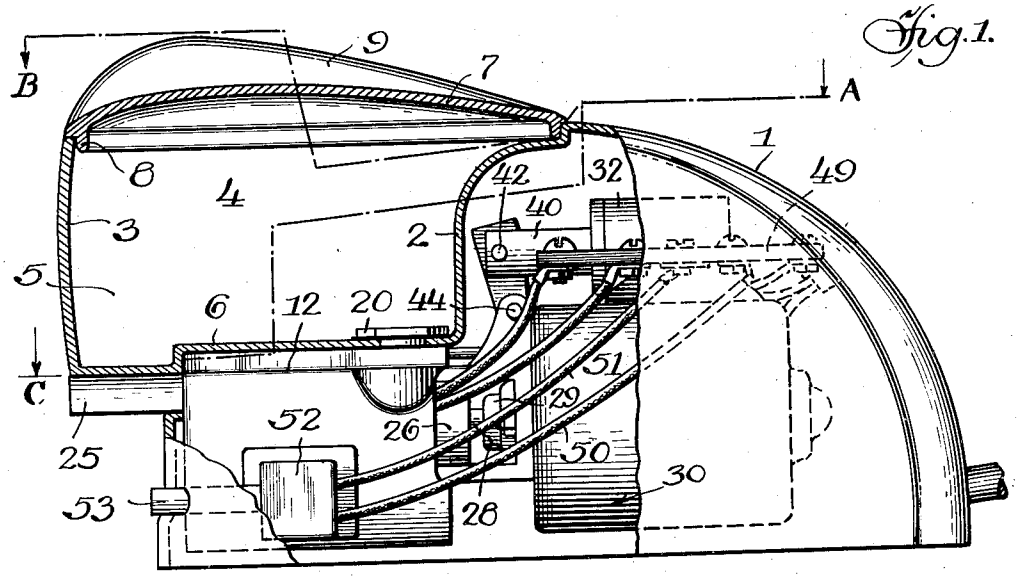
Jan. 24, 1950 A. B. CAMPBELL 2,495,441

LATHER PRODUCING MACHINE

Filed June 5, 1946 2 Sheets-Sheet 1

Fig. 1.



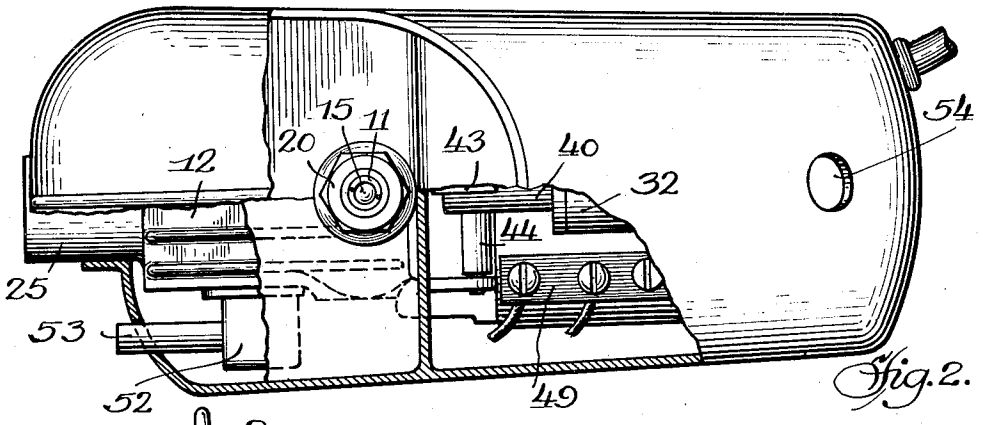


Fig. 2.

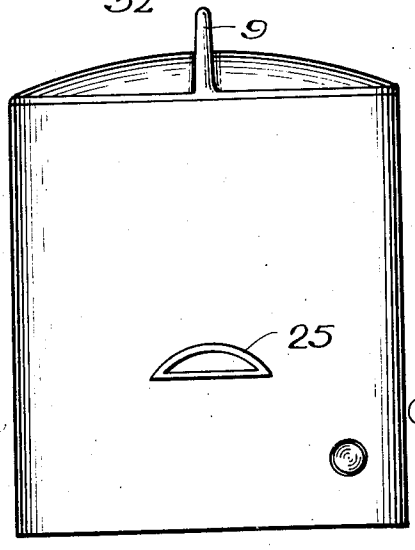
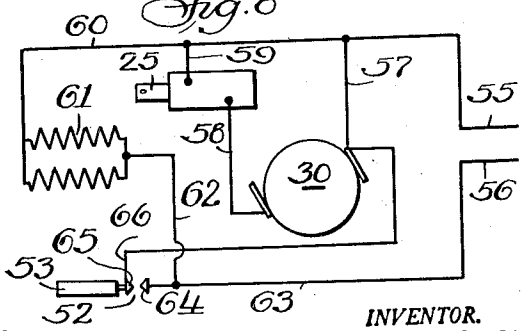


Fig. 3.

