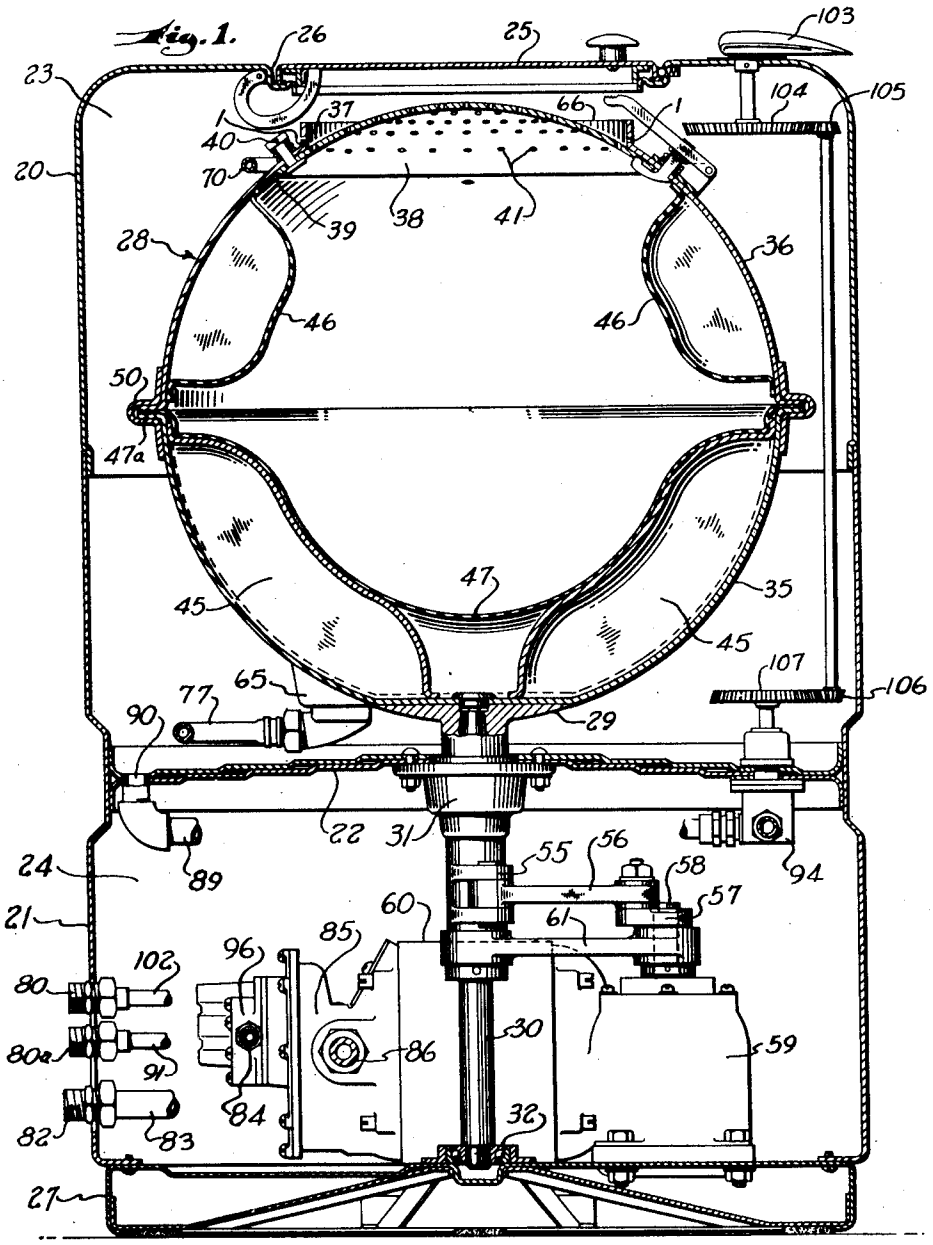
July 17, 1951 J. F. HORVATH 2,561,119

AUTOMATIC LAUNDRY MACHINE OF THE SQUEEZER TYPE

Filed April 11, 1946 3 Sheets-Sheet 1

Fig. 1.



