Sept. 9, 1952 G. C. JOHNSON ET AL 2,610,090

LATHER MACHINE

Filed April 11, 1945 5 Sheets-Sheet 1

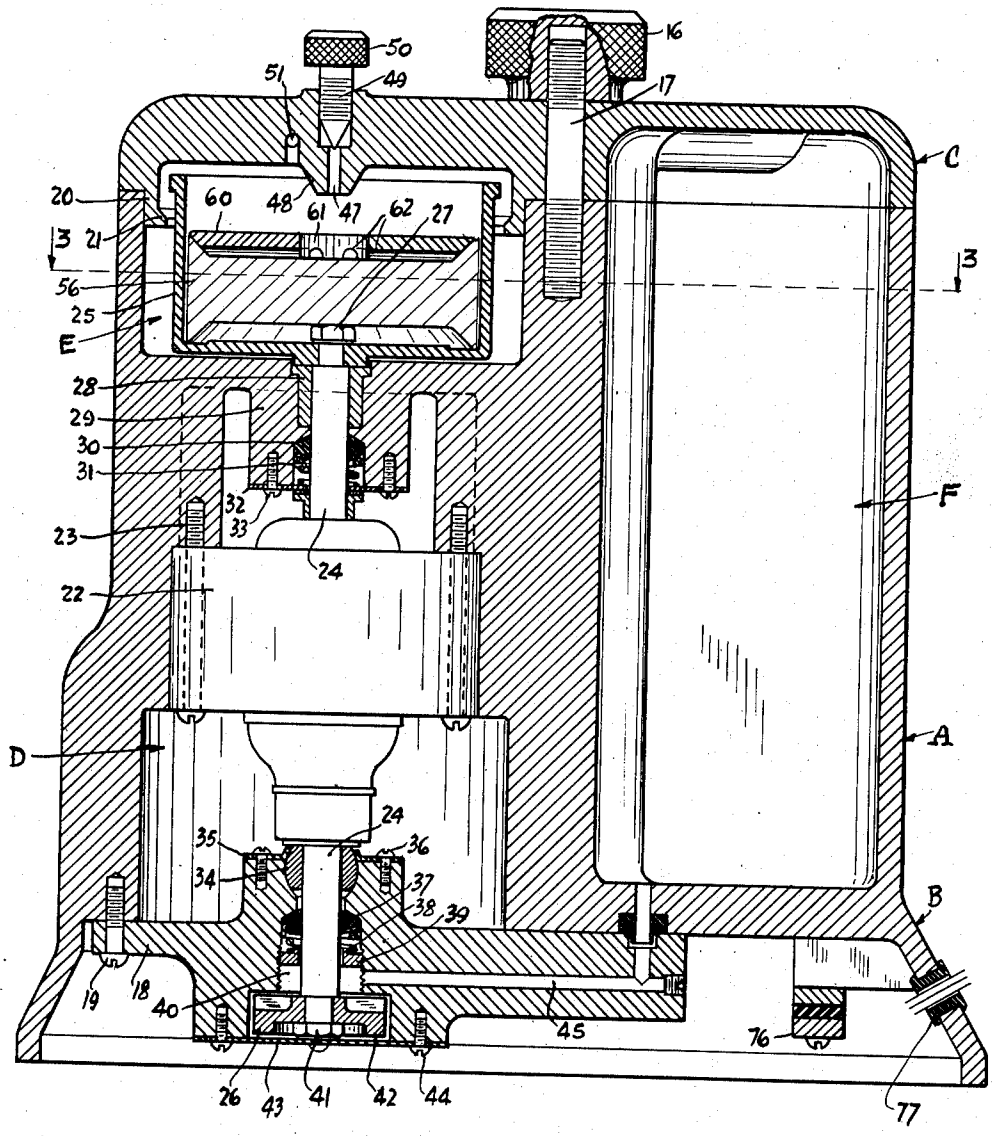


FIG. I

Inventors

GORDON C. JOHNSON
ALDEN O. JOHNSON

By Carlson & Hayes

Attorneys

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LATHER MACHINE

Filed April 11, 1945 5 Sheets-Sheet 2

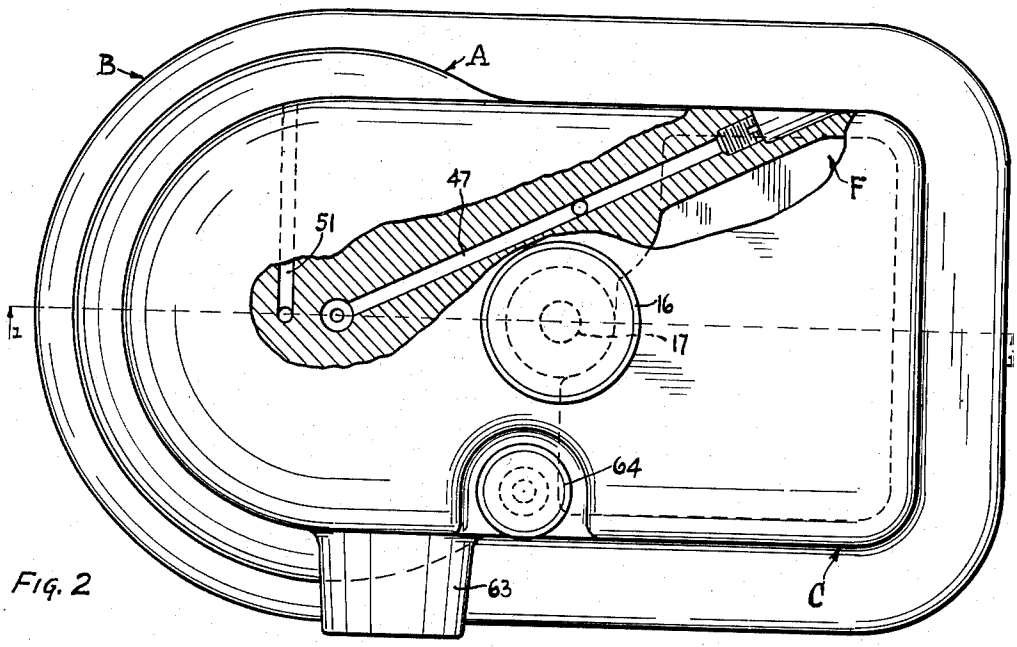


FIG. 2

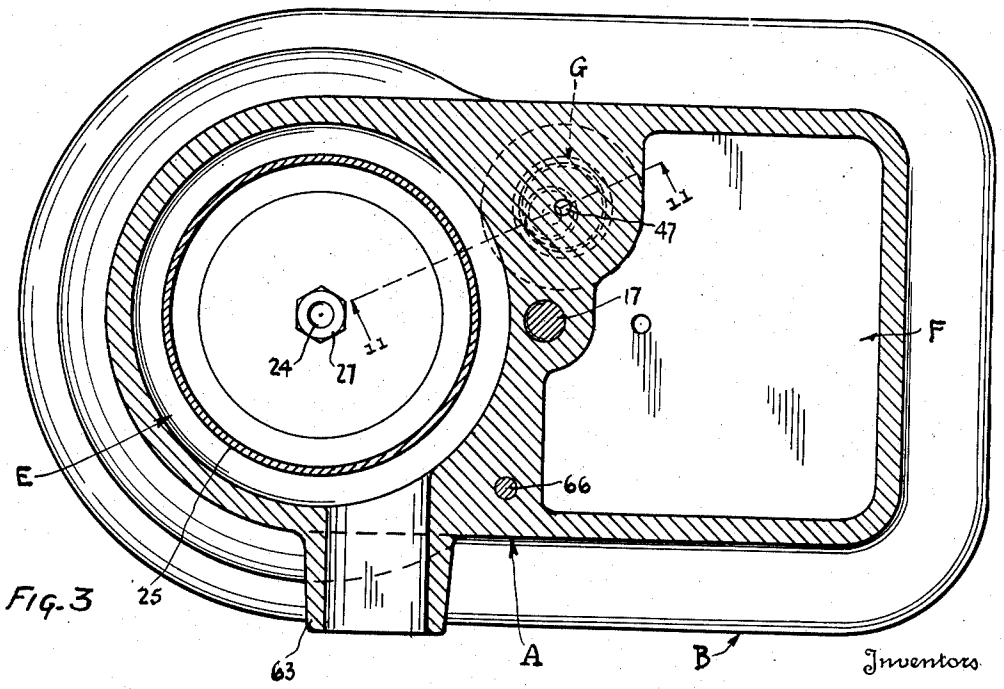


FIG. 3

Inventors

GORDON C. JOHNSON
ALDEN O. JOHNSON

By Carlson & Hayle

Attorneys

Sept. 9, 1952 G. C. JOHNSON ET AL 2,610,090

LATHER MACHINE

Filed April 11, 1945 5 Sheets-Sheet 3

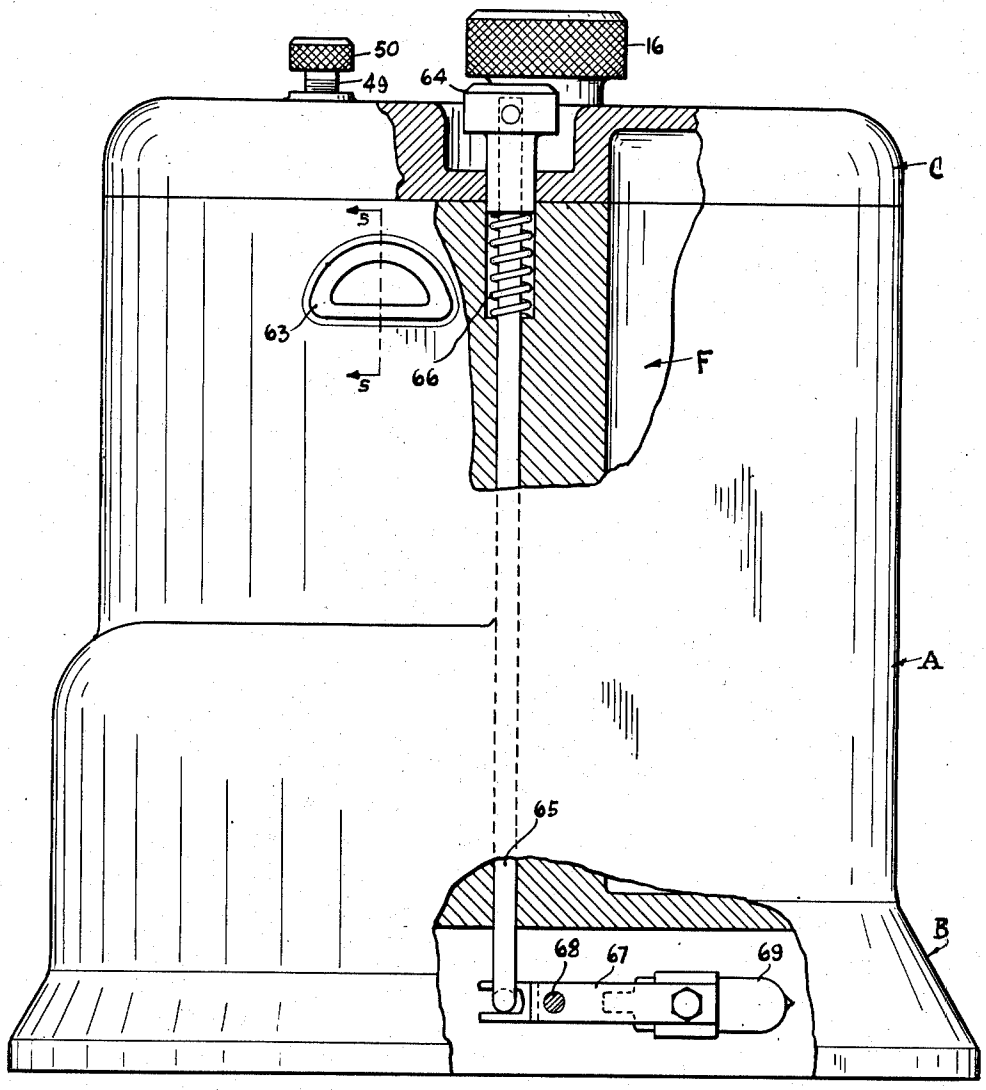


FIG. 4

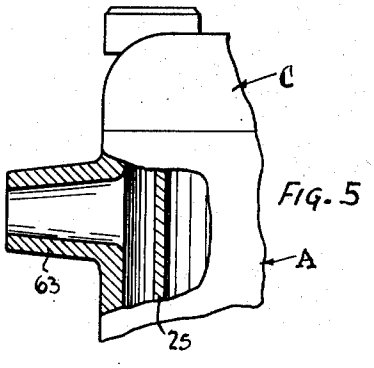


FIG. 5

Inventors

GORDON C. JOHNSON
ALDEN O. JOHNSON

By Carlson & Hazle

Attorneys

Sept. 9, 1952 G. C. JOHNSON ET AL 2,610,090

LATHER MACHINE

Filed April 11, 1945 5 Sheets-Sheet 4

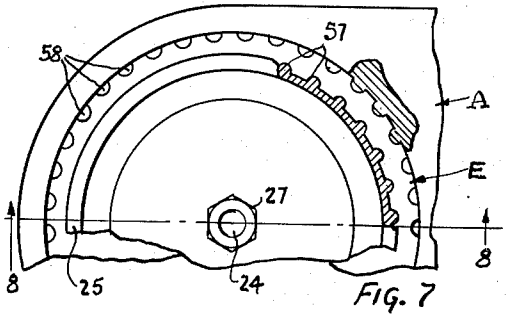


Fig. 7

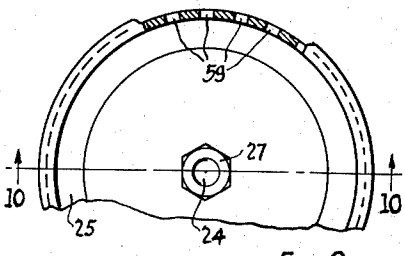


Fig. 9

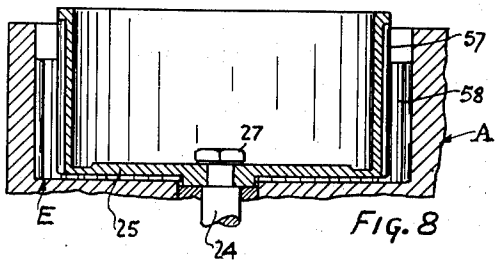


Fig. 8