Fig. 6



INVENTOR.
Albert B. Campbell
BY
Chritton, Schroeder, Merriam & Hofgren
Attys

Jan. 24, 1950 A. B. CAMPBELL 2,495,441

LATHER PRODUCING MACHINE

Filed June 5, 1946 2 Sheets-Sheet 2

Fig. 4.

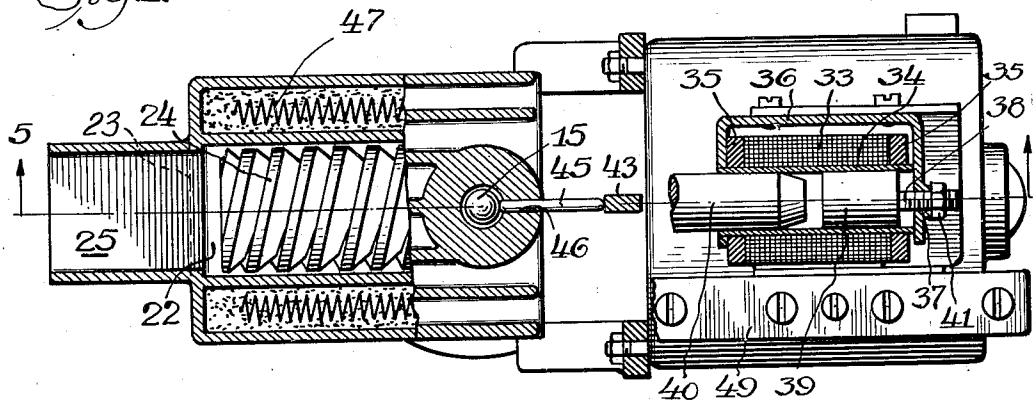


Fig. 5

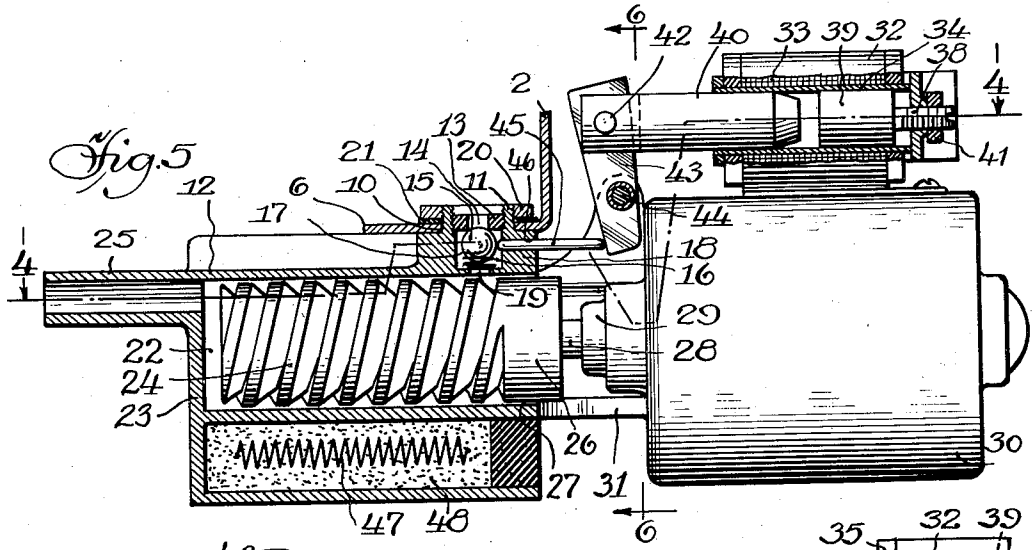
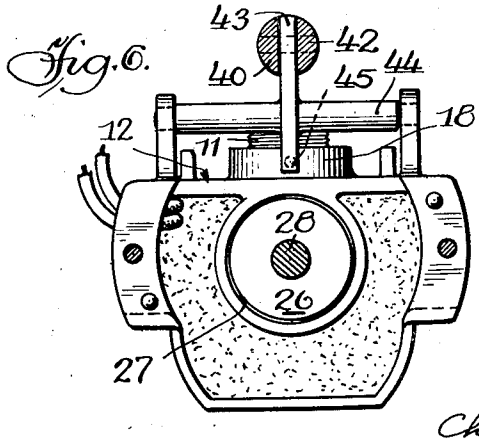


Fig. 6.



