

[54] LATHER MAKING APPARATUS

[72] Inventors: **John P. Duve**, Brookfield; **Stanton H. Petry**, Arlington Heights, both of Ill.

[73] Assignee: **Sunbeam Corporation**, Chicago, Ill.

[22] Filed: **June 11, 1970**

[21] Appl. No.: **45,425**

[52] U.S. Cl.**252/359 E**, 239/343, 259/DIG. 36, 222/190

[51] Int. Cl.**B01d**, B67d 5/58, B01f

[58] Field of Search252/359 E; 159/DIG. 4; 239/343; 259/DIG. 36; 261/DIG. 26; 222/190

[56] References Cited

UNITED STATES PATENTS

2,310,379	2/1943	Wahl.....	252/359 E
2,344,170	3/1944	Rolstad et al.	252/359 E
2,756,102	7/1956	Switzer	252/359 E

2,919,837	1/1960	Rolstad	222/145
3,215,642	11/1965	Levy	252/359 E
3,523,908	8/1970	Levy	252/359 E

Primary Examiner—Norman Yudkoff

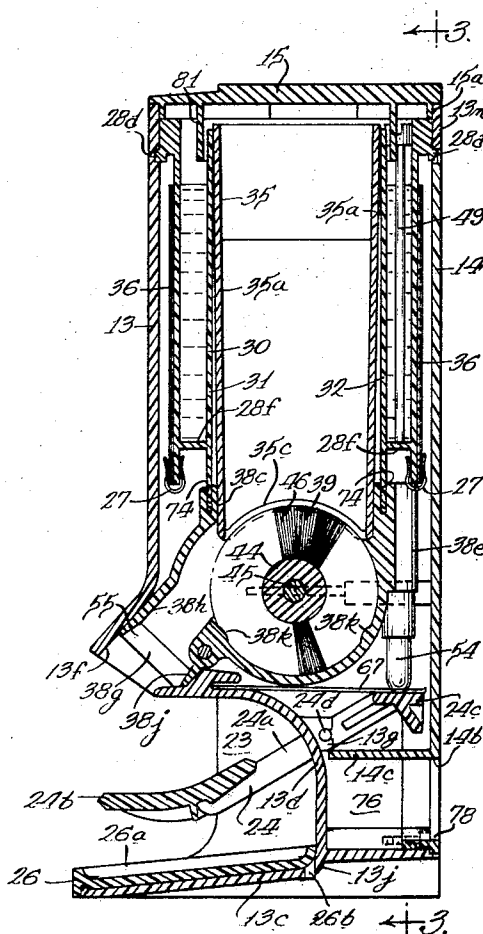
Assistant Examiner—J. Sofer

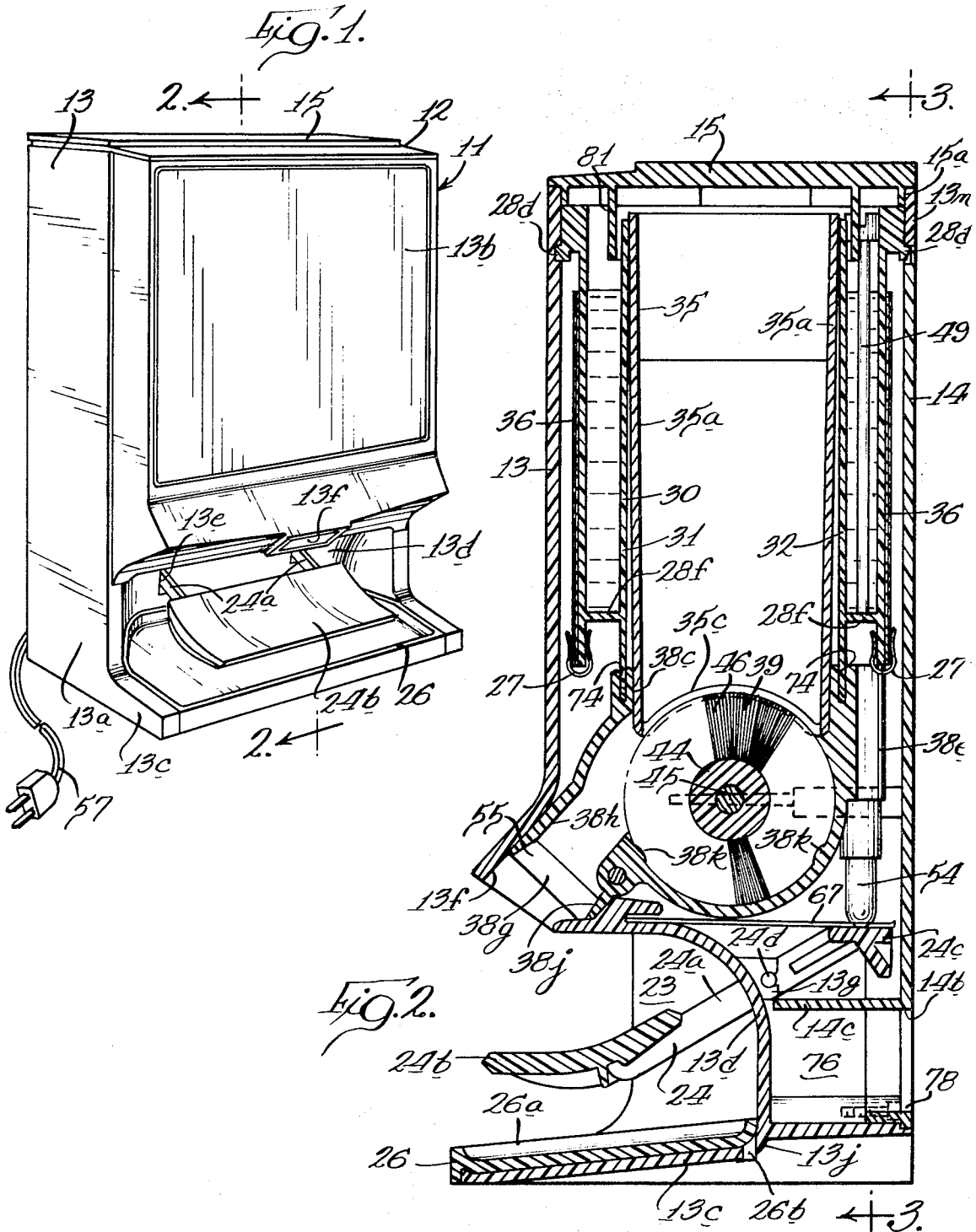
Attorney—George R. Clark

[57] ABSTRACT

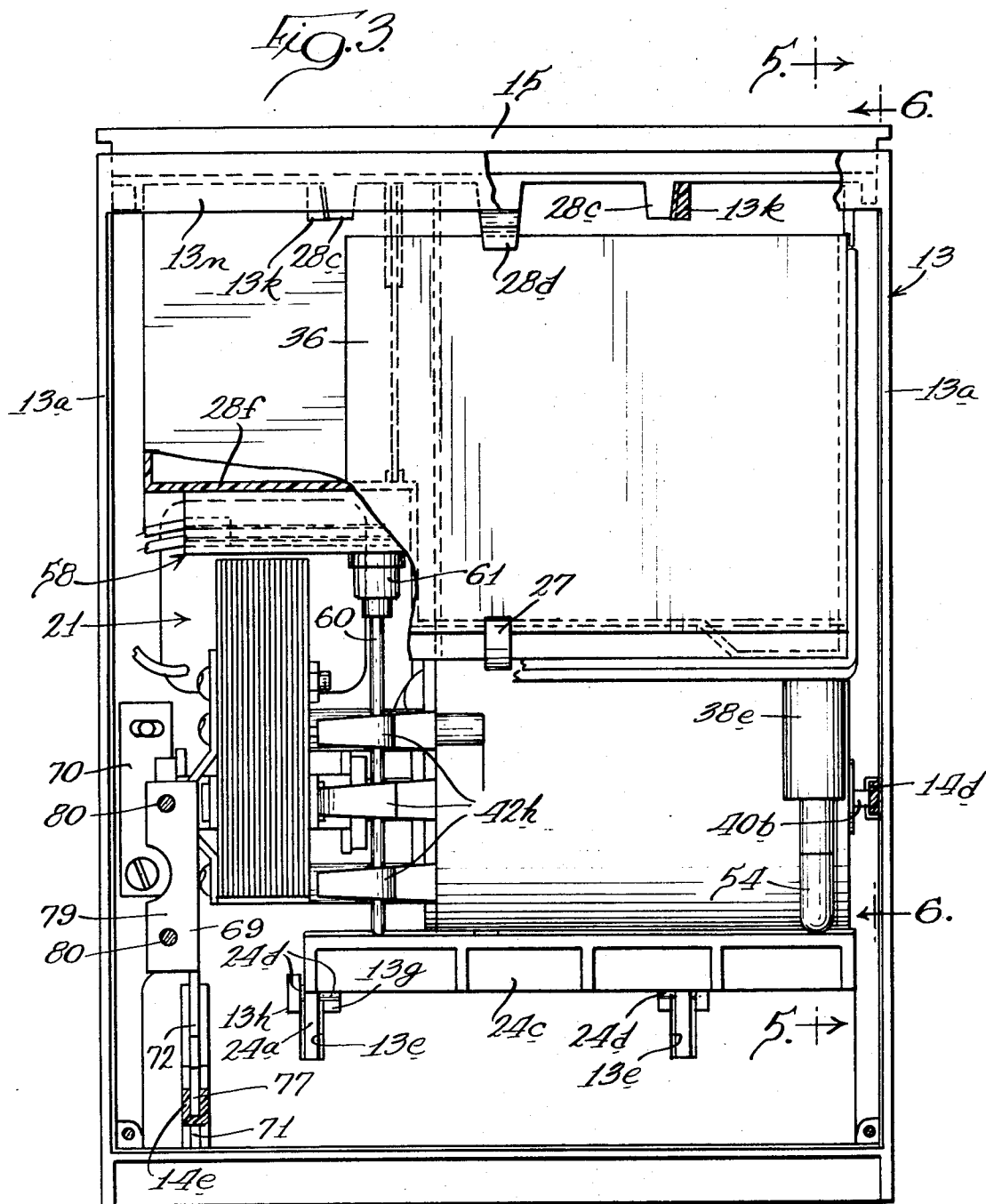
A motor driven appliance for making soap lather by rotating a cylindrical brush in contact with a bar of soap in the presence of water. The lather is generated in a chamber nested beneath a water reservoir having means for dispensing the water into the chamber simultaneously with the actuation of the motor which rotates the brush. The vertically extending passageway for receiving the bar of soap is disposed within the water reservoir and connects to the top of the generating chamber. The chamber is sloped away from the lather discharge opening and a dam is provided to prevent the discharge of accumulated liquid along with the lather.