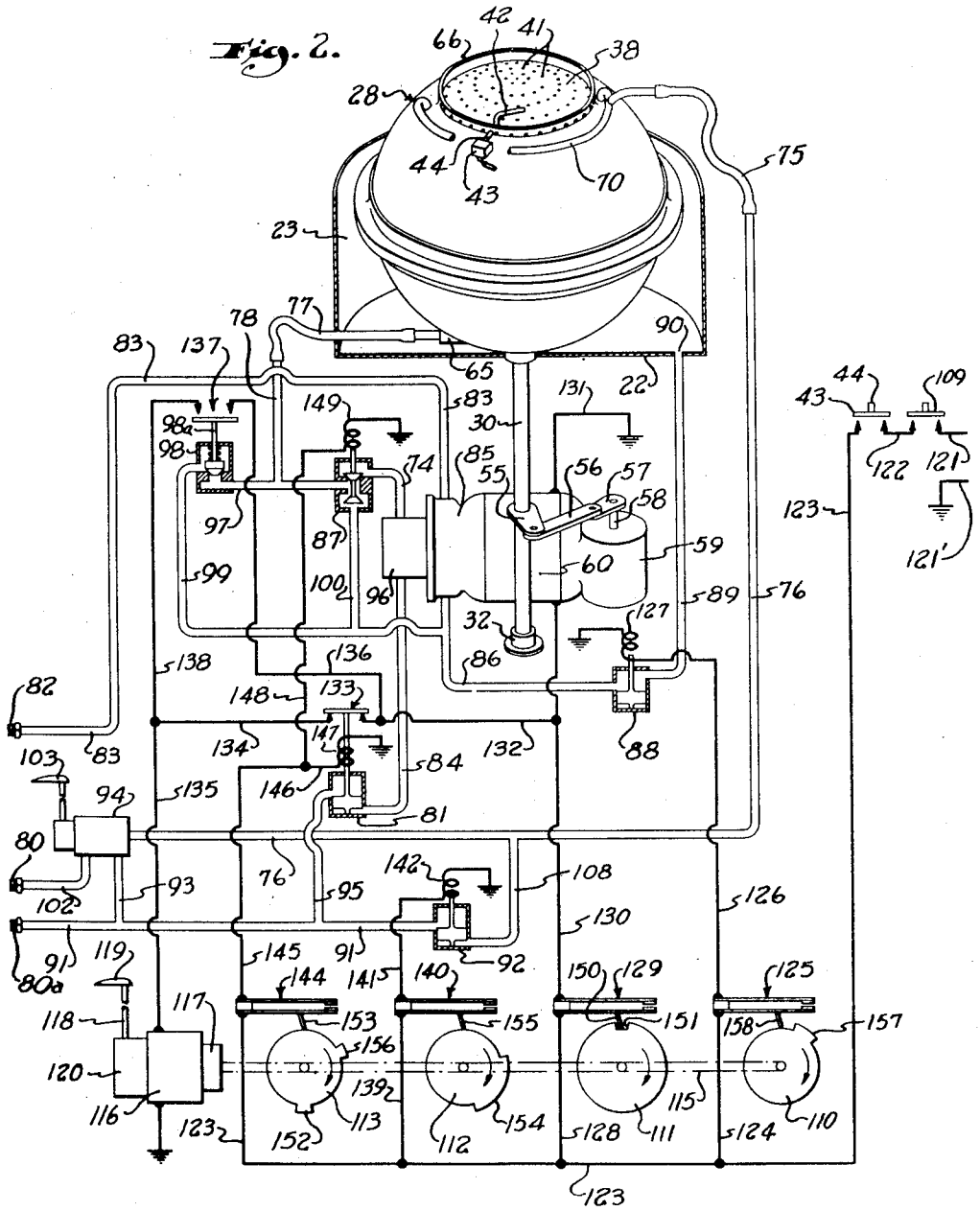
INVENTOR.
John F. Horvath
BY
Christen, Schroeder, Kiernan & Hogan
his ATTORNEYS

July 17, 1951 J. F. HORVATH 2,561,119

AUTOMATIC LAUNDRY MACHINE OF THE SQUEEZER TYPE

Filed April 11, 1946 3 Sheets-Sheet 2

Fig. 2.