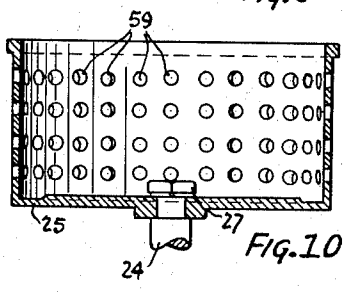


Fig. 10

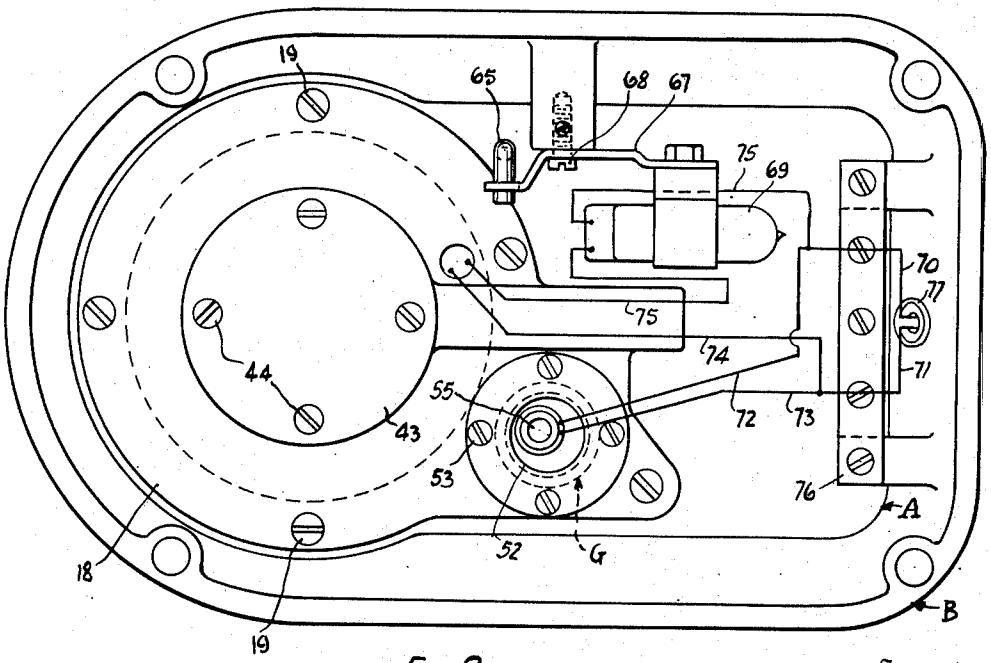


Fig. 6

Inventors

GORDON C. JOHNSON
ALDEN O. JOHNSON

By Carlson & Hayle

Attorneys

Sept. 9, 1952 G. C. JOHNSON ET AL 2,610,090

LATHER MACHINE

Filed April 11, 1945 5 Sheets-Sheet 5

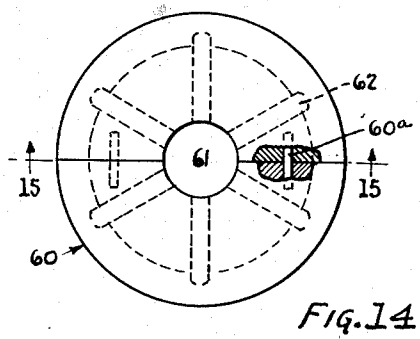


FIG. 14

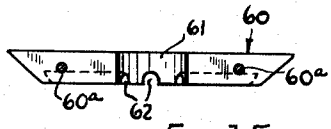


FIG. 15

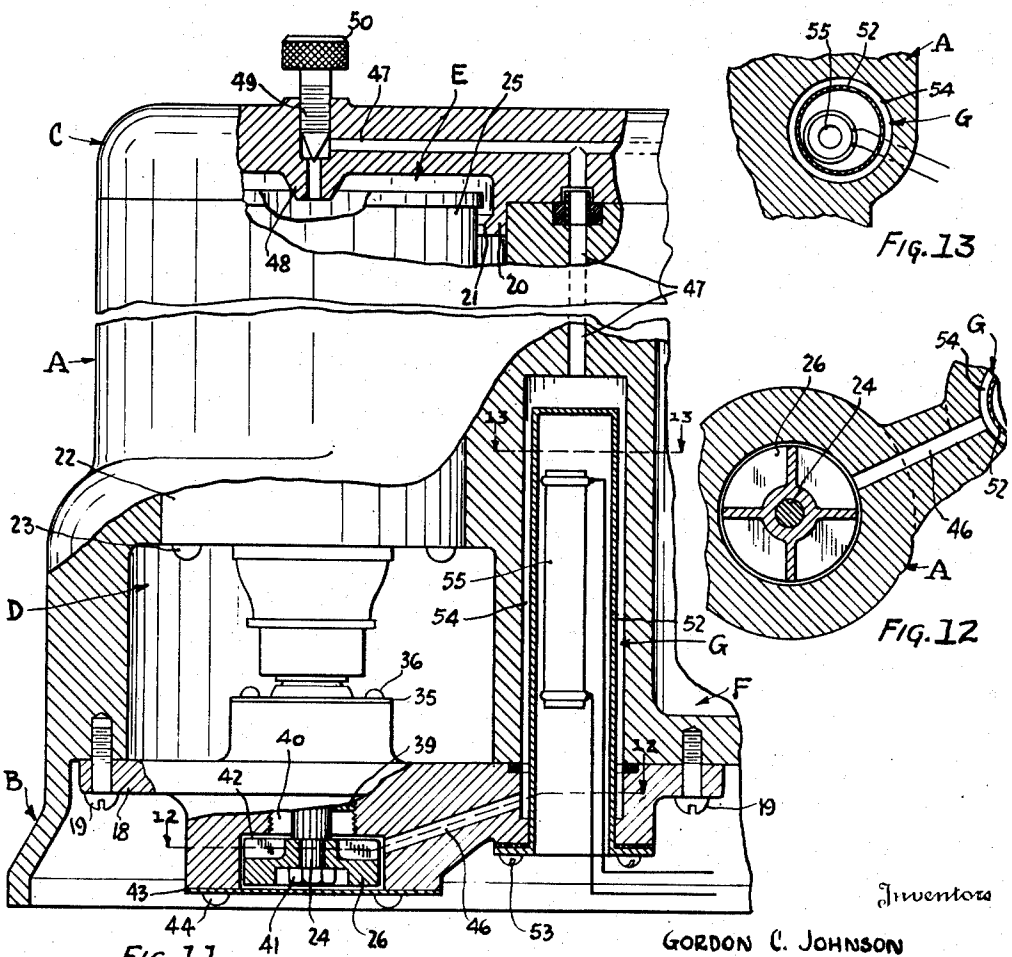


FIG. 11

FIG. 13

FIG. 12

Inventors

GORDON C. JOHNSON

ALDEN O. JOHNSON

By Carlson & Hayle

Attorneys

Patented Sept. 9, 1952

2,610,090

UNITED STATES PATENT OFFICE

2,610,090

LATHER MACHINE

Gordon C. Johnson and Alden O. Johnson, Minneapolis, Minn., assignors to John Oster Manufacturing Company, Racine, Wis., a corporation of Wisconsin

Application April 11, 1945, Serial No. 587,692

11 Claims. (Cl. 299—83)

1

This invention relates to lather making machines for use in barber shops, wash rooms, and like places where it is desired to produce soap lather for shaving or washing purposes, and the primary object is to provide motor operated means for quickly, efficiently, and economically producing warm rich lather from a cake of soap.