20 Claims, 12 Drawing Figures





Inventors:
John P. Duve
Stanton H. Petry
By Neil M. Rose
Att'y



Inventors:
 John P. Duve
 Stanton H. Petry
 By Neil M. Rose
 Att'y

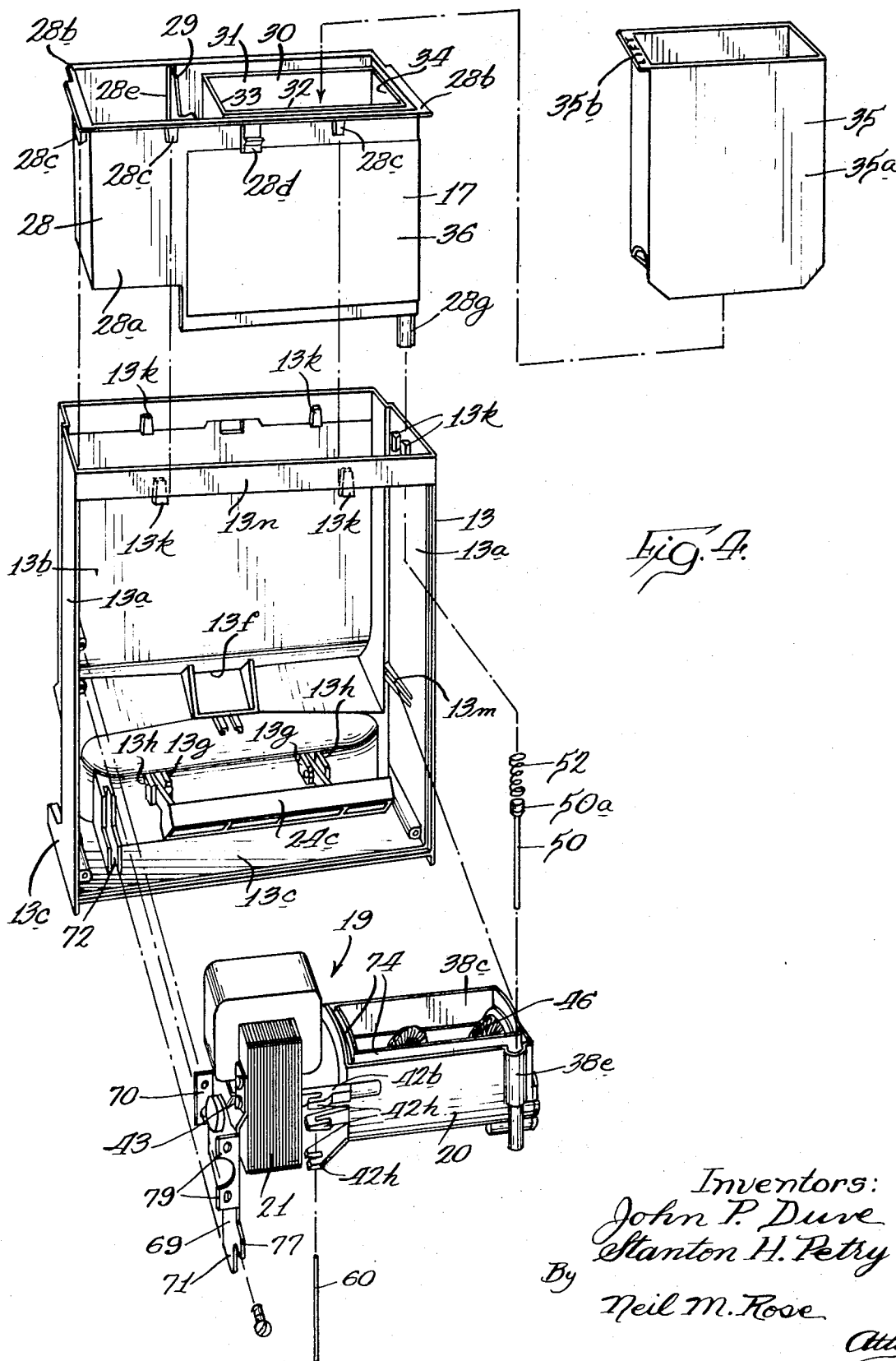


Fig. 5.

