

Feb. 16, 1960

E. S. STEVENS

2,925,202

LATHER MAKING MACHINE

Filed May 13, 1957

3 Sheets-Sheet 1

Fig. 1.

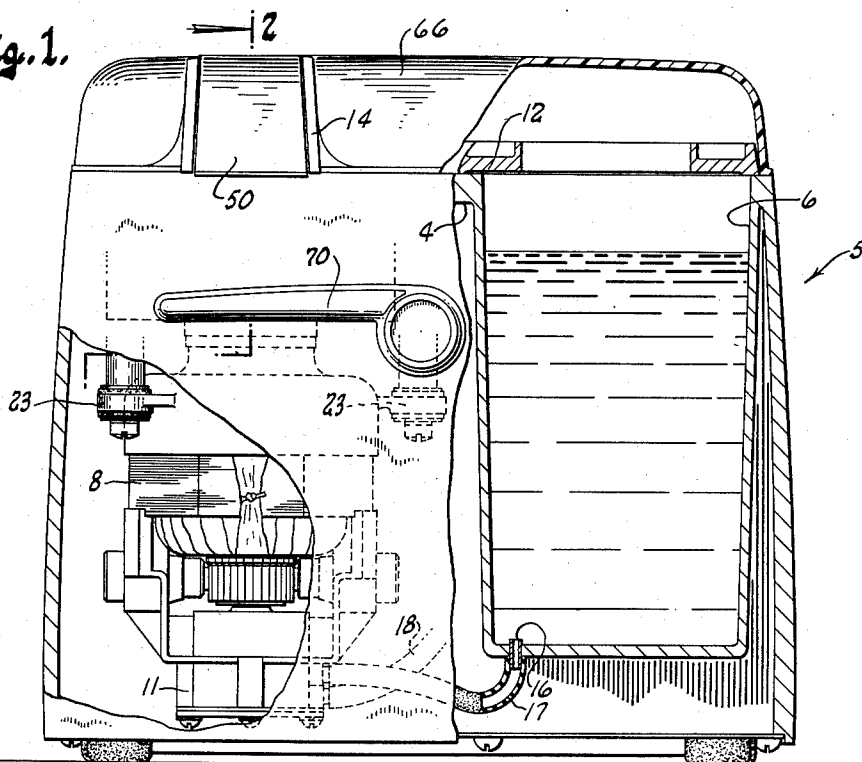


Fig. 2.

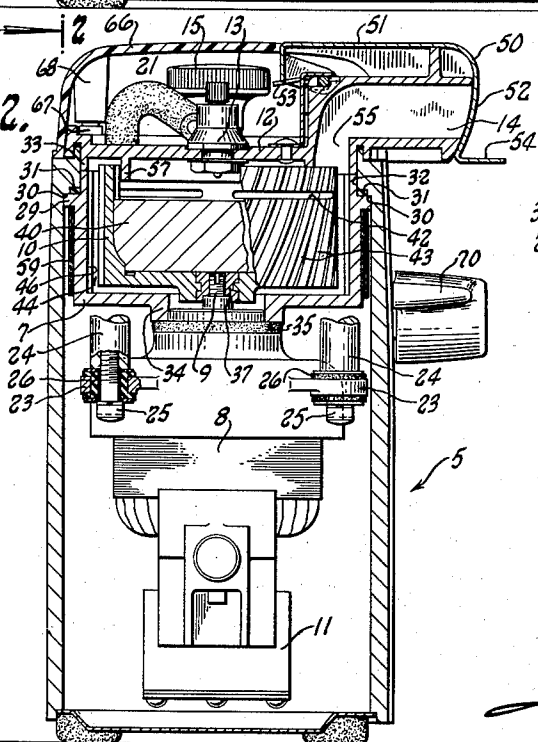
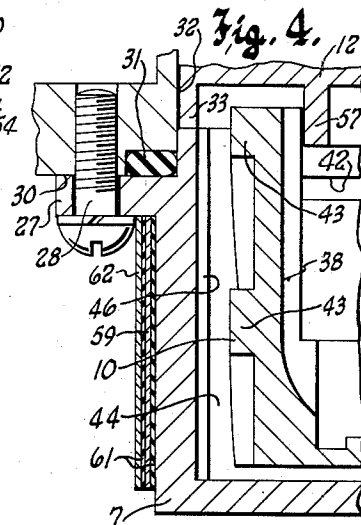


Fig. 4.