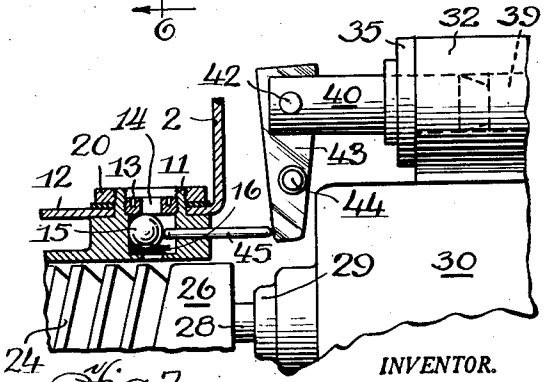


Fig. 7

INVENTOR.
Albert B. Campbell
BY
Christon, Schroeder, Merriam & Hofgren.
Attys

Patented Jan. 24, 1950 2,495,441

UNITED STATES PATENT OFFICE

2,495,441

LATHER PRODUCING MACHINE

Albert B. Campbell, Chicago, Ill., assignor to Campbell Products Co., a corporation of Illinois

Application June 5, 1946, Serial No. 674,464

9 Claims. (Cl. 259—10)

1

This invention relates to a lather producing machine having means for producing lather from liquid soap, and is especially adapted for the production of lather for use in barber shops and other places where soap lather is frequently desired in greater or less quantities.

The machine of the present invention is an improvement over those disclosed in my prior Patents 2,191,450, granted February 27, 1940, and 2,323,377, granted July 6, 1943, both for "Lather producing machines."

Among the objects of the present invention are: to provide a novel and improved lather producing machine; to provide a machine of the type referred to which, when once started, is fully automatic in operation; to provide such machine requiring the use of only one hand to start, collect the extruded lather, and stop; to provide between the liquid soap receptacle and the lathering means a valve that is automatically operated by an electrical control; to provide a valve adjusting means which when once adjusted remains so adjusted; to provide a lather producing machine having a larger soap capacity; to provide a machine as described, which is of simple construction, is easy, efficient and automatic in operation, is streamlined and pleasing in appearance, and is durable, reliable and instantly available; and such further objects, advantages and capabilities, inherently possessed by my invention, as will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein a preferred embodiment, I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

In the drawings:

Figure 1 is a side elevation, partly in section, of a lather producing machine embodying my invention.

Figure 2 is a top plan view of Figure 1, showing a portion of the machine in transverse section, the upper portion of Figure 2 being a section on the line A—B of Figure 1, and the lower half of Figure 2 being a section on the line A—C of Figure 1.

Figure 3 is an end elevation looking toward the left-hand side of Figure 1.

Figure 4 is a horizontal longitudinal section on the line 4—4 of Figure 5.

Figure 5 is a longitudinal vertical section on the line 5—5 of Figure 4 and showing the motor in elevation.

2

Figure 6 is a vertical transverse section on the line 6—6 of Figure 5.

Figure 7 is a fragmentary longitudinal vertical section on a portion of the line 5—5 of Figure 4 with the solenoid and motor being shown in elevation and the solenoid core in position for opening the valve.

Figure 8 is a diagrammatic view showing the electric circuit of my device.

In the form shown in the drawings, my invention comprises a housing 1 for enclosing the motor, the solenoid and associated parts, this housing, as shown in the left-hand half of Figure 1, having downwardly extending walls 2, 3 and side walls 4 forming a liquid soap-receiving receptacle 5. This receptacle is provided with a bottom 6 and a removable cover 7 formed with marginal flanges 8 for seating within complemental flanges in the upper portion of the housing 1. A cover 7 is provided with a centrally upstanding rib 9 to enable removal and replacement of the cover. The bottom wall 6 of the liquid receptacle is formed with an opening 10 through which extends upwardly a threaded circular flange 11 of the lathering chamber 12. Screw threaded into the flange 11 is a threaded washer 13 having a central opening 14 forming a port upon which is normally seated the ball valve 15, the latter being urged against the port by a coil spring 16 seated between the bottom face of the ball and the upper face of the bottom wall of the cavity 17, within which the ball is movably mounted. Cavity 17 is formed in the upstanding neck 18 on the upper side of the lathering chamber wall 12, this neck at the bottom of the cavity 17 having an opening 19 in alinement with the opening 14 of the port.