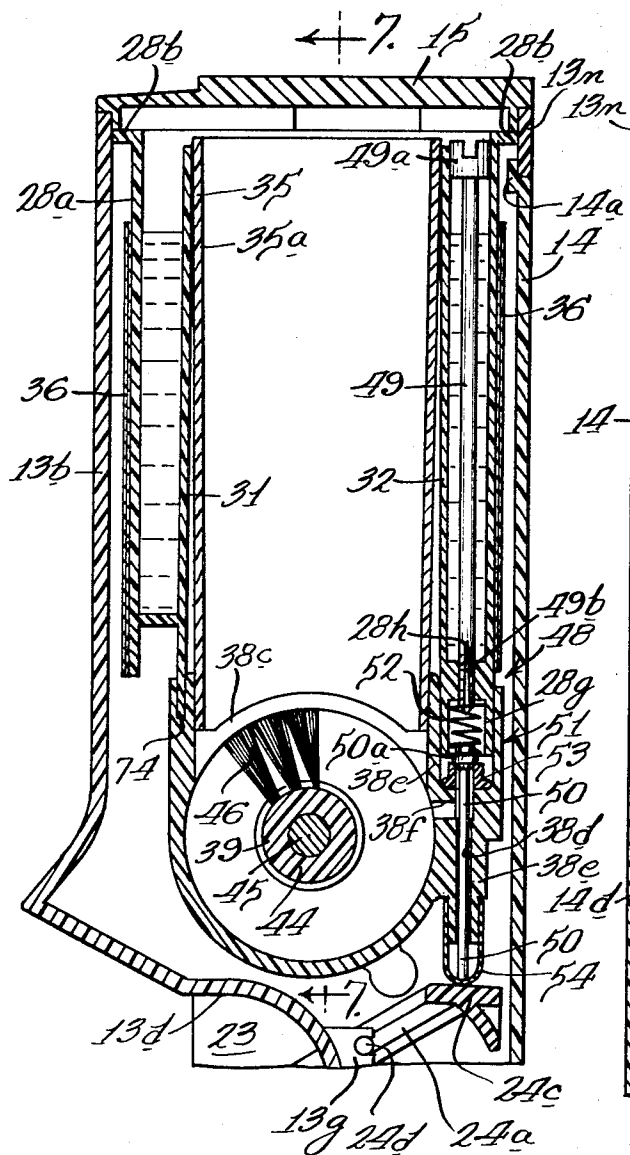
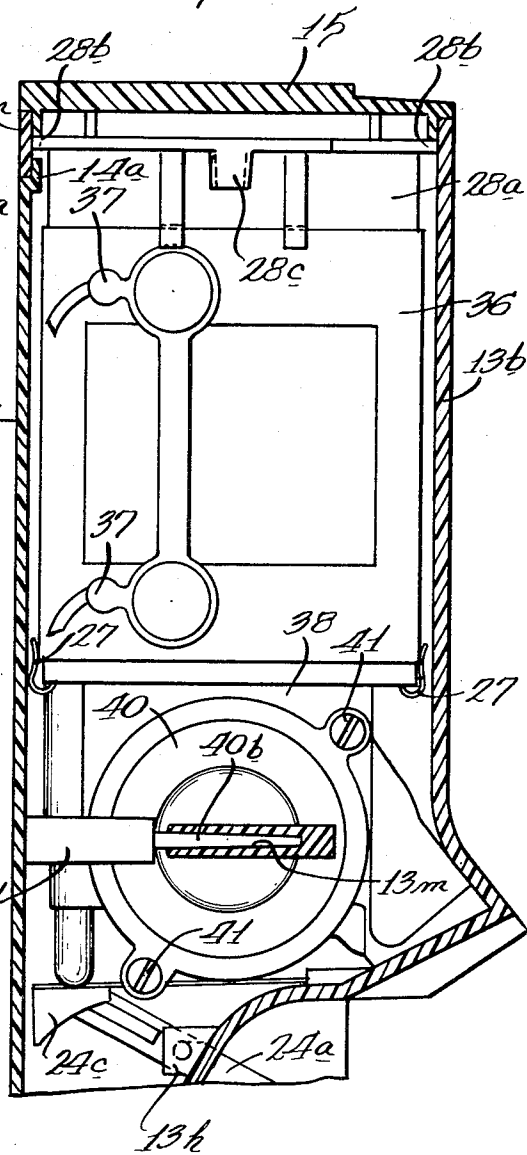
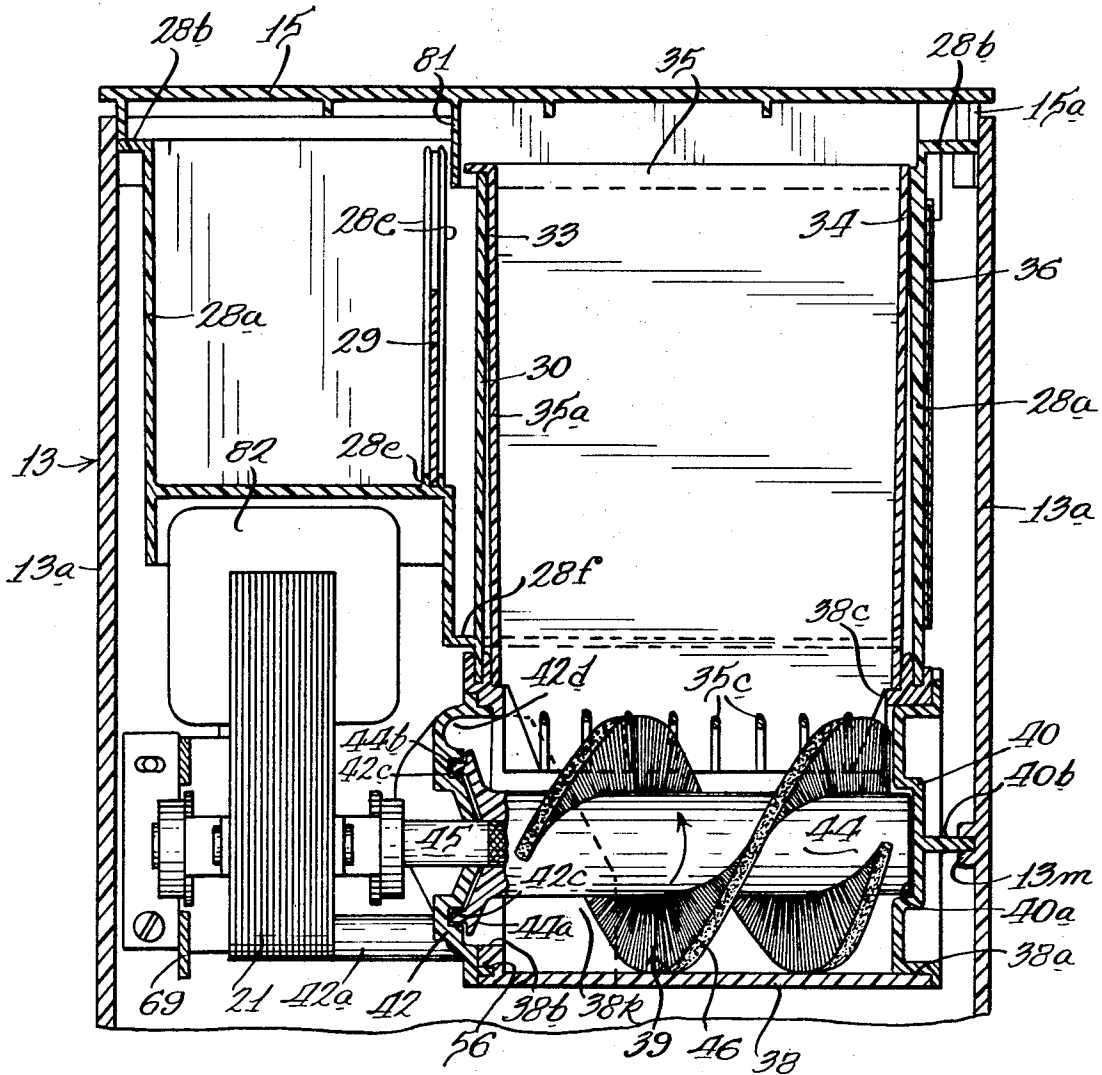


Fig. 6.



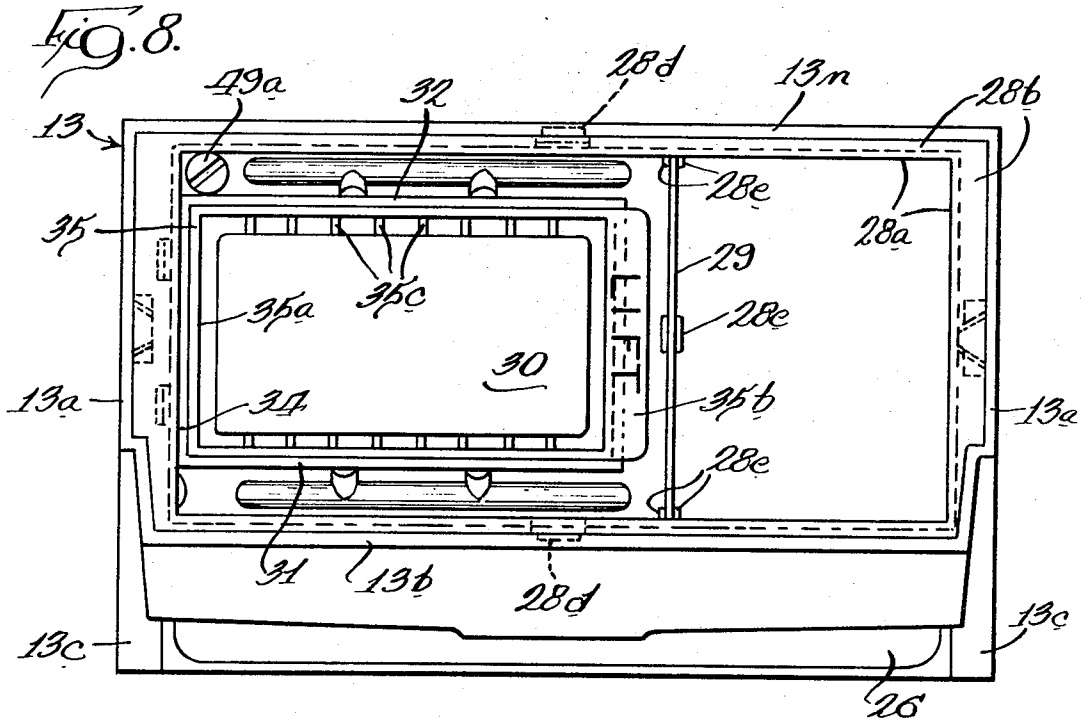
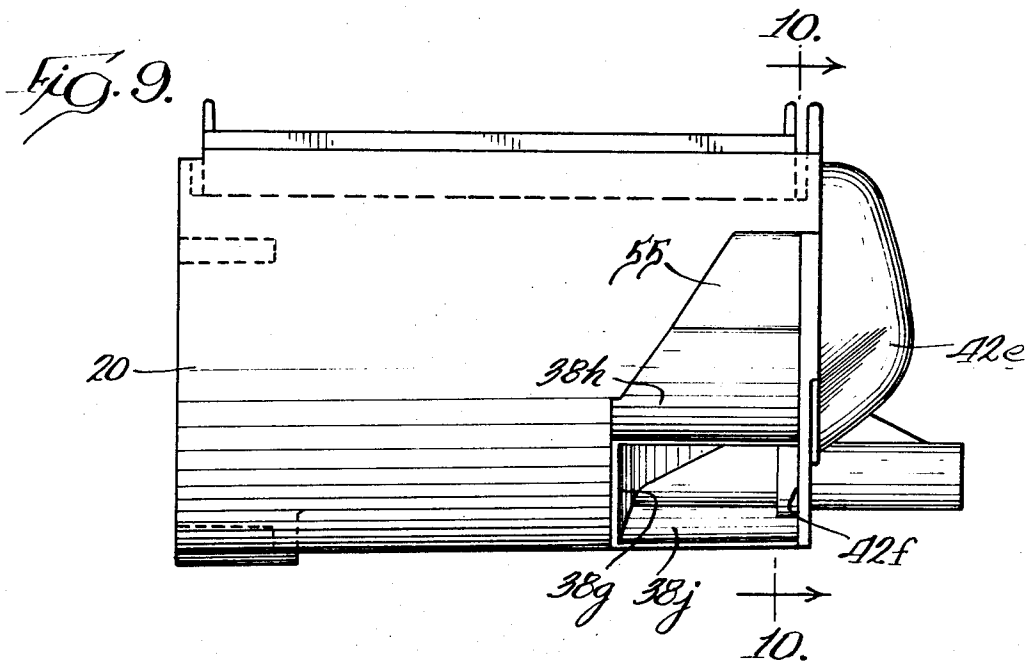
Inventors:
John P. Duve
Stanton H. Petry
By Neil M. Kove atty

Fig. 7.