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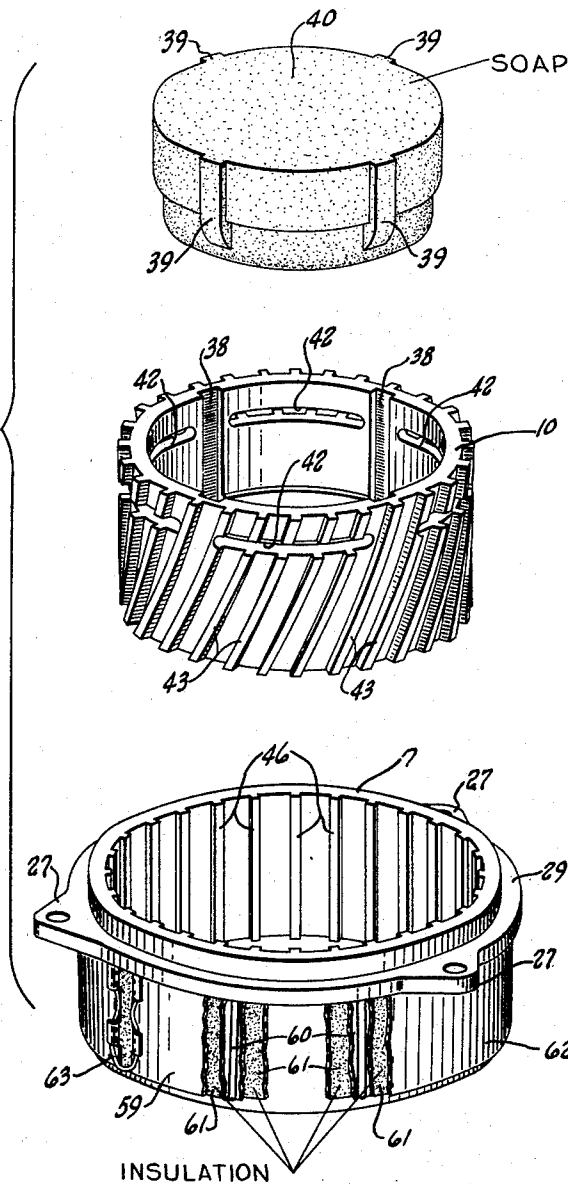
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Fig. 3.



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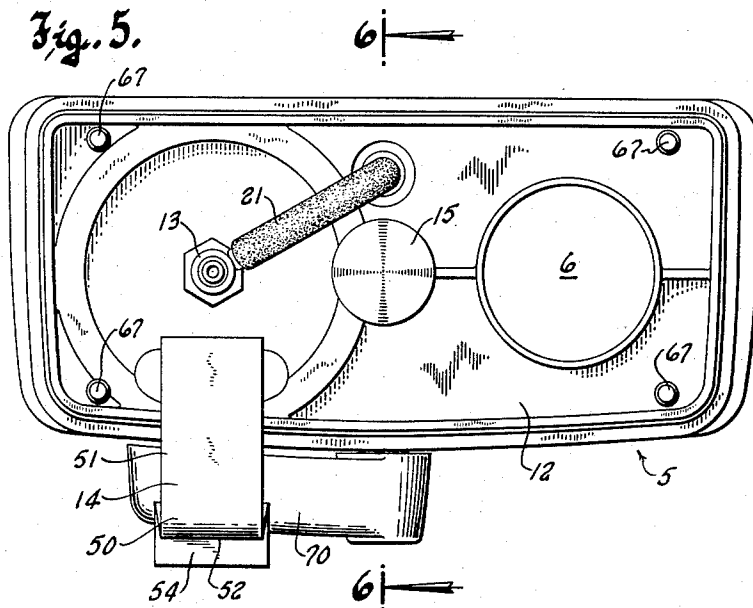
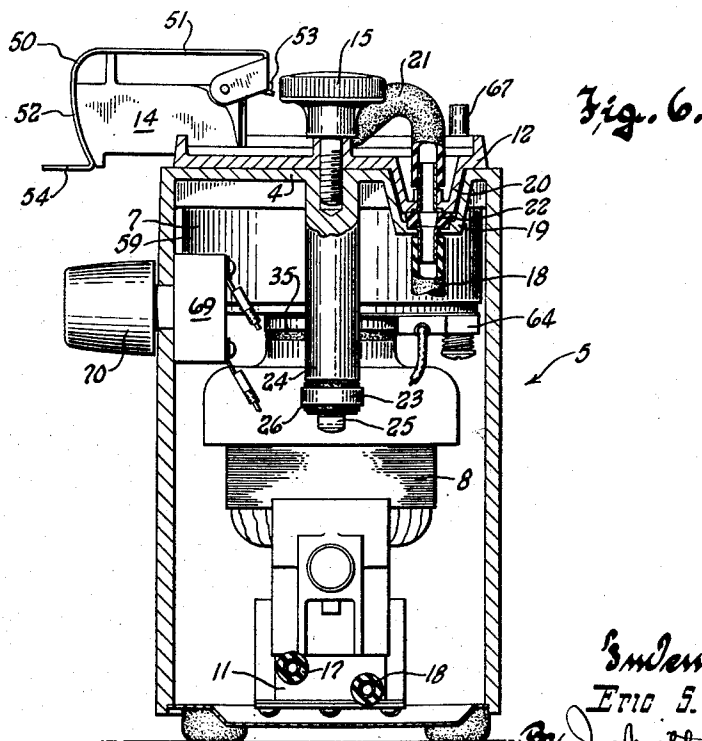
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2,925,202