INVENTOR.
John F. Horvath

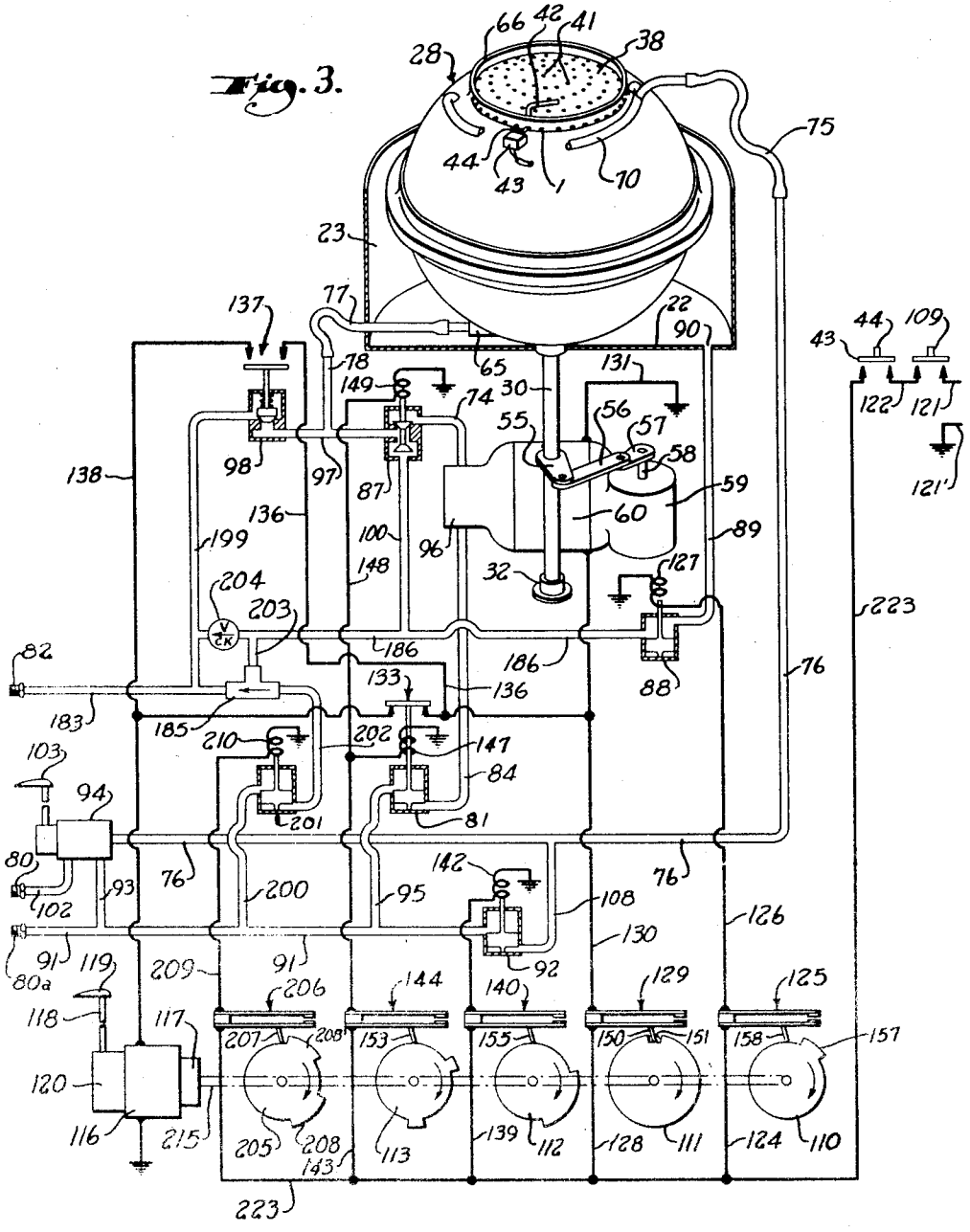
BY
Christian, Sabrosky, Harriman & Hopgood
his ATTORNEYS

July 17, 1951 J. F. HORVATH 2,561,119

AUTOMATIC LAUNDRY MACHINE OF THE SQUEEZER TYPE

Filed April 11, 1946 3 Sheets-Sheet 3

Fig. 3.



INVENTOR.
John F. Horvath

BY
Christon, Schroeder, Merriam & Hopgood
his ATTORNEYS

Patented July 17, 1951 2,561,119

UNITED STATES PATENT OFFICE

2,561,119

AUTOMATIC LAUNDRY MACHINE OF THE SQUEEZER TYPE

John F. Horvath, Milwaukee, Wis., assignor to Appliance Corporation of America, Milwaukee, Wis., a corporation of Wisconsin

Application April 11, 1946, Serial No. 661,225

12 Claims. (Cl. 68—12)

1

The present invention relates to a laundry apparatus, and more particularly to a laundry machine, which will automatically wash, rinse and dry textile materials.

The invention is adapted for use in a laundry machine of the type disclosed in my co-pending application, Serial No. 637,964, filed December 29, 1945, now abandoned, in which the washing and rinsing fluids are extracted or squeezed from the textiles by means of a diaphragm operated by fluid pressure but may be used with automatic washing machines of other types and kinds.

An object of the present invention is to provide an automatic machine in which the washing and rinsing operations are controlled by a timing apparatus which is rendered inoperative during the squeezing operation, and the length of the squeezing or extracting operation is determined by the fluid pressure behind the diaphragm. When the squeezing or extracting operation is governed by a timing apparatus, the amount of water extracted or squeezed from the clothes will vary with the water pressure in the main with which the machine is connected. An object of the invention, therefore, is to provide a machine wherein the pressure for the extraction or squeezeing of cleaning fluid and rinsing fluid from the clothes is uniform.

Another object of the invention is to provide a timing apparatus which operates the various parts of the machine electrically.

Another object of the invention is to provide a novel conduit system for the flow of cleaning and pressure fluids to and from the cleaning fluid container or tub. Another object is to provide a novel conduit system in which an ejector is used to drain the laundry machine.

Another object of the invention is to provide an automatic laundry machine and a timing apparatus therefor which are of simple and inexpensive construction and have a minimum number of moving parts.

Other objects will become readily apparent from the following detailed description taken in connection with the accompanying drawings illustrating a preferred form of the invention, wherein:

Fig. 1 is a vertical sectional view of a laundry machine embodying the invention.

Fig. 2 is a diagrammatic representation of the operative parts of the apparatus showing the hydraulic and electrical circuits and timing mechanism.

Fig. 3 is a view similar to Fig. 2 of an alternate construction.

2

While the invention is susceptible of embodiment in various forms, there is shown in the drawings and herein described in detail a preferred form with the understanding that it is to be considered as an exemplification of the principles of the invention. The scope of the invention will be pointed out in the appended claims.