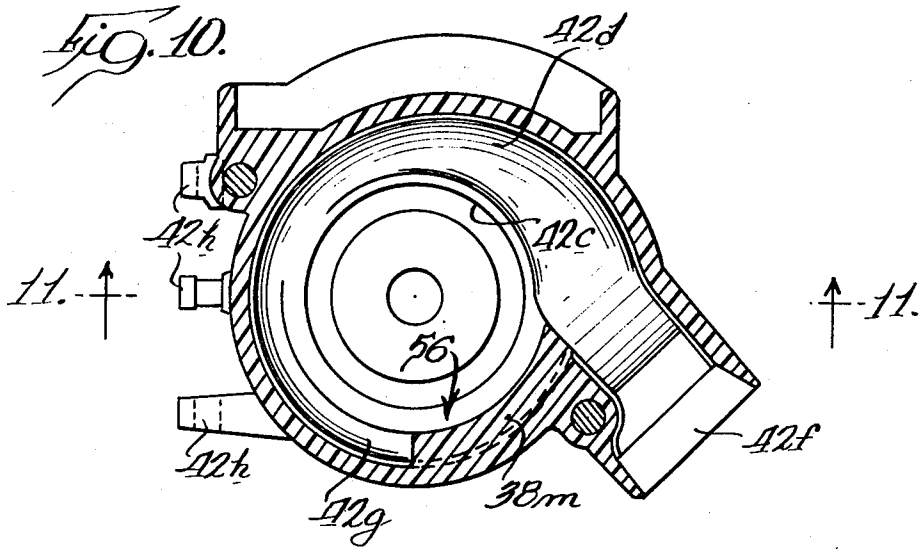
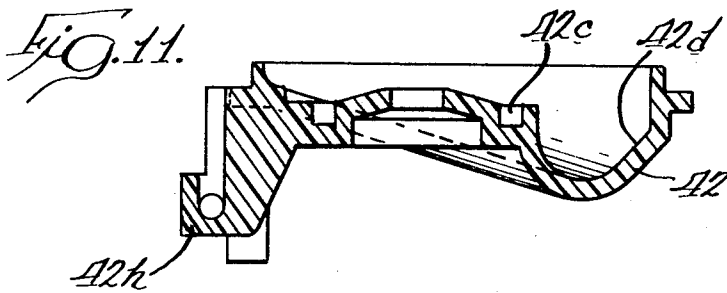
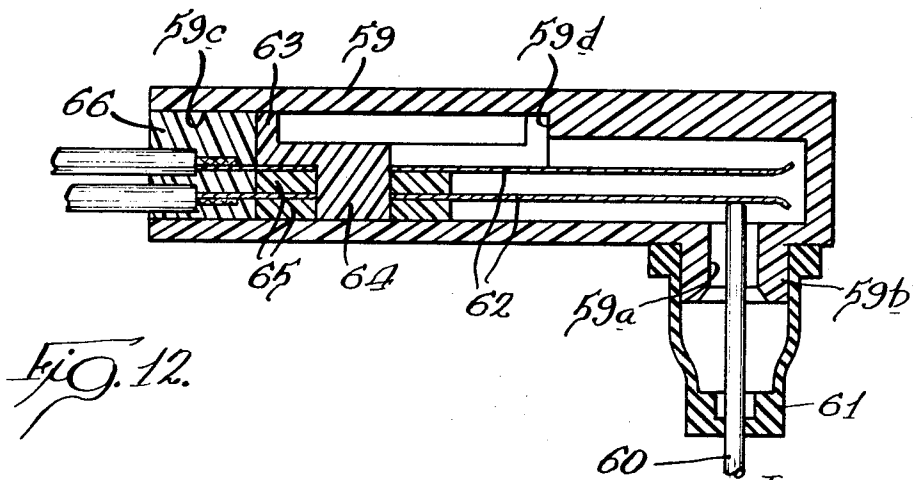


Inventors:
John P. Duve
Stanton H. Petry
By Neil M. Rose.

Att'y



Inventors:
 John P. Duve
 Stanton H. Petry
 By Neil M. Rose
 Att'y



Inventors:
John P. Duve
Stanton H. Petry
By

Neil M. Rose

Atty

LATHER MAKING APPARATUS

BACKGROUND OF THE INVENTION

The invention is concerned with lather making apparatus which is adapted to automatically produce lather utilizing conventional bar or cake soap. The lather is suited for use either in connection with shaving or for general washing purposes as in washing the hands and face. In order to produce the lather, it is necessary to engage the bar of soap with mechanical means for mixing the soap with water and air. In the instant apparatus, a brush is employed as the mechanical means for converting the bar soap into lather. The water combined with the action of the brush against the cake of soap produces a lather for the purposes mentioned above.

Since it is relatively simple to create lather for washing purposes by merely rubbing one's hands against a bar of soap in the presence of water, any appliance which is to be sold successfully to perform this function must be simple, inexpensive, and provide significant functional advantages over the manual methods available. In addition, the appliance must be completely safe to eliminate any hazards which otherwise might be involved in the use of an electrical appliance around water in the bathroom or kitchen.

Examples of prior art lather making machines of this general type are shown in the patents to Wahl U.S. Pat. No. 2,310,378, Wahl U.S. Pat. No. 2,310,379, Rolstad et al. U.S. Pat. No. 2,344,170, and Rolstad No. 2,919,837. All of these patents disclose motor driven lather making devices which utilize cake or bar soap and generate lather in a chamber by rotating a sponge or brush against the soap while in the presence of water. A reservoir is provided to contain the water which is dispensed into the lather generating area at the same time the brush is rotated by the motor. The prior art devices as characterized by these patents were complex structurally and were deficient from functional and safety standpoints.

SUMMARY OF THE INVENTION

The present invention comprises a lather making appliance in which the motor, the lather generating chamber, and the water reservoir have been integrated together to provide a simple, compact, and efficient device for generating a dry lather in a minimum period of time. The bar soap receiving compartment is positioned within the water reservoir which is nested against the lather generating chamber to provide an efficient arrangement wherein the water and soap may be readily dispensed into the lather generating chamber.

The lather generating chamber itself is a generally cylindrical compartment extending horizontally and enclosing a cylindrical brush having the bristles disposed helically. Upon rotation of the brush in engagement with the cake of soap and in the presence of water, lather is generated which is driven toward one end of the cylindrical chamber by the helical configuration or disposition of the bristles. The discharge from the lather generating chamber is positioned above the bottom of the chamber and past the bristles disposed within the chamber. The bottom of the lather generating chamber slopes away from the lather discharge so that any water residue remaining in the chamber after lather generation will tend to accumulate at the end of

the chamber remote from the discharge. Thus, when the device is again started up to produce lather, there will be a generation of lather utilizing the accumulated water, and the water will not be sprayed out the discharge passageway prior to the building up of good quality lather. Similarly, the spacing of the discharge beyond the end of the brush prevents the brush from throwing any water particles out through the lather discharge passage.

The water reservoir is heated by means of a distributed electrical element which is wrapped around the outer wall of the reservoir. An actuating bar which is positioned below the mouth of the discharge passageway permits the user to actuate the appliance with the same hand which is disposed palm upwardly to receive the discharging lather. The actuator is designed to simultaneously open a valve for discharge of water to the lather generating chamber while actuating a sealed switch which closes the motor circuit to rotate the cylindrical brush. The motor is completely encapsulated as are the electrical connections to the cord and to the switch so that there would be no shock hazard if the appliance were inadvertently dropped into the sink or bathtub while being plugged in.

An object of the present invention is to provide improved lather making apparatus which is simple in design and inexpensive to manufacture.

A further object of the present invention is to provide an improved lather generator which will produce quickly a light lather having a minimum amount of moisture contained therein and being warm enough for use in shaving.

An additional object of the present invention is to provide an improved soap lather generator which has sealed electrical components to eliminate or minimize shock hazards.