LATHER MAKING MACHINE

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Application May 13, 1957, Serial No. 658,807

5 Claims. (Cl. 222—190)

This invention relates to lather making machines in which shaving lather may be made from bar soap, and refers more particularly to improvements in lather making machines of the kind disclosed in the patent to Johnson et al., No. 2,610,090, issued September 9, 1952.

In general, a lather making machine of the type here under consideration has a substantially cylindrical chamber with a cup-shaped soap holder concentrically mounted therein for rotation on an upright axis. The outer surface of the side wall of the soap holder is ridged or corrugated to provide a lather agitator, and it cooperates with the concentric cylindrical wall of the chamber to define an annular lather agitating chamber. When the machine is in operation, water is directed downwardly into the soap holder from a water inlet at the top of the chamber, and the soap holder is rotated at high speed. The water strikes the upper surface of a cake of soap in the soap holder and is deflected radially outwardly over the soap, forming a soap solution which enters the lather agitating chamber, where the ridged side wall of the rotating soap holder whips or agitates it into a lather.

While the machine of the aforesaid Johnson et al. patent has been found capable of producing lather, difficulties have been experienced with it in obtaining consistent production of good quality lather and in effecting expulsion of lather from the cylindrical chamber.

It is therefore an object of the present invention to provide an improved lather making machine of the character described wherein lather may be generated from water and cake soap, which machine does not rely upon brushes or other soap-engaging frictional devices, but is nevertheless capable of consistently producing a uniform and satisfactory lather and expelling it continuously at a steady rate.

Another object of this invention resides in the provision of a lather making machine of the character described wherein the lather outlet is located a substantial distance above the lather agitating or whipping chamber and wherein the structure of the machine is such that unfrothed soap solution cannot be expelled from the machine along with the lather, and wherein the lather agitator not only produces lather of the desired quality but also serves as a pump to elevate the lather from the lather agitating or whipping chamber upwardly to and out of the lather outlet.

It is also an object of this invention to provide, in a lather making machine of the character described, novel and very effective means for warming the lather produced by the machine.

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.

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The accompanying drawings illustrate 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:

Figure 1 is a front elevational view of the lather making machine of this invention with portions shown broken away to illustrate detail;

Figure 2 is a sectional view taken along the line 2—2 in Figure 1;

Figure 3 is a group perspective view of the lathering chamber and soap holder of the machine of this invention, together with a cake of soap adapted for use therewith;

Figure 4 is a fragmentary vertical sectional view through the lathering chamber and soap holder;

Figure 5 is a top view of the lathering machine with the cover or cap removed therefrom; and

Figure 6 is a vertical sectional view taken on the plane of the line 6—6 in Figure 5.