After the spring 16 and ball 15 have been positioned within the cavity 17 and the washer 13 screwed in place, an annular nut 20 is screwed downwardly upon the exterior threads of the circular flange 11 so as tightly to clamp a gasket 21 between the bottom face of nut 20 and the upper face of the bottom wall 6 of the liquid receptacle. This securely fastens the lathering chamber member to the lower face of the liquid receptacle. As seen in Figure 5 the lathering chamber comprises an elongated cylindrical opening 22 closed at its outer end by the wall 23, and open at its opposite end prior to introduction thereinto of the lathering screw 24. Extending forwardly from the end wall 23 is a nozzle 25 through which lather is extruded from the lathering chamber space 22 to the outside to be

received in the operator's hand, as later more fully explained.

Rotatably mounted in the lathering chamber space 22 is the screw 24 which, at its right-hand end as viewed in Figure 5, is formed with a cylindrical portion 26, the exterior circumference of which, together with the exterior circumference of the threads of the screw, are of slightly less diameter than the diameter of the cylindrical space 22 in the lathering chamber. This space between cylinder 26 and the exterior of screw threads 24, and the cylinder wall, is sufficient to permit atmospheric air to be sucked in through the annular space 27 and passed along the similar space around the exterior of the screw threads. This space is so predetermined that air may be sucked into the lathering chamber by the screw and yet prevent the liquid soap entering the lathering chamber from escaping rearwardly around the cylindrical portion of the screw. The amount of said space may be governed, if desired, by the viscosity of the liquid soap. As will be seen from Figure 5, the inclination of the screw threads 24 is such as to force the lathering material to the left, as viewed in Figure 5, and ultimately out through the opening in nozzle 25.

The screw member 24 is rigidly fixed to a rearwardly extending shaft 28 which rotatably protrudes through the integral portion 29 of the motor casing 30. As will be understood, shaft 28 is concentric with the rotating portion of the motor within the motor casing 30. The motor being of conventional form, it will not be described in detail except to point out that it will rotate at such speed as to give the desired rate of rotation to the lathering screw 24. The motor casing 30 is rigidly mounted to the lathering chamber member by integral or other suitable walls 31. The motor casing is also suitably and rigidly mounted within the housing 1.

Fixedly mounted upon the upper face of the motor housing 30 is a solenoid 32 having the winding 33, which winding is suitably connected to electrical conductors, as later more fully described. These solenoid windings are mounted upon the tubular metal member 34 and between the annular end pieces 35, which latter are fixed adjacent the ends of tube 34. Surrounding tube 34 and the end pieces and winding is a frame member 36 which, at its right-hand end, as viewed in Figure 4, is formed with a threaded aperture 37, within which is rotatably mounted the adjusting screw 38 having fixed at its inner end the adjusting head 39 for adjustably serving as a stop for the core or plunger 40 of the solenoid. In order to adjust the stop member 39 longitudinally within the solenoid tube 34, I have provided a lock nut 41 which, when the threaded member 38 is rotated a desired amount to position the adjustable member 39 where desired, may be locked against the outer face of the adjacent end of the frame 36. Any suitable means may be used for rotating threaded rod 38 in the desired direction.

Referring to Figure 5 it will be seen that the solenoid plunger 40, at its lefthand end as viewed in Figure 5, is fulcrumed by a pin 42 to the lever 43 fulcrumed by pin 44 to the motor frame. The lower end of lever 43 extends a suitable distance below the fulcrum pin 44 to contact the adjacent end of the longitudinally slidable rod 45. This rod is slidably mounted in an opening 46 formed in the neck 18, so that the inner end of rod 45 will contact the adjacent face of the valve ball 15 to push the ball laterally and slightly downwardly with relation to the port to open the same a distance depending upon the movement of the solenoid plunger 40. When the rod 45 is freed from pressure by the lower end of lever 43, the ball will be returned to its seat against the port by the spring 16. Movement of the ball sideways to open the port will permit the desired limited amount of liquid soap to enter the lathering chamber 22.