Still another object of the present invention is to provide lather making apparatus having a generally upright housing within the upper part of which is enclosed a water reservoir with a bar soap receiving passage positioned within the reservoir and a horizontally disposed lather generating chamber extending across the bottom of the reservoir and a motor positioned coaxially with the lather generating chamber to provide a compact arrangement of the components.

A further object of the present invention is to provide lather making apparatus having an upright housing with the water reservoir disposed in the upper portion thereof and a horizontally disposed generating chamber with a motor secured thereto positioned below the reservoir and a soap receiving passageway disposed within the reservoir and extending downwardly into the lather generating chamber with an open bottomed soap carrier being telescopically received within the passageway to support the bar soap and facilitate in its insertion and removal.

Still another object of the present invention is to provide a lather making apparatus having a lather generating chamber which is supported directly on the motor which drives the generating brush positioned within the chamber and wherein water conduit and valve means are formed integrally with said chamber to provide for dispensing water from said water reservoir into said chamber.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a perspective view of the lather making apparatus embodying our invention;

FIG. 2 is a sectional view of the lather making apparatus of FIG. 1 taken substantially on line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken substantially on line 3—3 of FIG. 2;

FIG. 4 is an exploded perspective view of the lather making apparatus showing the housing, the reservoir, the bar soap container, and the lather generating chamber and motor in perspective and in disassembled position;

FIG. 5 is a fragmentary sectional view taken substantially along line 5—5 of FIG. 3;

FIG. 6 is a fragmentary sectional view taken substantially along line 6—6 of FIG. 3;

FIG. 7 is a sectional view taken substantially on line 7—7 of FIG. 5 assuming FIG. 5 shows the complete structure;

FIG. 8 is a top plan view of the lather making apparatus with the cover removed;

FIG. 9 is a front elevational view of the lather generating chamber;

FIG. 10 is a sectional view taken on line 10—10 of FIG. 9;

FIG. 11 is a sectional view taken on line 11—11 of FIG. 10; and

FIG. 12 is a vertical sectional view of the motor switch.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings there is shown in FIG. 1 a perspective view of the lather making apparatus designated generally by reference numeral 11. The apparatus or appliance 11 includes a generally upright housing 12 which is defined by a box-like housing member 13, a rear closure plate 14, and a cover 15. As is best shown in FIG. 4, there is received in the housing member 13 a reservoir assembly 17 and a lather generating assembly 19. The lather generating assembly 19 includes a horizontally disposed generally cylindrical lather generating chamber 20 and a shaded pole induction motor 21.

The housing member 13 is provided with side walls 13a, a front wall 13b, and a pedestal-like base 13c. On the front side of the housing member 13, there is a recess 23 formed by wall portion 13d which curves inwardly and downwardly from the front wall 13b and interconnects to the pedestal base 13c, as is best shown in FIGS. 1 and 2. Positioned within the recess 23 is an actuating lever 24 which is depressed in order to energize the motor 21 and to cause water to flow from the reservoir 17 into the lather generating chamber 20 as will be

more completely described below. The actuating lever 24 consists of two parallel bar portions 24a which extend through openings 13e in the housing member 13 to a point where they are pivotally mounted on the rear of curved wall 13d, as is shown in FIG. 2. The bar portions 24a are interconnected at their ends at the front by a manual push bar 24b and at the rear by a trip bar 24c.

In operating the appliance, the user inserts his hand, palm upwardly, into the recess 23 and exerts a downward pressure on the push bar 24b causing the actuating lever 24 to pivot whereby the trip bar 24c moves upward to cause the lather to be generated. As the lather is generated, it is discharged from a centrally disposed opening 13f which is positioned immediately above the push bar 24b. Thus, the lather is discharged into the palm of the hand which simultaneously operates the actuating lever 24.

To accomplish the pivotal mounting of the actuating lever 24, there are provided integrally molded pivot pins 24d which extend laterally from each of the bar portions 24a of the actuating lever. These pivot pins 24d are received in slotted trunnions 13g which face rearwardly, as shown in FIG. 4, and trunnions 13h which face forwardly. In order to assemble the actuating lever 24 to the housing member 13, the bar portions 24a are inserted from the rear through the openings 13e prior to the assembly of the push bar 24c to the front ends of the bar portions 24a. The openings 13e are wide enough so that the bar portions 24a may be deflected inwardly to snap the outwardly directed pins into the forwardly facing trunnions 13h and seated against the rearwardly facing trunnions 13g. The push bar 24b is then cemented to the front ends of the bar portions 24a thereby providing an actuating lever which is firmly supported on the housing member 13 by means of the engagement of the pivot pins 24d with the trunnions 13g and 13h.

In order to facilitate cleaning up or removing any lather which might spill over from the palm of the hand during the dispensing operation, there is provided a removable tray 26 which is positioned on the pedestal base 13c and defines the bottom of the recess 23 as best shown in FIG. 1. The tray 26 is formed with a slight depression 26a so as to receive and retain any liquid or lather which may be deposited thereon. A small post-like protuberance 26b (see FIG. 2) extending downwardly from the rear edge of tray 26 engages opening 13j in housing member 13 for the purpose of retaining the tray in position with respect to the pedestal base 13c. The tray 26 may be easily removed for cleaning by merely elevating the tray to disengage the post 26b from the opening 13j. This permits the tray to be washed thereby maintaining the neat and sanitary appearance of the apparatus 11 without having to wash or immerse the entire housing 12.

The reservoir assembly 17 is designed to store heated water which may be dispensed into the lather generating chamber 20. As is best shown in FIG. 4, the reservoir assembly 17 includes a box-like tank or reservoir member 28 which is defined by vertically extending side walls 28a which terminate in a peripheral flange or lip 28b which rests within the upper end of the housing member 13, as is best shown in FIGS. 5, 6, and 7. In order to position the reservoir member 28 within the

housing member 13, there are a plurality of inwardly extending stops 13k, as best shown in FIG. 4. The stops 13k engage the underside of the lip or flange 28b on the reservoir member to position the reservoir member vertically with respect to the housing member 13. Wedge-like members 28c on the walls of the reservoir member are formed to engage the stop members 13k and dovetail into engagement with each other. This dovetailed engagement between the stops 13k on the housing member 13 and the wedge-like members 28c increase the rigidity of the assembled housing member and reservoir assembly thus restricting the flexure of the relatively thin plastic walls of the abutting parts. The reservoir assembly is retained in engagement with the housing member by means of hook-like projections 28d, best shown in FIGS. 2 and 4, which snap into engagement with the housing member 13 to prevent upward displacement of the reservoir assembly 17. The rearmost one of the projections 28d hooks beneath a transversely extending wall or rib 13n extending across the upper portion of the back of the housing member 13, as best shown in FIG. 4. The forwarding located projection 28d merely hooks into a recess in the front wall 13b of the housing member 13.

As a means of increasing the rigidity of the reservoir member 28, there is provided a removable wall member 29 shown in FIGS. 4 and 7. The wall member 29 is supported in the reservoir member by means of spaced ribs 28e which receive the wall member 29 when it is inserted from the top. The lower corners of wall member 29 are cut away so that liquid may flow through wall member 29 to either side of the reservoir.

Located within the reservoir member 28 is a vertically extending soap passageway 30 which is defined by transversely extending front and rear walls 31 and 32, respectively, a connecting wall 3, and a second connecting wall 34 which is essentially common with one of the side walls 28a of the reservoir member as is shown in FIGS. 4, 7 and 8. At the lower end of the soap passageway 30, the walls 31, 32, and 33 are connected to the side walls 28a by the bottom wall 28f. This provides a water containing area which is defined by the side walls 28a, the soap passageway walls 31, 32, 33 and the bottom wall 28f. The soap passageway 30 is completely enclosed by the water containing portion of the reservoir except, of course, at the wall 34 which is common with one of the side walls 28a.

The soap passageway 30 is made of sufficient cross section and length to accommodate any conventional bath size bar or cake soap. In order to facilitate insertion and removal of the soap as well as to permit utilization of smaller pieces and chips of bar soap, a soap basket 35 is utilized. The soap basket, as shown in FIGS. 2, 4, and 8, has side walls 35a and a lifting ledge 35b. The cross section of the basket 35, as defined by the side walls 35a, is such as to be snugly received within the passageway 30, as shown in FIGS. 2, 5, and 7. When the basket is received within the soap passageway 30, the lower edges of the side walls 35a engage the lather generating assembly 19 with the upper edges of the basket substantially flush with the flange 28b on the reservoir member. The lifting ledge 35b extends laterally of the side walls 35a and permits the user to lift the basket 35 out of the passageway 30 to remove soap or for cleaning purposes.

To provide means for supporting soap in proper position for engagement by the lather generating means, the soap basket 35 is formed with a series of spaced ribs 35c which extend across the shorter dimension of the passageway formed within the side walls 35a. The ribs 35c, as shown in FIG. 2, are curved for reasons which will be more completely described below.