Referring now to the accompanying drawings, in which like numerals designate like parts throughout the several views, the numeral 5 designates generally the housing body of a lather making machine of this invention which may be formed as a unitary casting and which has a water storage reservoir 6 in one side thereof. Enclosed in the other side of the housing body is a mechanism by which generation of lather is effected and which comprises, in general, a substantially cylindrical vessel 7 stationarily mounted near the top of the housing body, an electric motor 8 mounted beneath the vessel and having its shaft 9 projecting coaxially upwardly thereinto, a cup-shaped soap holder 10 coaxially mounted in the vessel on the upper portion of the motor shaft to be rotated by the motor, and a water pump 11 mounted beneath the motor and drivingly connected with the lower end portion of the motor shaft. Cooperating with the housing body is a removable cover 12 incorporating a water inlet fitting 13 through which water may be injected downwardly into the soap holder, substantially coaxially thereof, and a forwardly projecting lather outlet spout 14 communicated with the upper portion of the vessel 7 and through which lather may be expelled to the outside of the machine. The top cover 12 is readily removably secured to the housing body by means of a thumb screw 15.

The unitary housing body casting 5 is open at its bottom and has a top wall 4 over the portion thereof in which the lather generating mechanism is housed. The water reservoir 6 is formed integrally with the body as an upwardly opening well adapted to contain a substantial supply of water. At its bottom the reservoir has an outlet 16 which is communicated, as by means of a flexible tube 17, with the inlet of the pump 11.

The outlet of the pump is communicated by means of a flexible tube 18 with a socket-like well 19 formed in the top wall 4 of the housing body. A bored boss 20 on the underside of the cover is snugly received in this socket when the cover is in place to provide a connection by which water from the pump outlet may be transferred to the water inlet in the cover via another flexible tube 21, connected between the boss and the water inlet fitting 13. The underside of the boss 20 bears against a resilient O-ring 22 in the socket to provide a good seal at this connection, downward sealing pressure upon the cover being applied by securement of the thumb screw 15. It will be observed that because of the arrangement just described the cover may be removed from the housing body merely by removing the thumb screw and without the necessity for disconnecting any tubing, while installation of the cover and securement of the thumb

screw automatically completes a leak-proof connection between the pump outlet and the water inlet.

The water inlet fitting 13 also provides an air inlet, through which air may be introduced into the vessel 7 along with the water, as more fully described in the copending application of Howard E. Barrows, Serial No. 663,973, filed June 6, 1957.

It is undesirable to provide an excessive supply of water at times when lather generation is being initiated, but nevertheless it is at such times that the motor will turn at its highest speed because of the absence of load provided by lather generation. To insure that only a limited flow of water will at all times enter the restricted water inlet, the pump 11 is preferably of the well known impeller type which tends to maintain a substantially constant output at all speeds above a certain r.p.m. (determined by the pump characteristics), which r.p.m. is lower than that attained by the motor before lather generation begins.

The electric motor 8 has lugs 23 on its frame, and screws 25 extending upwardly through resilient bushings 26 in the lugs engage in downwardly opening threaded wells in bosses 24 in the housing body to mount the motor in the housing. The water pump 11 is mounted on the motor frame, and it will be observed that the resilient bushings 26 absorb any vibration of the motor as well as of the water pump and the soap holder drivingly connected with the motor. The screws 25 are accessible through the open bottom of the housing body to permit the motor and pump to be easily removed as a unitary subassembly.

The cylindrical vessel 7 is substantially cup-shaped. It has a circumferential flange 29 near its top that underlies an annular shoulder 30 on the underside of the top wall 4 of the housing body and a resilient gasket 31 is interposed between the flange and said shoulder to provide a seal. Circumferentially spaced portions of the flange 29 are widened to provide mounting lugs 27 by which the vessel is secured to the top wall of the housing body with screws 28. The top wall 4 of the body has a circular opening 32 above the lathering vessel, closed by a portion of the cover, and the cover has an annular interlocking seal 33 that engages the edges of said opening and the rim of the vessel 7.