Heretofore, lather making machines employed either a liquid soap which the barber had to mix and keep on hand, or they had brushes or the like wiping across the surface of a bar or cake of solid soap. The patent to Jensen No. 2,052,569 is an example of the former type of lather making machine, and the patent to Rolstad et al., No. 2,344,170, is an example of the latter type. Both have serious disadvantages. In the case of the liquid soap variety, since it is not feasible to mix up small batches of the liquid soap, the inconvenience of having to store larger amounts thereof coupled with the messiness of making up the solution was an inherent objection; and while the other brush type overcame this objection, its dependence upon brushes made it unsanitary and subject to considerable servicing since the brushes wore out in a relatively short time.

Recognizing the objections of these lather-making machines of the past, it is an especially important object of this invention to provide a lather making machine which makes its own soap solution from an easily replaced bar or cake of soap and water entirely without the need for brushes or the like wiping across the surface of the soap.

More specifically it is an object of this invention to provide a lather making machine in which a soap solution is made solely by the action of water moving recurrently across the surface of a bar or cake of solid soap.

A further object is to provide a lather making machine in which hot water is employed, and in which it is heated, but wherein the water is only heated as it is actually needed and used, with a result that it is unnecessary to provide a reservoir or supply of water with means for keeping it permanently heated.

A further object is to provide a novel arrangement of devices whereby a single motor is operative to simultaneously circulate water past the heating element and into the lather mixing chamber, while also rotating certain of the lathering elements in conjunction therewith to produce the desired results.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

2

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Fig. 1 is a sectional elevation of the machine as seen substantially on the line 1—1 in Figure 2.

Fig. 2 is a top or plan view of the machine, with fractional parts broken away to show certain passageways.

Fig. 3 is a horizontal sectional plan as on line 3—3 in Fig. 1.

Fig. 4 is a side elevation of the machine, with parts broken away for illustration purposes.

Fig. 5 is a detail view, partly in section, as on line 5—5 in Fig. 4.

Fig. 6 is a bottom plan view of the machine and with the electric circuit wiring shown diagrammatically.

Fig. 7 is a detail plan view, with fractional parts broken away, showing a modified form of mixing device.

Fig. 8 is a sectional elevation on line 8—8 in Fig. 7.

Fig. 9 is a plan view, with parts broken away, illustrating a further modification in the soap receptacle or cup of the mixing device.

Fig. 10 is a sectional elevation on line 10—10 in Fig. 9.