In order to heat the water contained within the reservoir member 28, an electrically energized, distributed heater 36 is secured against the side walls 28a of the reservoir member as shown in FIGS. 3 and 4. The heater 36 consists of printed or impregnated carbon on an asbestos back. The carbon and asbestos is then sandwiched between mylar and polyethylene to provide a sheet which may be energized at sealed terminals 37 to heat the contents of the reservoir member 28. The heater 36 in the disclosed embodiment extends around three side walls of the reservoir member 28 and may be secured to the side walls by means of any suitable adhesive and/or clips 27 (see FIGS. 3 and 6).

Positioned immediately beneath the reservoir member 28 within the housing 12 is the lather generating assembly 19 which is best shown in FIG. 4. The lather generating chamber 20 is formed by a cylindrical enclosure 38 within which is received a cylindrical brush member 39. The end of chamber 20 most remote from motor 21 is closed by means of a cap 40 which is secured within the opening 38a to seal the opening against leakage and which has a recess 40a to receive the free end of the brush member 39. The outer wall of the cap 40 is formed with a wall 40b which is received in a slot 13m on housing member 13 to aid in locating and supporting the lather generating assembly 19 with respect to the housing 12. The cap 40 is assembled to enclosure 38 by means of screws 41, as shown in FIG. 6.

At the other end of enclosure 38, there is provided a frame member 42 which serves to interconnect the motor 21 and the chamber 20 and, in addition, serves as a closure for the circular opening 38b formed at that end of the enclosure 38. The frame member 42 is formed with a cylindrical boss 42a shown in FIG. 7 which extends toward the motor 21 and engages the motor field. Similarly, another molded projection 42b shown in FIG. 4 extends into engagement with the motor field. Both of these projections 42a and 42b threadedly receive assembly screws 43 which extend through the field of motor 21 to the frame member 42.

The brush member 39 includes a cylindrical hub portion 44 which is supported on a shaft 45 which, in turn, is coupled to the motor 21. In order to minimize leakage in the area where the shaft 45 extends through the frame member 42 into the enclosure 38, the hub portion 44 is formed with a conical skirt 44a (FIG. 7) which terminates in a rim 44b which, in turn, is received in an annular groove 42c formed in the inner face of the frame member 42. The skirt 44a, the rim 44b, and the cooperating groove 42c form a baffling arrangement which tends to prevent the lather generated in the enclosure 38 from leaking outwardly along the shaft 45.

The brush member 39 includes a double helix of bristles 46 which extend outwardly terminating at the side walls of the enclosure 38. At the upper portion of the enclosure 38, there is provided a rectangular opening

38c (FIG. 4) into which the lower end of the soap basket 35 extends. Shoulders within the opening 38c receive and support the lower ends of the side walls 35a. This positions the soap supported on the ribs 35c within the opening 38c of the lather generating chamber. The bristles 46 are made of sufficient length that they extend between the ribs 35c into engagement with the soap supported thereon as shown in FIG. 2. Thus, as the motor 21 rotates the brush member 39 within the enclosure 38, the bristles 46 engage the soap and tend to break away portions thereof which, when combined with water and air, produce lather.

In order to supply water from the reservoir member 28 into the enclosure 38, there is formed a valve 48 which is formed in part by the reservoir member 28 and in part by the cylindrical enclosure 38. As is best shown in FIGS. 4 and 5, the reservoir member 28 is formed with a cylindrical extension 28g in the corner of the bottom wall thereof. Within the cylindrical extension 28g, there is a threaded valve opening 28h into which a control or metering member 49 is threadedly received. The metering member 49 has a slotted head 49a (FIGS. 5 and 8) which permits the member to be adjustably positioned with respect to the threaded opening 28h. The lower end of the metering member 49 is formed with a tapered slot 49b (FIG. 5). The amount of threaded engagement between the metering member 49 and the opening 28h determines the rate of flow of liquid from the reservoir member 28 into the enclosure 38. By adjustment of the member 49, the composition of the lather may be varied from wet to dry depending on the rate of water flow to the enclosure 38.

For the purpose of initiating or terminating the flow through the opening 28h, the valve 48 is further provided with a reciprocating valve member 50 which is mounted for vertical sliding movement within a hole 38d formed in a cylindrical boss 38e which extends from the rear wall of the enclosure 38 (FIGS. 4 and 5). The upper end of the cylindrical boss 38e receives the downwardly depending extension 28g to form the valve housing 51. The valve member 50 is formed with an enlarged sealing portion 50a which is spring biased by spring 52 into engagement with valve seat 53. Integrally formed with the enclosure 38 is a horizontally extending passageway 38f which connects with the hole 38d to permit water to flow from the valve housing 51 into the interior of the enclosure 38. At the bottom of the cylindrical boss 38e, there is provided a flexible rubber boot 54 which is sealed to the lower end of the boss 38e and receives the lower end of the valve member 50. As is noted from FIG. 5, the boot 54 rests against the trip bar 24c of the actuating lever 24 so that upon depression of the push bar 24b the valve member 50 is raised thereby permitting water to flow through the valve housing 51 through opening 38f and into the cylindrical interior of the enclosure 38.

As water, soap, and air combine to produce lather within the enclosure 38, brush member 39 is rotated in the direction shown by the arrow in FIG. 7 (counterclockwise as seen in FIGS. 2 and 5) so that the helical arrangement of the bristles 46 causes the lather to move from right to left, as viewed in FIG. 7. The frame member 42 is formed with an annular passageway or channel 42d which commences at a point toward the rear of the enclosure 38 adjacent the projection 42b

and gradually increases in depth until its maximum depth which is toward the front of the housing at a level corresponding to the axis of shaft 45 (FIG. 11). FIG. 11, which is a sectional view through the frame member 42 taken along line 11—11 of FIG. 10, illustrates clearly the manner in which the channel 42d increases in depth toward the forward part of the lather generating chamber. As the lather is urged toward the frame member 42 by the helically disposed bristles 46, the lather enters the channel 42d and moves forwardly past the front wall of the cylindrical enclosure 38, as is evident from FIG. 10. At that point, the channel terminates at a sloping wall 42e which urges the lather back toward the front wall of the enclosure 38 where it is directed forwardly and downwardly by the wall of the discharge chute 55. The chute 55 is formed by side wall 38g, top wall 38h, and bottom wall 38j formed integrally with the enclosure 38 (FIG. 9) and also with side wall 42f formed integrally with the frame member 42. Thus, it should be understood that the lather moves lengthwise along the brush member 39 towards the motor while it is being formed and upon reaching the end of the cylindrical lather generating chamber it is carried forwardly by the channel 42d formed on frame member 42 and then caused to reverse direction and move along the outside of the foam generating chamber and forwardly through the discharge chute 55. As is evident from FIG. 2, the discharge chute 55 is in alignment with the discharge passage 13f so that the lather will leave the housing 12 at this point and be deposited within the palm of the user.

In connection with the generation of lather within chamber 20, it should be noted that the enclosure 38 is formed with lengthwise extending ribs 38k, as shown in FIGS. 2 and 7. These ribs tend to create an interference with the bristles 46 thereby cooperating with the soap and water to whip up lather in a more efficient manner. In addition, the ribs 38k cooperate with the helical configuration of the brush and thereby tend to urge the lather toward the channel 42d and the discharge chute 55.

Positioned at the bottom of the lather generating chamber 20 and adjacent the end toward the motor 21 is an abutment 56 which is formed in part by a shoulder 38m (FIG. 10) and a mating abutment 42g extending inwardly from the frame member 42. The abutment 56 extends inwardly from the end of enclosure 38 only about three-sixteenths of an inch and is intended to engage the endmost bristles 46 and prevent these bristles from throwing water particles out through the discharge chute 55. The portion 42g of the abutment 56 slopes gradually and merges into the channel 42d.

To connect the apparatus 11 to a source of electrical power, there is provided a conventional power cord 57. One side of the power cord 57 is connected to both the motor 21 and to one terminal 37 of the heater 36. The other side of the power cord 57 is connected to the other heater terminal 37 and to the motor 21 through a switch 58 which is secured to the bottom 28f of the reservoir assembly 28 in the position shown in FIG. 3. As illustrated in detail in section in FIG. 12, the switch 58 is a simple, two pole switch which is enclosed within a molded plastic box 59 having an opening 59a through which an operating plunger 60 extends. In order to seal the switch against the entrance of moisture, a rubber

boot 61 is provided. The boot tightly grips the switch actuating plunger 60. Two resilient switch members 62 are mounted within the box 59 by means of a bridge support 63 having a rectangular locating portion 64 which extends through corresponding openings in the resilient switch members 62. Resilient plastic spacers 65 are also received on the locating portion 64 to maintain the switch members 62 spaced from each other and located within the switch housing 59. When the bridge support 63 is inserted through opening 59c in the switch housing 59 with the switch members 62 and spacers 65 assembled thereto, it may be slid inwardly until the bridge support 63 engages a shoulder or step 59d. This limits the inward insertion of the assembly including the switch members and the bridge support. A quantity of room temperature vulcanizing silicone rubber 66 is deposited into the opening 59c to complete the sealing of the switch housing 59 and to retain the parts against disassembly therefrom. This provides a simple, compact water sealed switch which is closed upon upward movement of the actuating plunger 60.