In the drawings, and particularly in Figs. 1 and 2, the invention is embodied in a household type washing and extracting apparatus or machine comprising a generally cylindrical housing having a top part 20 and a bottom part 21, a partition 22 extending horizontally across the housing to divide it into an upper compartment 23 and a lower compartment 24, a lid 25 for an opening 26 in the top of the upper compartment and a somewhat circular base member 27 secured to the bottom of the housing. A generally spherical container 28 is positioned in the compartment 23 and is supported for oscillation about an upright axis by means of a member 29 secured to the upper end of a drive shaft 30 which is supported in a bearing 31 in the partition 22 and a bearing 32 secured to the base member 27.

The container 28, as illustrated herein, consists of a lower substantially hemispherical part 35 and an upper part 36, provided with an opening 37. A closure or cover 38 for the opening 37 has its peripheral edge 39 located within the part 36 and is movably supported thereon by means of a pivot 40. The cover 38 is perforated by a plurality of apertures 41 and is located immediately below the lid 25 of the housing. The cover may be swung about the pivot 40 to an open position, giving access to the container for the purpose of inserting and withdrawing clothes or other materials when the lid 25 is open. A handle 42 on the cover serves also to close a safety switch 43 by engaging an operating member 44 thereof when the cover is moved to its closed position as will be understood in my copending application referred to above. This switch, as hereinafter more fully described, is in the main control circuit for the driving motor of the apparatus and prevents operation thereof, except when the cover 38 is closed.

Internally the container 28 has a pair of ribs 45 extending inwardly from the lower part 35 and a pair of ribs 46 extending inwardly from the upper part 36. Preferably these ribs are in a common vertical plane and function during a slow oscillatory movement of the container to produce a washing action of liquid on the clothes or other materials placed in the container. A flexible member 47 is arranged normally to fit

against the inner surface of the lower part 35 and snugly over the ribs 45. The flexible member or diaphragm 47 is substantially bowl shaped, may be of rubber or other suitable material, and is provided with an outwardly extending flange 47a which is secured intermediate radially extending flanges on the container parts 35 and 36, respectively. This flange is securely clamped between the flanges by means of an annular clamping ring 50.

In the form of the invention disclosed herein, the container 28 is arranged to be oscillated at a relatively slow speed continuously tthroughout washing, extracting and rinsing operations. To this end the shaft 30 carries a crank 55, the free end of which is connected by means of a link 56 to a crank 57 on a vertical drive shaft 58. The shaft 58 extends from a gear type speed reducer 59 supported on one end of an electric motor 60. Thus, during rotation of the motor continuously in one direction, the crank 57 is rotated by the shaft 58 and during such rotary movement operates through the link 56 to oscillate the shaft 30 and container 28 through an angle of approximately 90°. In order to insure smooth operation, a spacing member 61 is preferably provided between the shafts 30 and 58, the spacing member carrying bearings surrounding each of said shafts and operating to maintain a constant distance therebetween.

During a washing operation the flexible member 47 is in the position illustrated in Fig. 1 and the container is partly filled with water, a detergent and the clothes or other materials to be washed. Upon completion of the washing operation and while the container continues to be oscillated, the flexible member 47 is forced upwardly by admitting water or other liquid under pressure to the space between the bottom of the container and the flexible member. Herein a connection 65 (Fig. 1) is shown for admitting water to the bottom of the container and below the member 47. As the member 47 moves upwardly, the washing liquid is discharged through the apertures 41 in the cover 38 until finally the clothes are pressed against the cover and top part of the container. As the pressure of the liquid in the bottom of the container is increased, the liquid in the clothes is extracted or expressed out of them and forced out through the apertures 41. To insure substantially complete drainage, the upwardly extending lip 66 around the opening 37 is provided with discharge apertures 1.

In order to facilitate filling the container with water or other liquid, an arcuately bent pipe 70 is provided with a plurality of spaced connections with the top part of the container. This pipe is connected to a flexible hose 75 which extends to a supply pipe 76 to which the other end of the hose is connected. This hose connection permits the container to be oscillated with a minimum amount of movement of the hose. Similarly, a hose 77 extends from the connection 65 around the major portion of the housing to a pipe 78. The pipe 76 is arranged to conduct hot water to the hose 75 for washing purposes and cold water for rinsing. The pipe 78 is connected to provide water under pressure to the space beneath the flexible member 47 during an extracting operation and to drain water therefrom upon the completion of an extracting operation.

An external connection 80 is provided for hot water, a connection 80a for cold water and a connection 82 for a drain. The drain connection 82 is connected by a pipe 83 to the discharge port

of a drain pump 85 which is supported on the motor 60 and is suitably driven thereby. The inlet to the drain pump is connected by a pipe 86 to a drain valve 88. A pipe 89 from the pipe 86 leads to a drain opening 90 in the partition 22. Thus, any liquid spilling into the chamber 23 of the housing is continuously pumped out through the pipes 89 and 86 to the pipe 83.