Mounted to extend partially around the sides and bottom of the lathering chamber is an electric heater 47 which is embedded in an insulating material 48 such as porcelain or other suitable insulating material, and the elements of which heater will be heated when the plug is inserted into a wall socket or the like connected to a source of electric current. The conductors for the motor, solenoid and the heater are attached to suitable terminals carried by the supporting element 49. The conducting elements to the motor and solenoid are passed through cables 50 and 51 and connected with a switch located in the switch box 52, this switch being normally moved to open position by suitable spring action when the push rod 53, or other suitable switch controlling element, is released by the hand of the operator when adjacent the nozzle 25. This enables the motor and solenoid to be energized only when the push element 53 of the switch is depressed, the motor and solenoid being deenergized when the operator removes his hand or fingers from the spring-pressed push element 53. The cable containing the electric wires will pass to the interior of the housing through an opening 54 and the wires of which will diverge and be connected to their appropriate terminals for operation of the machine under control of the push button 53.

Figure 8 shows a diagrammatic wiring circuit in which the lead-in wires 55 and 56 are connected to a suitable wall plug or the like. The motor within the casing 30 is energized through the wires 57 and 58, wire 58 being connected to the solenoid coil from which the same extends at 59 and is connected with the line 60, which latter wire connects to the heating element 61, the circuit through the heating element being completed through the wires 62, 63 and 56. This continually energizes the heating element as long as the plug is inserted into the wall socket or other source of electrical current. Wire 62, through wire 63, is also connected to the stationary terminal 64 of the switch 52, which switch has the movable terminal 65 controlled by the push element 53. Push element 53 and movable terminal 65 are normally held in open position by a spring arm 66 so that current is only supplied to the motor and solenoid when contact is made between the terminals 64 and 65 of the switch.

From the above, the operation of my invention will be as follows: the plug containing the elements 55 and 56 is plugged into a wall socket or the like which instantly energizes the electric heating element 47. When it is desired to have the lather extruded through the nozzle 25 the push button 53 will be depressed closing the circuit through the motor and the solenoid. This will start the motor in operation causing rotation of the screw member 24 in the lathering chamber in a direction to advance the mixture of liquid soap and air to the left as viewed in Figure 5. As explained above, air will enter through the space 27, which air will be thoroughly mixed with the liquid soap by the screw forming a lather, which

lather will be advanced to the left as seen in Figure 5. This lather will then be forced through the nozzle 25 and may be received by the hand of the operator whose hand is simultaneously holding the push button 53 depressed to close the circuit to the motor and solenoid. Energization of the solenoid will cause the solenoid plunger 40 to be drawn thereinto until its end strikes the stop member 39, which will move the lever 43 and cause its bottom end to push the rod 45 inwardly to unseat the ball valve from its port, thus permitting a desired amount of liquid soap to pass into the lathering chamber upon the rotating screw.

The amount of opening of the port by ball valve 15 will be controlled by the position of adjustment of the stop 39 within the solenoid. If a greater amount of liquid soap is desired to pass into the lathering chamber, the stop 39 will be adjusted to the right, as viewed in Figure 5, thus permitting a greater travel of the solenoid plunger and a greater opening of the ball from its port. As soon as the operator's hand is released from the push button 53 the spring 66 of the switch 52 will open the switch and deenergize the motor and solenoid, but permitting the energization of the heating element to continue as long as the plug is in the socket. This enables a very fine adjustment of the amount of liquid soap to be passed from the liquid receptacle into the lathering chamber, which adjustment may be regulated in accordance with the viscosity of the liquid soap.

By this construction when the operator, in a barber shop or other suitable place, wishes a handful or cupful of lather, all he has to do is walk up to the machine, press the push button 53, and hold his hand or cup below the open end of the nozzle 25 and the lather will be instantly forthcoming. The extrusion of lather will stop immediately upon release of the push button 53 for the reason that this causes the motor to be deenergized. At the same time, the solenoid will be deenergized, which will release the solenoid plunger and permit the spring 16 to push the ball back to its seat in the port, thus preventing further flow of liquid soap.

It is thus seen that I have provided a lather producing machine which is fully automatic in operation, requires the use of only one hand by the operator to secure lather at the nozzle outlet, is provided with a valve automatically operated by an electrical control, the amount of opening of the valve being adjustable and when once adjusted will remain so adjusted, in a machine having larger soap capacity and greater ease of operation, as well as producing a more perfect lather.