In order to guide the actuating plunger 60 for vertical sliding movement, the frame member 42 is formed with slotted projections 42h, as best shown in FIG. 4. These slotted or hook-shaped projections receive the plunger 60 and guide it in its vertical reciprocating movement. As positioned in sliding engagement with the projections 42h, the lower end of the plunger 60 rests against the trip bar 24c, as shown in FIG. 3. Thus, when the exposed push bar 24b is urged downwardly by the user, the switch actuating plunger 60 moves upwardly closing the switch 58 and thereby connecting the motor 21 across the power supply. At the same time the trip bar 24c operates the switch 58, it also opens the valve 48 allowing water to flow downwardly into the lather generating chamber 20 where it is agitated together with the soap by the brush member 39 thereby producing lather.

To avoid any possibility of the actuating lever inadvertently operating the valve 48 or the switch 58, there is provided a leaf spring 67 (FIG. 2) which is supported at one end in a recess in housing member 13 while the unsupported end engages the central portion of the trip bar 24c. When hand pressure is applied to the push bar 24b, the actuating lever 24 is readily pivoted overcoming the biasing function of the spring 57 and actuating the valve 48 and the switch 58.

The lather generating assembly 19 is supported upon the housing member 13 by means of an L-shaped stamped frame 69 (FIG. 4) which is screwed to the face of the motor field 21 on the side opposite from the enclosure 38. The frame 69 has a front mounting tab 70 which is secured by screws to the front wall 13b of the housing. The frame 69 is formed with a locating support 71 which is received in slot 72 formed in the pedestal or base 13c of the housing. As was previously indicated, the end of the lather generating assembly 19 remote from the motor includes a locating wall 40b which is received shortly between the walls 13m on the housing member 13 to locate the lather generator assembly 19.

The reservoir assembly 17 is formed so that the soap passageway 30 formed therein has the lower edges of its walls 31, 32, 33, and 34 positioned to be received

within the slot 74 which faces upwardly and extends around the opening 38c formed in the top of the lather generating chamber 20 (FIGS. 2, 4, 5 and 7). Since the lather within the enclosure 38 has no tendency to leak out between the junction involving the cylindrical enclosure 38 and the reservoir member 28, there is no need to provide a liquid seal in the slot or channel 74. The only seal necessary between the reservoir assembly 17 and the enclosure 38 is within the valve housing 51. A suitable sealing cement is employed to prevent leakage between the cylindrical extension 28g and the recessed interior of the cylindrical boss 38e. The assembly of the reservoir 17 and the lather generating assembly 19 to the housing member 13 is such that there are no critical dimensions with respect to the fit of the parts. The housing member 13 provides the structural support for the assemblies 17 and 19 with the only interengagement being between the slot 74 and the lower edge of the reservoir assembly 17 as well as in the area of the valve housing 51. This provides a rigid and easily assembled unit wherein the lather generating assembly 19 is simply secured in the housing member 13 by screws in the mounting tab 70, and the reservoir assembly 14 is dropped in from the top with the hook-like projections 28d locking the reservoir member to the housing member 13.

The housing 12 is formed by the housing member 13 and the rear closure plate 14 which closure plate also serves to hold the lather generating assembly 19 rigidly within the housing 12. The upper edge of the closure plate 14 is formed with an inwardly stepped ledge or edge 14a which extends under the transverse wall 13n (FIG. 5). The ledge 14a is interrupted to provide clearance for the stops 13k, the wedge-like members 28c, and the projections 28d. The lower end of the closure member 14 is formed with an opening 14b which provides access to a cord storage chamber 76. An inwardly directed wall 14c formed integrally with the closure plate 14 forms the top of the chamber 76 and prevents the cord stored therein from becoming tangled with the actuating lever 24.

For the purpose of retaining the supporting wall 40b on the lather generating assembly 19 seated within the slot 13m, the closure plate 14 is formed with an inward projection 14d, as is best shown in FIG. 6. The projection 14d engages the wall 40b and wedges it into seated engagement against the cooperating portions of the housing member 13. Also to aid in maintaining the lather generating assembly 19 seated against the housing member 13, the frame 69 is formed with a rearward projection 77 shown in FIGS. 3 and 4. The projection 77 engages the closure plate 14 thereby urging the frame 69 and the associated support 71 into seated engagement with the slot 72. To increase the rigidity of the assembly, a channel-shaped projection 14e, shown only in section in FIG. 3, extends forwardly from the closure plate 14 to receive the projection 77. Assembly screws 78 extend through the lower edges of the closure plate 14 to retain it in position with respect to the housing member 13. To provide further rigidity between the housing 12 and the lather generating assembly 19, the frame 69 is provided with a rear support tab 79 which has a pair of threaded openings formed therein. Suitable assembly screws 80 extend through openings in the closure plate 14 into threaded engagement with the rear support tab 79.

For the purpose of closing the top of the housing 12, the cover 15 is received in position resting on the housing member 13. A peripheral flange 15a (see FIG. 2) disposed inwardly of the edge of the cover 15, extends downwardly within the housing member 13, and assures proper positioning and registry of the cover 15 with respect to the housing 12. An inwardly positioned downwardly directed U-shaped flange or wall 81 on the cover 15 surrounds the soap passageway 30. The purpose of this flange 81 is to prevent the heated water within the reservoir member 28 from condensing within the soap passageway 30 where it would tend to soften or liquefy the soap in an undesirable manner. The cover 15 may, of course, be readily removed to add water to the reservoir member 28 or to remove the soap basket 35 to replenish the soap supply therein.

In operating the apparatus 11, the cord 57 is connected to a suitable source of power and water is added to the reservoir member 28. The low wattage heater 36 causes the water contained in the reservoir to be heated up to a temperature of approximately 100° F. When lather is required, the user simply depresses the actuating lever 24 with the palm facing upwardly beneath the discharge passage 13f. Upon depression of the lever 24, the valve member 50 is forced upwardly as is the switch actuating plunger 60. The actuation of switch 58 causes the motor 21 to rotate the brush 46 in engagement with the soap positioned within the basket 35. At the same time water is discharged through the passageway 38f into the enclosure 38 where it is picked up by the bristles 46 thereby producing lather. The lather generated therein is urged to the end of the enclosure 38 where it enters the channel 42d and from there passes into the discharge chute 55 and out of the housing through the passage 13f. These functions of the apparatus are performed rapidly so that the user is provided with hot, creamy lather within a matter of a few seconds.

The motor 21 is a shaded pole induction motor having a completely encapsulated field coil 82. By encapsulating the field coil 82, the switch 58 and the heater 36 as well as the lead connections between these portions of the apparatus, there is provided a completely safe and sealed electrical circuit which may be immersed in water without any risk of shock or electrocution.

Because of the space limitations in the conventional bathroom, the compact arrangement of the parts in the lather making apparatus 11 is extremely important. The positioning of the soap passageway 30 within the reservoir member 28 and the nesting of the lather generating assembly 19 immediately below the reservoir assembly 17 provides the most efficient and compact organization of the elements of the apparatus. The lather generator 20 with its enclosure 38 is designed to fit into this compact arrangement with the motor 21 supported at one end thereof and the valve 48 formed integrally with portions of both the reservoir member 28 and the enclosure 38. The bottom wall of the enclosure 38 is angled slightly downwardly away from the discharge provided by the frame member 42 so that any water which might accumulate or result from lather remaining in the enclosure 38 when the motor 21 is deenergized will tend to drain to the end of the enclosure remote from the discharge. Thus, when the apparatus is started up again, there will be no tendency for water rather than lather being discharged through

the passage 13f. In addition, the abutment 56 formed at the bottom edge of the enclosure 38 adjacent the discharge end of the generator 20 tends to provide an obstruction against the bristles 46 throwing water or liquid out through the discharge passage. The configuration of the generator 20 is, therefore, such that only satisfactory lather is produced therein.

While there has been shown and described a particular embodiment of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the invention in its broader aspects, and it is, therefore, contemplated in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A lather making appliance comprising a housing supporting a water reservoir assembly in the upper portion thereof and a lather generating assembly in the lower portion thereof, said reservoir being formed with a soap passageway open at the top of said housing and extending vertically through said reservoir into said generating assembly, said generating assembly including an elongated horizontally extending cylindrical enclosure having a motor at one end drivingly connected to a cylindrical brush positioned within said enclosure, said brush having bristles disposed in a helical row to cause lather generated in said enclosure to move axially therein for discharge through an opening at one end thereof, valve means controlling the flow of water from said reservoir into the other end of said enclosure, said enclosure having a bottom wall which is angled downwardly away from said discharge opening to drain water residue away from the discharge end of said enclosure and said discharge opening being spaced above said bottom wall whereby water residue in said enclosure after a period of non-use will be combined with soap to produce lather when said motor is energized.

