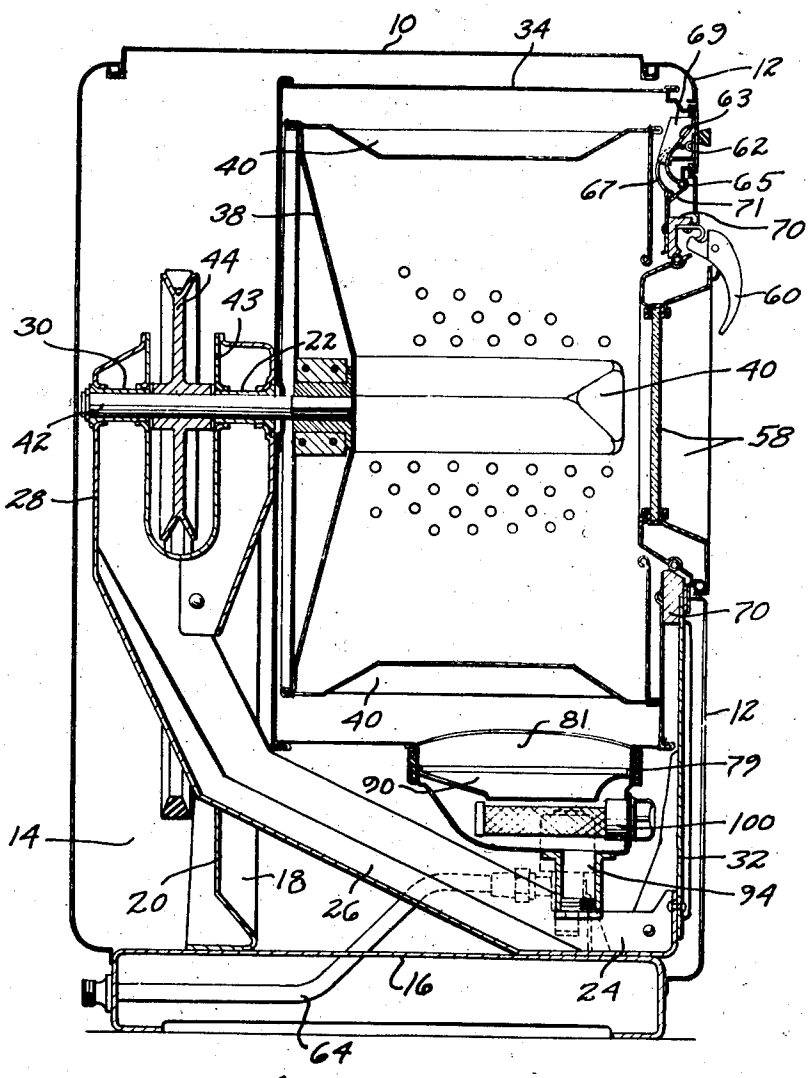


Fig. 1

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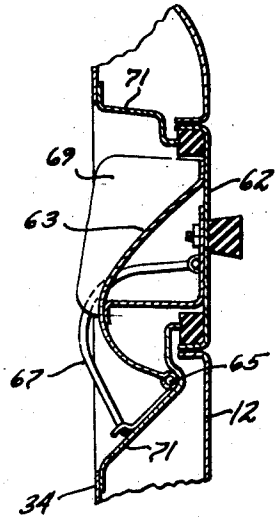