From the cold water connection, water passes through a pipe 91 to a rinse valve 92. A pipe 93 branches from the pipe 91 to a mixing valve 94. A pipe 95 also branches from the pipe 91 and extends to a valve 81 from which a pipe 84 extends to the inlet of a high pressure water pump 96, which is supported on the casing of the drain pump and is also driven continuously by the motor 60. The pipe 78 is connected to a diverting valve 87 which is connected with the outlet of the pump 96 by a pipe 74. A pipe 97 branches from the pipe 78 and leads to a pressure relief valve 98 having a spring pressed plunger 98a. A pipe 99 leads from the valve 98 to the pipe 86 and drain pump 85. A pipe 100 branches from the pipe 99 and leads to the diverting valve 87.

Hot water passes from the connection 80 through a pipe 102 to the mixing valve 94, the mixing valve being provided with a manual control handle 103, which is adjustable to determine the relative amount of hot and cold water issuing from the mixing valve to the pipe 76. The handle, as shown in Fig. 1, operates the valve through gears 104, 105, 106 and 107. The pipe 76 is also connected to the rinsing valve 92 by branch pipe 108.

The casing lid 25 is adapted, when closed, to close a safety switch 109 which, like switch 43, is in the main control circuit for the driving motor and prevents operation thereof when the lid 25 is open.

A control mechanism is provided for governing automatically the operation of the machine after an initial manual starting operation. The automatic control includes a series of cams 110, 111, 112 and 113, all mounted on a single shaft 115, driven by means of a timer motor 116 through a speed reducer unit 117 mounted thereon. A manual means comprising a shaft 118 operated by a handle 119 on the casing is also provided for rotating the shaft 115 through suitable gearing means 120.

Referring particularly to Fig. 2, the electrical circuits consist of supply lines 121 and 121' connected to a suitable source of power. Line 121' is grounded and line 121 leads to the outer door switch 109 which in turn is connected by a wire 122 to the container door switch 43 which is connected by a wire 123 to the various switches operated by the cams 110 to 113 inclusive. A wire 124 connects wire 123 to one side of a switch 125 operated by the tub drain valve cam 110. The other side of this switch is connected by a wire 126 to one terminal of a solenoid 127 (operating drain valve 88) the other terminal of which is grounded. The wire 123 is also connected by a wire 128 to a switch 129 operated by the motor cam 111. The switch 129 is connected by a wire 130 to one terminal of the motor 60, the other terminal of which is connected to ground by a wire 131. The motor supply wire 130 is connected to the timer motor by a primary and secondary circuit. A wire 132 leads from wire 130 to one contact of a switch 133 (operated by the pressure pump supply valve cam 113) and wires 134 and 135 connect the other contact of the switch to one terminal of the timer motor, the

other terminal of which is connected to ground. This is the primary circuit. The secondary circiut leads from wire 132 by wire 136 to one contact of a switch 137 on the pressure relief valve plunger 98a, the other contact of which is connected by a wire 138 to the wire 135 leading to the timer motor.

Wire 123 connects with a wire 139 which leads to one contact of a swtich 140 (operated by the rinse valve cam 112) the other contact of which is connected by a wire 141 to one terminal of a solenoid 142 on the rinse valve, the other terminal of the solenoid being grounded. Wire 123 also is connected to one contact of a switch 144 (operated by the pressure pump supply valve and diverting valve cam 113) the other contact of which is connected by wires 145 and 146 to one terminal of a solenoid 147 (of the pressure pump supply valve 81) the other terminal of which is connected to ground. Wire 145 is also connected to a wire 148 which leads to one terminal of a solenoid 149 on the diverting valve 87, the other terminal of which is connected to ground.

In operation, the container 28 is filled with clothes and other materials to be washed and the handle 103 is turned to operate the mixing valve 94 to supply the container with the desired amount of hot water. Thereupon, soap or other detergent is added, and the container door 38 and the casing door 25 are closed. At this time, the cams are in the positions shown in Fig. 2 of the drawing, the switches 125, 129, 140 and 144 all being open. The operator thereupon turns the manual control handle 119 so as to rotate the shaft 115 and the cams 110 to 113 inclusive in a clockwise direction and the cam follower 150 on the motor cam switch 129 is forced out of the depression 151 in the cam 111 which closes the switch and energizes the main motor 60 and the timer motor 116, the latter motor being connected through its primary circuit to the motor supply wire 130.

The machine is now in the washing portion of its cycle and oscillates the material in the container to wash the clothes. The container, however, oscillates and the two pumps are driven, during the entire cycle of operations. The timer motor rotates the shaft 115 for a predetermined time until the clothes are thoroughly washed, whereupon the projection 152 on the cam 113 engages the follower 153 on the switch 144 and close the switch to start the first extraction period of the cycle. This energizes the solenoid 147 to raise the plunger in the pressure pump supply valve 81 to direct a supply of water to the pressure pump 96 and at the same time opens the switch 133 on this valve whereby to break the primary circuit to the timer motor. The solenoid 149 on the diverting valve is simultaneously energized and the valve connects pipes 74 and 78 to permit the pressure pump to force water into the container underneath the diaphragm. The diaphragm is forced upwardly by this water pressure, flowing the water off the top of the clothes and then forcing the clothes against the container cover 38 and squeezing or extracting the cleaning fluid out of the clothes. The fluid flows into the compartment 23 in the upper part of the casing and through the drain opening 90, pipes 89 and 86 to the drain pump which pumps it through pipe 83 to the drain.