2. A lather making appliance comprising a housing supporting a water reservoir assembly in the upper portion thereof and a lather generating assembly in the lower portion thereof, said reservoir being formed with a soap passageway open at the top of said housing and extending vertically through said reservoir into said generating assembly, said generating assembly including an elongated horizontally extending cylindrical enclosure having a motor at one end drivingly connected to a cylindrical brush positioned within said enclosure, said brush having bristles disposed in a helical row to cause lather generated in said enclosure to move axially therein for discharge through an opening at one end thereof, valve means controlling the flow of water from said reservoir into the other end of said enclosure, said enclosure having a bottom wall which is angled downwardly away from said discharge opening to drain water residue away from the discharge end of said enclosure, said enclosure includes a frame member closing said one end thereof, and internally facing volute channel of increasing depth formed in said frame member, said channel extending beyond said one end of said cylindrical enclosure to discharge lather formed therein, the bristles on said brush terminating short of said channel.

3. A lather making appliance comprising a housing supporting a water reservoir assembly in the upper portion thereof and a lather generating assembly in the lower portion thereof, said reservoir being formed with a soap passageway open at the top of said housing and extending vertically through said reservoir into said generating assembly, said generating assembly including an elongated horizontally extending cylindrical enclosure having a motor at one end drivingly connected to a cylindrical brush positioned within said enclosure, said brush having bristles disposed in a helical row to cause lather generated in said enclosure to move axially therein for discharge through an opening at one end thereof, valve means controlling the flow of water from said reservoir into the other end of said enclosure, said enclosure having a bottom wall which is angled downwardly away from said discharge opening to drain water residue away from the discharge end of said enclosure, said enclosure includes a frame member closing said one end thereof, an annular abutment formed in said enclosure at said frame member to engage the end bristles on said brush to inhibit said bristles from throwing water out through said opening.

4. The lather making apparatus of claim 3 having an elongated basket for supporting soap bar within said soap passageway, said basket being telescopically received in said soap passageway and being open at one end and having spaced soap supporting ribs at the other end, said ribs conforming to the cylindrical contour of said brush to support soap in slight interferring engagement with said brush.

5. In a lather making appliance of the type in which a rotary brush engages a bar of soap in the presence of water to generate lather, the combination comprising a water reservoir connected to supply water to a foam generator, said generator including a motor driven cylindrical brush, a soap delivery soap passageway extending into said generator normal to the axis of said brush, a soap supporting basket telescopically received within said soap passageway, soap supporting ribs in said basket curved to conform to the outer periphery of said brush, the bristles of said brush extending a small amount into said basket and beyond said supporting ribs to have an interferring engagement with said soap.

6. The combination of claim 5 wherein said generator includes a cylindrical enclosure having said brush mounted coaxially therein and having ribs extending parallel to the axis of said enclosure to engage in the ends of said bristles and aid in the generation of lather, said supporting ribs on said basket extending transversely with respect to the axis of said enclosure.

7. The combination of claim 6 including valve means to control the flow of water from said water reservoir to one end of said enclosure and the other end of said enclosure is formed with a lather discharge opening located above the bottom of said enclosure and beyond the end of the bristles on said brush, and means for simultaneously rotating said brush and opening said valve means to supply water to said enclosure.

8. The combination of claim 7 including a heater for heating the water in said reservoir, said motor having a sealed switch which is adapted to be closed simultaneously with the opening of said valve means, said motor being an induction motor with encapsulated and sealed field, said heater and all the electrical connections

being sealed against moisture so that the appliance may be immersed in water without risk of electrical shock.

9. A lather making appliance comprising a water reservoir, a lather generating chamber arranged to receive water from said reservoir, a motor drivingly connected to a cylindrical brush positioned within said generating chamber, a soap passageway communicating with said chamber to permit a bar of soap to be fed into said chamber for engagement with said brush, said generating chamber being formed by a cylindrical enclosure having transverse walls at either end thereof, one said wall being formed with an internally facing volute channel of increasing cross section which at its deepest point extends beyond the cylindrical wall of the enclosure, said brush having bristles arranged in a helical pattern to transport lather formed in said enclosure toward said one wall and into said channel, a discharge passageway connected to the channel portions extending beyond said cylindrical wall of the enclosure, said discharge passageway being of increasing cross sectional area moving from said enclosure to eliminate any restriction to the discharge of lather.

10. The lather making appliance of claim 9 wherein said motor includes a shaft extending through said one wall into supporting engagement with said brush, said brush having a flared skirt which is positioned in closely spaced relation to said one wall and cooperates with said one wall to provide baffling to prevent leakage around said shaft.

11. The lather making appliance of claim 9 wherein said enclosure is provided with a top opening through which said soap passageway extends, said opening being of a width substantially equal to the diameter of said enclosure and of a length substantially equal to the length of said enclosure, said brush being coextensive with said top opening and said bristles extending into said soap passageway to engage said bar soap.

12. The lather making appliance of claim 9 having a soap basket telescopically received in said soap passageway, said basket comprising a tubular member open at the upper end and having spaced arcuate ribs extending across the lower end to support the bar soap thereon, said ribs having substantially the same curvature as the surface defined by the tips of the bristles, said bristles extending between said ribs into engagement with said soap.

13. The lather making appliance of claim 9 wherein said soap passageway is defined by walls extending vertically within said water reservoir, said water containing portions being between the outer walls of said reservoir and the walls defining said soap passageway, a flat distributed heater secured to and overlying a substantial portion of the outer walls of said reservoir, and valved conduit means formed in part by said reservoir and in part by said chamber for providing controlled water flow from said reservoir to said chamber.

14. The lather making appliance of claim 13 wherein said valved conduit means includes a threaded inlet opening at the bottom of said reservoir, a water flow control threadedly received in said opening and having an operating portion extending to the top of said reservoir.

15. A lather generating apparatus comprising an open water reservoir having side walls and a bottom wall, a lather generator comprising a horizontal elon-

15

gated cylindrical enclosure having a motor at one end drivingly connected to a cylindrical brush positioned within said enclosure, said reservoir and generator being supported in a housing with said reservoir nested above said generator, projecting portions of said reservoir and generator forming a valve housing, integrally formed openings in said reservoir and said generator to provide for water flow from said reservoir to said valve housing and from said valve housing to said enclosure, a movable valve member engageable with a valve seat to obstruct flow through said valve housing, said valve member having an operating portion extending outwardly from said valve housing with a rubber boot engaging said operating portion and said generator to prevent leakage from said valve housing, a switch for operating said motor, and manually controlled means for simultaneously closing said switch and moving said valve member operating portion and boot to a position to permit water flow through said valve housing.

16. The lather generating apparatus of claim 15 wherein said switch is supported on the bottom wall of said reservoir, said enclosure being provided with a discharge means on the forward portion of said housing to discharge lather, said valve housing being at one corner of said reservoir and said switch being at another corner, said switch comprising a sealed enclosure having two spaced contacts and an operating rod for closing said contacts, said operating rod extending downwardly in spaced parallel relation to said valve operating member, said manually controlled means including a pivotally mounted lever having a trip portion at its inner rear end in engagement with said operating rod and said boot engaging said operating portion and a forward portion outside of said housing and positioned beneath said discharge means.

17. The lather generating apparatus of claim 15 wherein said manually controlled means comprises a lever pivotally mounted on trunnion means formed on said housing and said lever, said housing having a front wall provided with a recess formed therein, a lather discharge duct being positioned in said front wall above

16

said recess and connected by a passageway to discharge lather produced in said enclosure, said lever having an actuating bar positioned within said recess below said discharge, depression of said actuating bar causing said lever to close said switch and move said valve member to said position to permit water flow.

18. A lather making appliance comprising an upright housing enclosing a water reservoir and a lather generator, said reservoir being positioned at the top of the housing and having an open top whereby it may be filled with water, a soap bar delivery passageway formed within said reservoir and extending vertically through the water receiving portions thereof, said generator including an elongated cylindrical enclosure having a motor mounted at one end in driving connection with a cylindrical brush within said enclosure, said generator being secured against the bottom of said reservoir with valved conduit means for supplying water from said reservoir to said enclosure and said soap passageway opening into said enclosure, a forwardly facing recess in the front wall of said housing extending beneath said enclosure, a lather discharge duct extending from said enclosure and opening through said front wall above said recess, and control means in said recess whereby a user inserts a hand into said recess to actuate the lather generator and to receive lather in said hand.

19. The lather making appliance of claim 18 wherein the upright walls of said housing are positioned closely adjacent the walls of said reservoir and said enclosure to minimize the space occupied by said appliance, said control means including a lever pivoted on the rear wall of said recess and extending into said housing, said lever being positioned below said lather generator.

20. The lather making appliance of claim 19 wherein said motor is controlled by a switch mounted on the bottom of said reservoir, said valved conduit means including a valve having an actuating member extending downwardly into engagement with said lever, and said switch including an actuating member extending downwardly into engagement with said lever.

* * * * *

45

50

55

60

65