Fig. 11 is a side elevation of a portion of the machine and with various parts sectioned away on line 11—11 in Fig. 3.

Fig. 12 is a detail sectional plan view on the irregular line 12—12 in Fig. 11.

Fig. 13 is a detail sectional view on line 13—13 in Fig. 11.

Fig. 14 is a detail plan view of a soap scraper disk, which may but need not be used, a fractional portion thereof being broken away.

Fig. 15 is a detail section on line 15—15 in Fig. 14.

Referring to the drawings more particularly and by reference characters, A designates the main block or body member of the machine which is preferably of cast metal and includes a shallow integrally formed base B. A removable cover C fits snugly and neatly upon the upper end of the body member A, and is releasably secured by a

single knurled nut 16 which is threaded upon the upper end of a stud bolt 17 anchored in the block A.

The body block A is provided with four chambers D, E, F and G, chamber D being a motor compartment, E being the chamber in which the lather is formed, chamber F being a water reservoir, and chamber G being an enlargement in a water circulating and heating passageway.

The chambers D and G open downwardly and are normally closed by a cover plate 18 concealed within the base B and releasably secured by screws or bolts 19. The chambers E and F project upwardly into the cover C and are of course normally closed thereby. I may here be noted that the cover C has a centering flange 20 (Figs. 1 and 11) which fits snugly within the chamber recess E in the block A, thus accurately locating the cover C on the main body casting of the machine. This flange 20 has an inner peripheral bead 21 forming a restricted annular passageway between itself and a soap receptacle or cup 25, as will presently be set forth.

An electric motor 22 is secured by screws 23 in the chamber D, the motor casing fitting in a suitably formed recess, and this motor has a double ended shaft 24 the upper end of which projects axially into the chamber E while the lower end extends downwardly into the cover plate 18. Thus the motor simultaneously rotates the cup 25, in the chamber E, and a water pump 26 in the plate 18, and operates both elements at the same speed of rotation. The cup 25 is rigidly but releasably secured to the upper end of the shaft 24 by a nut 27.

The upper end portion of the shaft rotates in a bushing 28 in a bearing portion 29 of the body casting, and a watertight seal is effectively formed by a packing ring 30 disposed in a tapered annular recess and yieldingly held in place by a spring 31, tension on which is maintained by a washer or plate 32 secured at 33, as shown in Fig. 1.

The lower end portion of shaft 24 rotates in a self-aligning spherical bearing 34 held in place by a keeper 35 secured as at 36, and therebelow extends through a sealing ring 37 maintained by a spring 38 the tension of which is regulated by a threaded plug 39 disposed in a recess 40. The pump element 26 is of the vaned, centrifugal type, and is secured by a nut 41, the pump chamber 42 being closed by a cover plate 43 fastened as at 44.

When the pump 26 is rotated it draws water from the reservoir F through a duct 45 that communicates with the recess 40 (Fig. 1) and then expels the water through a duct 46 (Figs. 11 and 12) into the heating chamber G which in turn communicates with the lathering chamber E through a passageway or duct 47. This latter duct terminates in a nozzle 48 (Figs. 1 and 11) that is axially disposed over the cup 25 and is controlled as to the volume of its discharge by a valve 49 having an exposed and easily accessible knurled head 50. Air is admitted to the lathering chamber through a duct 51 that opens to the atmosphere (Figs. 1 and 2).

Referring again to Figs. 11 and 13 it will be seen that within the chamber G there is disposed a receptacle 52 that is open at its bottom where it is rigidly secured, as at 53, in the plate 18. Hence the receptacle 52 projects centrally upwardly into the chamber G to define a restricted annular space 54 between itself and the cylindrical wall of the chamber. A heating coil 55 is contained within the receptacle 52 to heat the same and as the relatively thin annular flow of water passes upwardly around the comparatively large heating surface of the receptacle it will be evident that the water will be quickly and efficiently heated, when to be used.

The cup 25 is of such shape and size as to freely but snugly receive a cake of soap 56 which sufficiently adheres to the cup so as to spin with it when the latter is rotated by the motor 22. As shown in Fig. 1 the cup 25 is provided with plain vertical walls. In the design shown in Figs. 7 and 8 the outer surface of the cup wall is provided with vertical beads or corrugations 57, and in this instance the opposed wall of the lathering chamber is similarly provided with embossed ribs or corrugations 58 and these cooperate with the corrugations 57 to churn and render more creamy the lather produced. In the modified form of soap receptacle shown in Figs. 9 and 10 the walls thereof are provided with profusely distributed perforations 59 also effective in quickly producing the desired consistency of lather.

The disk 60 shown resting upon the soap in Fig. 1 is of waferlike form having a central opening 61 into which hot water may be directed from the nozzle 48. The bottom surface of the disk is provided with radially extending flutes or corrugations 62 through which the water is centrifuged outwardly over the soap surface and which also form edges that have scraping contact with the cake of soap upon relative rotation between the disk and the soap to very gradually scrape or wear off the surface portions of the soap to facilitate dissolving the soap in the water. The disk, as shown in Figs. 14–15, preferably consists of two complementing halves or sections connected by dowel pins 60a.