After the pressure under the diaphragm has reached a predetermined amount, such as 150 pounds, the piston 98a in the pressure valve 98 is raised and some of the water from the pressure pump is routed to drain through the pipe 99, thus slowing up the raising of the piston and maintaining the pressure in the container at substantially the maximum desired pressure for a short period. When fully extended, the piston 98a closes the switch 137 in the timer motor secondary circuit, starting the timer motor which rotates cam 113 until projection 152 passes the cam follower 153, thereby de-energizing solenoids 147 and 149 so as to shut off the supply of water to the pressure pump and the lower part of the container and return the diverting valve to the position shown in the drawings, whereby to drain the container through pipes 78 and 100. The primary circuit to the timer motor is then closed by the lowering of switch 133 and this circuit is thus re-established, the secondary circuit being opened shortly thereafter by the lowering of the switch 137 and piston 98a due to the decrease in pressure against the pressure relief valve 98.

Next in the cycle of operations the rinse valve cam 112 is rotated sufficiently so that the projection 154 on this cam strikes against and raises the follower 155 on the switch 140 to close the switch and energize the solenoid 142 to open the rinse valve 92, permitting the flow of cold water to the upper part of the container. The rinse operation continues for a predetermined time determined by the arcuate length of cam projection 154, during which rinse water is continually supplied to the container to give a novel rinsing action. The rinse water is discharged into the upper portion of the container and over the clothes in substantially large volume and aids in returning the flexible member 47 to its normal position. Here again, the oscillating motion of the container continues, with the result that the clothes are agitated in the rinse water. To effect a highly improved rinsing of the clothes and at the same time permit the use of cold water therefor, the rinse water continues to flow into the container until the entire container is filled and thereafter keeps on flowing into the container during the agitated rinsing operation while surplus rinse water overflows through the apertures 41 in the cover 38 and carries away additional foreign matter principally soap which remained in the clothes after the extracting operation. As a result, substantially all of the soap is removed from the clothes and carried away with the overflow rinse water before the extracting operation commences.

At the end of the rinsing action, the projection 156 on the cam 113 closes the switch 144 and the extraction operation described above is repeated. A short time before the second extraction or squeezing period is terminated, cam 110 has rotated sufficiently so that the projection 157 on it raises the cam follower 158 on the switch 125 to close the switch and thereby energize the solenoid 127 and close the drain valve 88. This eliminates the possibility of the drain pump drawing air from the tub rather than extracting water from below the diaphragm. At the end of the second extraction period, the projection 157 passes the cam follower 158 to open the drain valve 88 (the part of the container underneath the diaphragm now being completely emptied) and completely drains out the water extracted from the container into the container compartment 23. Thereupon, the cam follower 150 in the switch 129 to the motor falls into the depression 151 in the cam 111, opening the switch 129 and stopping the motors.

While the container oscillates at exactly the

same speed, about 72 oscillations per minute, during both the washing and rinsing operations, nevertheless the action of the fluid on the material being treated is quite different during the two operations. This results from the difference in the amount of fluid in the container during these operations. For the washing operation less than sufficient water to float the material freely should be introduced into the container. Approximately one gallon of washing fluid to each pound of dry material has been found to be satisfactory for this purpose, the material being rather loosely massed in this proportion of cleaning fluid. When the container oscillates with this load of washing fluid and material, a violent action occurs in the container; the material and fluid at the end of each oscillation strike the ribs and are tossed upwardly in the container. This causes considerable rubbing or flexing of the mass of material against the ribs and when the material drops down against the wall of the container, hence all the material is given a washing action each time the mass strikes the ribs. The material, however, is not wadded together so as to become entangled and, inasmuch as the material is forced upwardly and then falls downwardly, a different portion of the mass will strike the ribs at the end of the next oscillation.

When, however, the rinsing action commences, the rinse water completely fills the tub and causes the material to float loosely in the water. As a result, there is very little rubbing action, but the soapy water is floated out of the material by the agitation of the water, forming a scum on the top of the water which flows out through the opening in the top of the container. Moreover, the water and material are circulated sufficiently in the container so that different pieces of the material gradually move from the top to the bottom of the container and back again. As a result, no scum or soap suds will be caught or trapped underneath any of the material and all of this soap will flow out of the container by the time the rinsing period is concluded and none will be deposited on the material. In the particular construtcion here shown, it is impossible to operate the machine when either the cotainer door or the casing door is open. The operator may at any time during the operation of the machine open the doors to stop the operation of the machine if it is desired to add clothes, soap or water. It is also possible by means of the manual control handle 119 to cut down the length of any operation. The handle 119 is mounted for effecting movement of the cam shaft 115 in only a forward direction, for example by ratchet means as shown in my said copending application 637,964, now abandoned..