Fig. 2

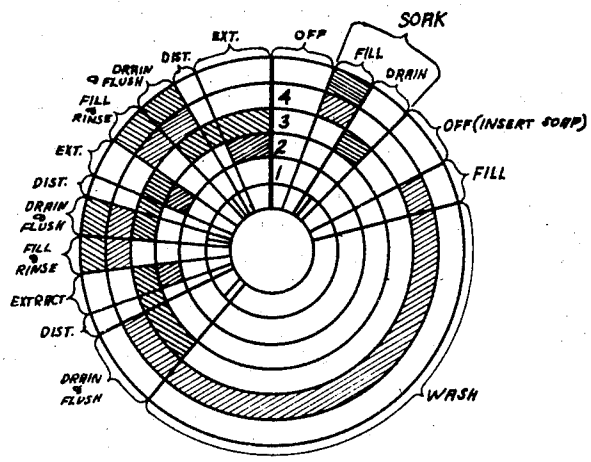


Fig. 3

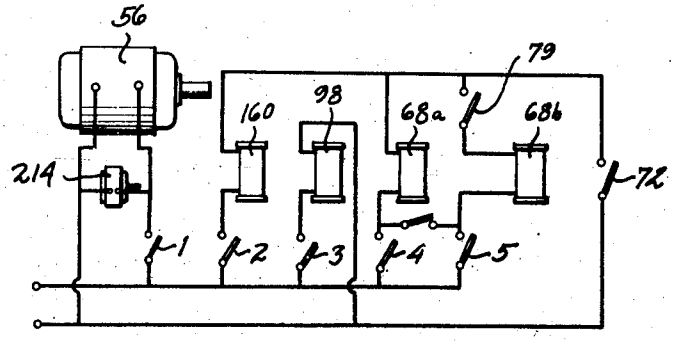


Fig. 4

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UNITED STATES PATENT OFFICE

2,267,785

CLEANING MACHINE

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Original application March 6, 1937, Serial No. 129,429. Divided and this application September 26, 1938, Serial No. 231,653

1 Claim. (Cl. 68—17)

This invention relates to the washing and cleaning of clothes and similar materials, and is described below in connection with an automatically controlled machine for washing and rinsing and drying clothes. Because of variations in hardness and other qualities of the water, it is not possible to set up standards as to the quantity of soap or other detergent required for washing machines used in different localities. At the same time it is very important, in securing maximum efficiency, that approximately the correct quantity be used. Commercial laundries can afford to make careful analyses and extensive tests, but in operating domestic washing machines the quantity of detergent required has heretofore been left to guesswork.

An object of the present invention is to so construct and arrange a domestic washing machine that the addition of detergent may be made under close observation while the machine is in operation, whereby the quantity added may be gaged accurately by direct observation of the suds formed. The machine is constructed with a glazed window through which its operation may be watched, and with means above the water level for introducing the detergent while the machine is running and contains a full load of clothes and wash water.

Preferably the window is mounted in the door through which the work is introduced into the machine; in the arrangement illustrated the clothes are washed in an open-ended horizontal cylinder and the window forms part of a vertical door substantially closing the open end of the cylinder. The cylinder is inclosed in a tub containing the wash water, and the described door forms part of the front wall of the tub. The means illustrated for the introduction of detergent comprises a soap door carried by the tub wall above the clothes door.

The above and other objects and features of the invention, including various novel arrangements and desirable constructions, will be apparent from the following description of the washing machine shown in the accompanying drawings, in which:

Figure 1 is a vertical section through an automatic washing-rinsing-drying machine embodying the invention;

Figure 2 is a partial section, the same as the upper righthand portion of Figure 1 but on a larger scale;

Figure 3 is a diagram of the cycle of operations; and

Figure 4 is a wiring diagram.

While the invention is applicable to any machine having a washing operation, it is described below in connection with the automatic washing-rinsing-drying machine described and claimed in our application No. 129,429, filed March 6, 1937, Patent No. 2,165,884, granted July 11, 1939, of which application the present application is a division.

The particular machine illustrated comprises a casing consisting of suitable top and front and side panels 10 and 12 and 14, removably mounted in any desired manner on a base 16. If desired, various combinations of these panels may be made integral with each other, as for example the top panel 10 and one or more of the side panels 14.

As one convenient and rigid mounting for the tub and rotor parts described below, there may be secured to the rear of the base 16 a triangular bracket 18 having its peripheral portion of channel section to provide stiffness and strength, and provided with a central plate portion or web 20, and which carries a shaft bearing 22 at its apex. The base 16 also has secured to its forward portion one end of a second bracket 24 which has an inclined portion 26 leading to and through, and if desired rigidly secured to, the plate 20 and which then extends upwardly at 28 to support a second shaft bearing 30 spaced rearwardly from and alined with the bearing 22. A vertical third bracket 32 is shown mounted at the front of the base.

A cylindrical horizontal metal tub 34, covered with suitable heat and sound insulating material, is rigidly mounted between the brackets 18 and 32. Within the tub 34 is a rotatable perforated generally cylindrical drum or clothes container 38, formed with several baffles or inwardly-projecting ribs 40. The head of the drum 38 is radially ribbed or otherwise formed to stiffen it, and is secured to a head or spider formed or keyed or otherwise secured on one end of a shaft 42 journaled in the bearings 22 and 30. A U-section stamping 43 may be welded to the upper ends of the two shaft-supporting brackets, to tie them together and to hold the bearings 22 and 30.