In the construction illustrated in Fig. 1, when the motor 22 is energized it rotates the shaft 24, the cup 25 and the soap cake 56 at relatively high speed, while simultaneously operating the pump 26 to supply hot water to and through the nozzle 48 and down into the disk opening 61. Since the disk 60 is of fairly heavy metal and in no way restrained with respect to the cup 25, it, too, will rotate by reason of the floating frictional contact with the soap; but it will not spin as fast since it is not positively or mechanically rotated. Furthermore the presence of the gradually supplied flow of water will have a retarding effect on disk rotation, and particularly since such fluid supply will tend to lubricate the contacting surfaces. Hence, where the disk 60 is used, it assists the action of the water flowing across the surface of the soap to dissolve the soap and make the soap solution needed to produce the lather. However, since repeated contact between the water and soap is necessary to produce a soap solution, the explanation for the successful operation of the machine no doubt lies in the fact that the various parts thereof are so disposed and arranged with respect to each other that they coact to not only impart flow to the water across the top or exposed surface of the soap (i. e. exposed to the water) but also direct the flow in such manner as to redirect the water leaving the peripheral edge of the soap over the top thereof and thereby effect recurrent flow of the water across the exposed surface of the soap.

Such redirection of the water and forming soap solution across the top of the soap is no doubt explained by the fact that the side wall of the soap receptacle, the top of the soap therein and

the underside of the cover define a relatively closed chamber, the bottom and sides of which are spinning and into the center of which water is discharged. In any event, the action thus produced will quickly and effectively produce a rich creamy lather (necessary air coming in through duct **51**) which will build up in the cup and ultimately find its way over the edge thereof, down through the restricted annular passageway about the cup, and into the annular space between the cup and the adjacent side wall of chamber E and then out through the spout **63** (Figs. 2, 3, 4 and 5) into the hand of the operator. With certain types of soap or with other variable conditions, where greater lathering efficiency is required, then either of the devices shown in Figs. 7–8 or 9–10 may be used to advantage.

While the cavity in the body or housing in which the cup **25** revolves has been identified generally as the lathering chamber E, strictly speaking the lathering chamber, i. e. the zone in which the primary lather is produced, is the space bounded by the top of the soap cake, the inner side wall of the cup and the walls of the cavity in the underside of the cover C which registers with the cavity E. As stated above, the lather which forms in this space disgorges therefrom over the edge of the cup and enters the annular space between the side of the cup and the adjacent side wall of the chamber E, where it is conditioned to the desired consistency.

The various units of the device are all controlled by a single control member, namely a knob **64** (see Fig. 4), and this is preferably located in such a position that it may be operated by the same hand that is placed to receive lather from the spout **63**.

The knob **64** is mounted upon the upper end of a rod **65**, which is vertically slidable in the body block A, and both rod and knob are normally held in a yieldably raised position by a spring **66** (Fig. 4). At its lower end the rod **65** projects into the hollow base B where it engages a lever **67**, fulcrumed as at **68**, and which lever tiltably supports a conventional mercury switch **69**.

In the wiring diagram indicated in Fig. 6, the main current supply wires **70** and **71** are shown as in permanent circuit, through wires **72** and **73**, respectively, with the heating element **55**. This is a preferable arrangement since the wires **70—71** are contained in a cord or cable having a conventional plug connection with a wall socket, and when the machine is to be used it is convenient to first make such a connection a few moments in advance so that there will be a preliminary heating of water before the lathering mechanism is operated. It is to be understood, however, that if so desired a separate control switch for the element **55** may be used, or it may be connected in circuit with the mercury switch **69** or with the motor through a delayed action switch so that the heating element will be energized in advance of the motor.

The feed circuit **70—71** is connected to the motor **22** through wires **74** and **75**, the latter of which includes the mercury switch **69**. The various wires may be conveniently secured by an insulated anchor strip **76**, and the feed circuit cable may conveniently extend through an opening **77** in the base flange.

To operate the device the operator first closes the circuit to the heating element **55**, in any of the ways above suggested. After a predetermined time interval he then places his hand under the spout **63**, and with a finger of the same or the other hand, depresses the knob **64** against the tension of the spring **66**. This tilts and closes the switch **69** to energize the motor **22**. The motor then operates the pump **26** to pass water from the reservoir F up through the heating chamber and to the lathering area where the soap cake is then being rapidly rotated to produce the lather which then fills the intermediate spaces and is discharged from the machine through spout **63**.

As soon as the desired amount of lather has been discharged the operator merely releases the knob **64** thus again opening the switch and de-energizing the motor to stop the operation.

From the foregoing description taken in connection with the accompanying drawings it will be readily understood that this invention provides a lather making machine which produces its own soap solution from solid bar soap directly in the lathering chamber and without brushes wiping across the soap, and that as a result of this manner of producing the solution proper concentration thereof is automatically assured, and as soon as the soap solution reaches lather-making concentration the agitation within the lathering chamber converts it into lather.