The alternate construction shown in Fig. 3 is the same as that shown in Figs. 1 and 2 except that the drain pump is omitted and in its place is an ejector 185 in the drain pipe 183. This ejector communicates with the cold water supply line 91 by pipe 200 from the pipe 91 to an ejector supply valve 201 and by pipe 202 which connects this valve and the ejector. A pipe 199 leads from the pressure relief valve 98 to the drain pipe 183 and a pipe 186 leads from the drain valve 88 to the pipe 199 and then to the drain pipe. A branch pipe 203 connects the pipe 186 to the ejector 185, and a check valve 204 is placed in the pipe 186 between the pipes 203 and 199.

The timer motor rotates a shaft 215 on which are the cams 110 to 113 inclusive and a cam 205 adapted to control the ejector supply valve.

The electric circuit includes a wire 223 from the sphere door switch 43 to the wires 124, 128, 139 and 143 leading to the switches 125, 129, 140 and 144, as well as to one contact of a switch 206 having a follower 207 which is adapted to close the circuit to the ejector supply valve when the projections 208 and 208' on cam 205 raise the cam follower 207 to close switch 206. A wire 209 leads from the other contact of switch 206 to one terminal of a solenoid 210 controlling the ejector supply valve, the other terminal of which is connected to ground.

This alternate construction operates in the same manner as the construction shown in Fig. 2 so far as the cams 110 to 113 inclusive and the parts controlled thereby are concerned. During the washing and rinsing actions, any overflow from the container 26 will flow through the drain 98 and pipes 89, 186, and 199 to the drain pipe 183 by gravity. A short time after the pressure pump commences to flow water into the lower part of the container, the ejector supply valve is opened by reason of the cam section 208 raising the cam follower 207 and energizing the solenoid 210. This causes the ejector to divert the flow of water from pipe 186 to it through the pipe 203 and results in complete and rapid draining of the casing compartment 23. After the pressure relief valve 98 commences to operate, water will flow from it by gravity through the pipe 199 through the drain pipe 183, the check valve 204 preventing the water from entering the pipe 186. Shortly after the pressure relief valve 98 operates for the second extraction, the tub drain valve cam 110 will cause the solenoid 127 to be energized to close the tub drain valve 88 and the ejector will drain the water from underneath the diaphragm through the hose 77, pipe 78, diverting valve 87 and pipes 100, 186 and 203 to completely drain the lower part of the container. The drain valve will then be opened by reason of the opening of the circuit to the solenoid 127 upon the projection 157 of the cam 110 passing the follower 158 on the switch 125. The ejector will thereupon completely drain the compartment 23 and shortly thereafter the motors will be de-energized by reason of the cam follower 150 on the switch 129 following into the depression 151 in the cam 111 to open the motor switch.

I claim:

1. Mechanism for controlling the cycle of operations in an automatic washing, rinsing and extracting machine, comprising a time controlled means for controlling the washing and rinsing operations, pressure controlled means for controlling the duration of the extracting operation, and means for making said first means inoperative while said second means is operative and for making said first means operative after each extracting operation.

2. Mechanism for controlling the cycle of operations in a power driven, automatic laundry machine having a washing and rinsing container with an extracting means therein, comprising means for controlling the time of the washing and rinsing operations and for shutting off the power, pressure controlled means for controlling the duration of the extracting operation, and means making each of said control means inoperative while the other is in operation.

3. Mechanism for controlling the cycle of operations in a power driven, automatic laundry machine having a washing and rinsing container with extracting means therein, compris-

ing a timer for controlling the duration of the washing and rinsing operations and for shutting off the power, means for making said timer inoperative at the end of the washing and rinsing operations, a pressure valve for controlling the duration of the extracting operation, and means actuated by said valve for making said timer operative at the end of the extracting operations.

4. Mechanism of the kind claimed in claim 3 including a separate motor for operating the timer, said means for making the timer inoperative including means for initiating the extraction operation.

5. A laundry machine comprising a container, adapted to receive material to be cleaned, means for directing washing fluid and rinsing fluid to said container, means for washing and rinsing the material in said container, means in said container for extracting the washing fluid and rinsing fluid therefrom and from said material, pump means for directing a pressure fluid to said container and against said extracting means to effect said extracting operation, a valve controlling the rinsing fluid supply, a valve controlling the supply of fluid to said pump, pressure controlled means for closing said last mentioned valve to cut off the supply of said pressure fluid and for draining the fluid from the container after a predetermined pressure has been reached therein, a timer for operating said valves, means for making said timer inoperative after said pressure pump supply valve is open, and means for making said timer operative after said pressure controlled means has been operated.

6. A laundry machine for washing, rinsing and extracting cleaning liquid from textiles being cleaned, comprising a container, means for introducing washing and rinsing liquids into the container, a flexible member for dividing the container into a washing compartment and a compression compartment, a time controlled means for controlling the washing and rinsing operations, a pump for forcing liquid under pressure into said compression compartment, a valve for controlling admission of liquid to said pump, a pressure relief valve for limiting the pressure in the compression compartment to a predetermined amount, a motor for operating said time controlled means, means operated by the time controlled means for opening said pump valve and at the same time stopping said motor, and means operated by said pressure relief valve for starting said motor upon completion of the extracting operation.