Between the bearings 22 and 30 the shaft 42 is provided with a pulley 44 for a V-belt passing over an idler pulley adjustably mounted in a slot in the plate portion 20 of the first bracket, and over a drive pulley on the driven shaft of a two-speed transmission rigidly connected to and driven by a main motor 56 (Fig. 4), all as fully described in our above-identified patent.

The tub 34 has pivoted thereto a clothes door

58 having a latch 60, and which swings either down to a horizontal position when open, or upward to closed position, as shown in Figure 2. If means is provided for holding the door in a horizontal position, it forms a convenient support in front of the opening.

The door, in accordance with the present invention, has its central portion made of glass, so that the washing action may readily be observed. According to one important feature of our invention, adjacent and preferably above the door 58 there is mounted a soap door 62, through which soap powder or other detergent can be introduced while the machine is running and full of wash water, thereby permitting the operator to observe the formation of suds through the glazed door 58 and accurately control the amount of soap added.

The door 62 shown in the drawings is mounted on a bowed stamping 63 mounted on a pivot 65 inside the machine, so that it closes flush with the casing, and a bowed spring 67 acts on it in tension with a toggle action to hold it shut or open, according to whether the ends of the spring are in a line on one side or the other of the hinge 65. The door closes against a frame in the form of an annular stamping 71 secured to the tub 34 about the soap door opening therein. The stamping 63 is provided with wings 69, and is so shaped as to form a receptacle for soap powder when the door is horizontal, and to dump the soap powder into the machine when the door is swung shunt to its vertical position.

Water, at the desired temperature, or hot and cold water from suitable supply connections, is introduced into the tub 34 through hose connections 64, under the control of valves operated by solenoids or the like 68*a* and 68*b*, being injected into the tub through a nozzle projecting through the frame 70 of the door 58.

As hereinafter more fully explained, the water level in the tub is determined by including in the circuit of the solenoids 68 a switch 72, at predetermined high and low water levels.

The water is preferably injected at a temperature (e. g. 110° F.) suitable for washing woolens and the like. Instead of putting in hotter water in the first place when cotton materials are to be washed, we may inject the water at the lower (110°) temperature, and then heat it to raise the temperature (e. g. to around 160° F.) during the washing of the clothes. For example, an immersion heater, or an electric resistance heater, shown as a ring 79 surrounding the drain collar 81 at the bottom of the tub, may be provided.

The drain collar 81 communicates, through a baffle 90 which directs the water through a screen or strainer 92, with a sump 94 drained by a suitable drain conduit controlled by a drain valve operated by a solenoid 98 (Fig. 4). A removable cover 100 permits access to the screen 92 for cleaning purposes.

The speed of the container 38 may be changed from low to high, as described in our above-identified parent application, by means controlled by a solenoid 160.

The entire operation of the machine is controlled by a timer switch driven by a switch motor 214, and opening and closing in a predetermined cycle switches or contacts 1, 2, 3, 4, and 5. These contacts control respectively circuits through (1) the motors 56 and 214, (2) the speed-change solenoid 160, (3) the drain valve solenoid 98, and (4) and (5) the hot and cold water connection control solenoids 68*a* and 68*b*. The latter has in series therewith a thermostat 79 affected by the temperature of the water being injected into the machine.

The machine operates according to the cycle set forth diagrammatically in Figure 3, and which is described in detail in our above-identified parent application No. 129,429.

It will be seen that, after loading the machine, the automatic control switch causes the machine to fill with wash water, in order to soak the clothes thoroughly, and then stop. When it is again started, filled now with a load of soaked wet clothes, it fills to a predetermined level with wash water, and then follows automatically through a complete washing-rinsing drying cycle.

It is at the beginning of this cycle, during and immediately following the injection of the wash water, that the operator gradually adds soap powder or other detergent through the door 62, while watching the suds formation through the window 58, until the proper quality of suds is secured.

While one machine has been described in detail, it is not the intention to limit the scope of the invention to that particular machine, or otherwise than by the terms of the appended claim.

We claim:

In a washing machine a door above the water level in the machine operable to permit the addition of soap, said door being formed to act as a soap receptacle when the door is in open position and to dump the soap into the machine when the door is closed.

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