We claim:

1. In a lather mixer, a soap cake holder mounted for rotation to rotate the soap cake, means for contacting the surface of the soap cake to remove particles of soap by such rotation, a pump for supplying a controlled flow of liquid to the soap cake to produce lather, and a motor for simultaneously operating the pump and rotating said holder.

2. In a lather mixer, a soap cake holder mounted for rotation to rotate the soap cake, means for contacting the surface of the soap cake to remove particles of soap by such rotation, a pump for supplying a controlled flow of liquid to the soap cake to produce lather, and a motor having a shaft projecting axially in both directions therefrom, one end of the shaft being operative to rotate the holder and the other end of the shaft being connected with the pump to operate the same.

3. In a lather mixer, a cup mounted for rotation about a vertical axis and for containing a cake of soap to be rotated therewith, means for rotating the cup, a scraper element for resting upon the soap cake within the cup walls, said scraper element having a central aperture adapted to receive liquid, and means for directing liquid to said aperture.

4. In a lather mixer, a cup mounted for rotation about a vertical axis and for containing a cake of soap to be rotated therewith, means for rotating the cup, a scraper element for resting upon the soap cake within the cup walls, said scraper element having a central aperture adapted to receive liquid, and means for supplying liquid to the aperture, the said scraper element having its bottom surface provided with recesses to spread the liquid over the surface of the soap cake to form lather under the spinning action of the cake against the scraper element.

5. In a lather mixer, a chamber having a soap support rotatably mounted therein, the top of a cake of soap held by said support together with the adjacent walls of the chamber and the soap support defining a lathering chamber, a liquid reservoir, a liquid heating chamber having a heating element associated therewith, a pump for circulating liquid from the reservoir through the heating chamber to the lathering chamber,

and means for simultaneously operating the pump and rotating the soap support.

6. In a lather mixer, a chamber having an upwardly opening motor driven cup mounted therein for rotation about a vertical axis and adapted to contain a soap cake means for discharging water in small regulated volume onto the soap in the cup for admixture with soap particles eroded from the surface of the soap to produce a liquid soap solution, said chamber providing an annular space about the cup, to receive lather from within the cup by centrifugal force incident to rotation of the cup, and a spout for delivering lather from said annular space to the exterior of the mixer, the wall of said chamber and the exterior wall of the cup having opposed cooperating projections relatively movable in opposite directions when the cup is rotated to condition the lather before it is discharged through the spout.

7. In a lather mixer, a body member having a chamber provided with a discharge spout, a soap support rotatably mounted in said chamber, a water reservoir, a water heating chamber, a pump having an inlet communicating with the reservoir and an outlet communicating with the heating chamber, said heating chamber having an outlet communicating with said chamber containing the soap support to feed heated water thereto at a point substantially axially above the soap support, and a motor having driving connections with the pump and soap support to simultaneously operate both.

8. A lather making machine comprising: a housing; soap holding means rotatably mounted in the housing and coacting with portions thereof to define a lathering chamber, said soap holding means being adapted to hold a bar of soap with at least one surface thereof exposed to the interior of the lathering chamber; the housing having an air inlet leading directly to the lathering chamber and having a discharge port for lather; a restricted water inlet leading to the lathering chamber and arranged to supply water to the exposed surface of a bar of soap held by the soap holding means in quantities small enough for proper lather making; a water reservoir to hold a supply of water; conduit means connecting the reservoir with the restricted water inlet, part of said conduit means providing a heating chamber; a heater associated with the heating chamber for heating water therein so that the water is heated as it flows from the reservoir to the lathering chamber; and means for revolving the soap holding means to spin the bar of soap held thereby and, by the resulting centrifugal action, effect relative movement between the water and the exposed surface of the soap.

9. A lather making machine comprising: means defining a lathering chamber; soap holding means adapted to hold a bar of soap with one surface thereof exposed to the interior of the lathering chamber; means for introducing air and water directly into the lathering chamber; means for effecting lather making contact between the air, water and the exposed surface of the soap to form lather in said lathering chamber; means defining a lather conditioning chamber in open communication with the lathering chamber to receive lather therefrom; agitating means in the conditioning chamber operable upon lather therein to whip the same into a creamy consistency; and means defining a lather discharge port leading from the conditioning chamber.

10. The lather making machine of claim 9 further characterized by the fact that said means for introducing water into the lathering chamber includes a reservoir, conduit means leading from the reservoir to the lathering chamber, part of said conduit means providing a heating chamber, and a heater for heating water in the heating chamber.

11. The lather making machine of claim 9 further characterized by the fact that the soap holding means has a cylindrical side wall concentric to and spaced from the adjacent side wall of the lathering chamber to thus define the lather conditioning chamber; and wherein said agitating means comprises corrugations on said side walls.

GORDON C. JOHNSON.
ALDEN O. JOHNSON.

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