7. A washing and extracting machine having in combination a clothes container having agitating means in the lower portion thereof and a liquid discharge opening in the top thereof, mean for supporting said container for oscillation about an upright axis, means for oscillating said container continuously at the same speed during washing, extracting, rinsing and extracting operations in the order named, means for supplying washing liquid to the container, means for discharging liquid from the container and for extracting under pressure ilquid from the clothes through said opening, means for supplying cold rinsing liquid to the container upon completion of the wash-liquid-extracting operation and in a quantity sufficient to cause an overflow through said opening while the materials are agitated by the oscillating movement of the container and to carry away foreign matter from said materials, control means for effecting sequential operation of the machine to obtain a cycle comprising washing, extracting, rinsing and extracting in the order named and to stop the machine after the completion of the second extracting operation, said control means comprising a time controlled member for controlling the washing and rinsing and to stop the machine, and a pressure controlled member for controlling the extracting pressure, and means connected with the extracting means for stopping the control means during the extracting operations.

8. A washing and extracting machine having in combination a clothes container adapted to contain clothes and a cleaning liquid and to agitate the clothes and liquid to perform a washing operation when the container is actuated and having a liquid discharge opening in the top thereof, means for supporting said container, means for actuating said container continuously during washing, extracting, rinsing and extracting operations in the order named, means for supplying washing liquid to the container, means for discharging liquid from the container and for extracting under pressure liquid from the clothes through said top opening, means for supplying cold rinsing liquid to the container upon completion of the wash-liquid-extracting operation and in a quantity sufficient to cause an overflow through said opening while the clothes are agitated in the liquid by the movement of the container and to carry away foreign matter from said materials, control means for effecting sequential operation of the machine to obtain a cycle comprising washing, extracting, rinsing and extracting in the order named, said control means including a time controlled member for controlling the washing and rinsing and to stop the machine, a pressure controlled member for controlling the extracting pressure, and means for making each of said members inoperative while the other is in operation.

9. An automatic washing and extracting machine having in combination a container for textile materials and liquid having agitating means therein and a liquid discharge opening adjacent the top thereof, means for supporting said container for oscillation, means for oscillating said container continuously at the same speed during a period in which washing, extracting, rinsing and extracting operations are performed on the materials in the order named, means for supplying washing liquid to the container, means for discharging liquid from the container and extracting liquid from the materials through said top opening, means for supplying rinsing liquid to the container upon completion of the wash-liquid-extracting operation and in a quantity sufficient to cause an overflow through said opening while the materials are agitated by the oscillating movement of the container and to carry away foreign matter from said materials, control means for effecting automatic sequential operation of the machine to obtain a cycle comprising washing, extracting, rinsing, and extracting in the order named, said control means comprising a timer for controlling the washing and rinsing and to stop the machine, means for making said timer inoperative at the end of the washing and rinsing operations, a pressure controlled means for controlling the duration of the extracting operations, and means for making each of said timer and pressure means inoperative while the other is in operation.

10. A washing and extracting machine having

in combination a clothes container adapted to contain clothes and a cleaning liquid, means for actuating said container during washing, extracting, rinsing and extracting operations in the order named, means in the container for extracting washing liquid and rinsing liquid therefrom and from the clothes being cleaned, a time controlled means for controlling the washing and rinsing operations, means operated by the time controlled means for initiating the extracting operation and at the same time stopping operation of the time controlled means, and means operated by a predetermined pressure on the extracting means for starting operation of the time controlled means upon completion of the extracting operation.

11. A laundry machine for washing, rinsing and extracting cleaning liquid from textiles being cleaned, comprising a container, means for introducing washing and rinsing liquids into the container, a flexible member for dividing the container into a washing compartment and a compression compartment, a time controlled means for controlling the washing and rinsing operations, means operated by the time controlled means for initiating the introduction of liquid under pressure into the compression compartment to force the flexible member against said textiles and the wall of said container and at the same time stopping operation of the time controlled means, and means which after the pressure in the compression chamber has built up to a predetermined amount will again start into operation the time controlled means.

12. Mechanism for controlling the cycle of operations in a power driven, automatic laundry machine having a washing and rinsing container with extracting means therein, comprising a timer for controlling the duration of the washing and rinsing operations and for shutting off the power, means for making said timer inoperative at the end of the washing and rinsing operations, a pressure valve for controlling the duration of the extracting operation, the timer being electrically connected to the parts it controls, and a spring-opened switch for making said timer operative at the end of the extracting operations, said switch being closed by said valve when said valve is opened.

JOHN F. HORVATH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,547,266	Robe	July 28, 1925
1,828,908	Perkins et al.	Oct. 27, 1931
1,849,283	Crane	Mar. 15, 1932
1,849,896	Weiman	Mar. 15, 1932
2,156,541	Misenhimer et al.	May 2, 1939
2,187,770	Chamberlin et al.	Jan. 23, 1940
2,197,294	Brockbank	Apr. 16, 1940
2,265,516	Chayie	Dec. 9, 1941
2,288,141	Oliver	June 30, 1942
2,407,660	Graham	Sept. 17, 1946