While I have referred to the lather producing and advancing member 24 as a lathering screw, I wish it understood that the same may be in the form of a screw as shown, or threads, or a spiral, or a feeder of any suitable construction, such that a sufficient amount of air will be sucked in and therealong to form a lather which will be advanced to and through the nozzle 25 when the machine is in operation.

I claim:

1. A lather producing machine comprising, a liquid soap receptacle, a lathering chamber below said receptacle, said receptacle and chamber having a passageway therebetween, a spring-pressed ball valve for opening and closing said valve, a motor, a motor-operated screw rotatably mounted in said chamber, and a solenoid connected to be energized and deenergized simultaneously with the energization and deenergization of the motor, and which solenoid when energized automatically opens said valve and when deenergized permits the same to close under spring action.

2. A lather producing machine as claimed in claim 1, having means in the solenoid for adjusting the amount the valve will be automatically opened when the solenoid is energized.

3. A lather producing machine comprising, a liquid lathering medium receptacle, a lathering chamber including a screw, means for rotating said screw, said receptacle and chamber having an intercommunicating passageway, a spring-pressed ball valve mounted over a port in said passageway, a rod slidably mounted to bear against one side of the ball, a solenoid, and a solenoid core for operating said rod to move the ball valve laterally with relation to the port when the solenoid is energized, the spring returning the valve to closed position when the solenoid is deenergized.

4. A lather producing machine comprising, a liquid soap receptacle, a lathering chamber below said receptacle, said receptacle and chamber having a passageway therebetween, a port in said passageway, a spring-pressed ball valve movable toward and away from the port, a screw in said chamber, a motor for rotating said screw, a solenoid having a core connected for opening and permitting closing of said valve, wiring having connection with the motor and solenoid and having a plug connectible with a source of electric current, a lather extruding nozzle in said chamber, and a switch in the wiring having a control portion adjacent the nozzle for operating the motor and solenoid when the control portion of the switch is pressed by the operator's hand adjacent the nozzle, said wiring being connected to simultaneously energize the solenoid when the motor is energized and to simultaneously deenergize the solenoid when the motor is deenergized.

5. A lather producing machine as claimed in claim 3, including a lever between the free end of the core and the free end of the valve operating rod for moving the rod in a direction opposite to the direction of movement of the core when the solenoid is energized, for controlling movement of the ball valve laterally of said port.

6. A lather producing machine comprising, a liquid lathering medium receptacle, a lathering chamber including a screw, means for rotating said screw, said receptacle and chamber having an intercommunicating passageway, a spring-pressed ball valve mounted over a port in said passageway, a rod slidably mounted to bear against one side of the ball, a solenoid, a solenoid core for operating said rod to move the ball valve laterally with relation to the port when the solenoid is energized, the spring returning the valve to closed position when the solenoid is deenergized, and adjusting means in the solenoid for adjusting the length of travel of the core for adjusting the amount of port opening movement of the valve.

7. A lather producing machine as claimed in claim 6, in which said adjusting means comprises a screw-operated-variable-stop against which the end of the core contacts when the solenoid is energized.

8. A lather producing machine comprising, a liquid soap receptacle, a lathering chamber below said receptacle, a screw rotatably mounted in said chamber, said receptacle and chamber hav-

ing a passageway therebetween, a valve for opening and closing said passageway to control the flow of liquid soap to the screw in the chamber, means for rotating said screw, the screw being arranged in the chamber to permit restricted access of air thereto and therealong, automatic means pushing against said valve in a direction parallel with the axis of the screw for opening the valve, said automatic means being operable only when the screw is rotating, said valve being a ball and the valve pushing means being a solenoid operated rod, and a solenoid for operating said rod, said solenoid being connected to be energized only when the screw rotating means is operated.

9. A lather producing machine comprising, a liquid soap receptacle, a lathering chamber below said receptacle, a screw rotatably mounted in said chamber, said receptacle and chamber having a passageway therebetween, a valve for opening and closing said passageway to control the flow of liquid soap to the screw in the chamber,

means for rotating said screw, the screw being arranged in the chamber to permit restricted access of air thereto and therealong, automatic means pushing against said valve in a direction parallel with the axis of the screw for opening the valve, said automatic means being operable only when the screw is rotating, said valve being a ball and movable laterally of said passageway, and adjustable means for controlling the amount said ball is moved laterally of the passageway.

ALBERT B. CAMPBELL.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,782,095	Jensen	Nov. 18, 1930
2,052,569	Jensen	Sept. 1, 1936
2,301,851	Boerger	Nov. 10, 1942
2,323,377	Campbell	July 6, 1943