A concentric downwardly projecting bored boss 34 on the bottom wall of the vessel 7 accommodates a portion of the upper end bell of the motor, so that the motor shaft can project up into the vessel to carry the soap holder 10. A resilient gasket 35 is interposed between an upwardly facing shoulder on said end bell and the bottom of the boss 34 to prevent leakage of water downwardly out of the vessel.

The soap holder 10 is preferably formed as a unitary casting of aluminum or other light material, having a harder bushing 37 in the center of its bottom wall by which it may be secured to the threaded upper end portion of the motor shaft to be rotatably carried by the latter with the side wall of the holder concentric with and spaced from the cylindrical side wall of the vessel 7. The inner surface of the side wall of the soap holder has a plurality of grooves 38 extending downwardly from its top edge and in which are engaged radially projecting lug or ridges 39 on a soap cake 40 adapted to be received in the holder, to thus assure that the soap will rotate with the holder, which might not otherwise be the case because of the characteristic slipperiness of the soap when wetted. Such rotation of the soap is of course necessary in order to obtain the centrifuging action by which water fed onto the top surface of the soap is converted into soap solution.

The side wall of the soap holder is provided with a plurality of circumferentially extending slots 42 through which soap solution may pass out of the cup-shaped holder into the annular space 44 between it and the cylindrical side wall of the vessel. These slots are spaced

a substantial distance below the upper edge of the soap holder, about on a level with the upper surface of a new cake of soap seated in the holder.

The annular space 44 constitutes the lathering chamber of the machine, i.e. the place where the soap solution is agitated and converted into the lather; and for this purpose the outer surface of the cylindrical side wall of the soap holder is provided with a plurality of circumferentially spaced lands or ridges 43 extending along its entire height. These lands coact with similar circumferentially spaced lands 46 on the inner surface of the cylindrical side wall of the vessel 7 to whip the soap solution into a lather.

The outlet for the generated lather leads from the top of the annular lathering chamber and comprises the spout 14 which may be formed integrally with the removable cover 12 for the housing body, and which projects forwardly beyond the front wall of the body. The outlet of the spout is closed by a substantially L-shaped gate 50, having a stem portion 51 which overlies the spout and a closure portion 52 which normally blocks the mouth of the spout. At its rear the gate is hinged to the top closure, and it is biased downwardly to a closed position by means of a spring 53. An outwardly projecting ledge 54 on the front of the gate facilitates raising it.

An upwardly extending passage 55 in the cover 12 communicates the spout with the lathering chamber 44, and it will be observed that the outlet from the lathering chamber is thus spaced a substantial distance above the level of the slots 42 through which the fresh soap solution enters the lathering chamber. Because of this positional relationship between the outlet, the slots 42 and the agitating lands on the soap holder, unfrothed soap solution cannot be expelled through the lather outlet, as has heretofore been the case where the outlet was disposed substantially in radial alignment with the soap holder.

It has been found that latter generation alone does not create sufficient pressure upon the formed lather to propel it upwardly and out of the outlet at a satisfactory rate, and to effect this result the lands or ridges 43 on the rotatable soap holder are steeply helical with the direction of the helix so related to the direction of rotation that their lower ends lead their upper ends and thereby enable the lands to exert a pumping action upon the generated lather to elevate it upwardly to and through the outlet.

In further explanation of why the invention assures against the possibility of unfrothed soap solution being expelled through the lather outlet, it will be seen that soap solution centrifuged out of the soap holder through said slots 42 impinges the cylindrical wall of the vessel 7 substantially below the upper edge of the soap holder. Hence only lather will appear in that portion of the lathering chamber which is located above the slots, where the upper portions of the lands will finally whip and condition such lather and propel it upwardly through the passage 55 to the spout.

To insure that soap solution will not flow over the top edge of the soap holder wall, but will enter the annular lathering chamber only through the slots 42, the cover 12 is provided at its underside with a downwardly projecting annular flange 57 which extends into the soap holder substantially to the upper edges of the slots and is closely adjacent to the side wall of the soap holder. The lather outlet passage 55 is of course located radially outwardly of this flange.

In order to insure that the lather issuing from the spout will be comfortably warm, an electric heating element 59 may be installed on the outer surface of the cylindrical wall of the vessel 7. This may comprise a wire-wound resistance element 60 sandwiched between two bands 61 of insulative material, the annular "sandwich" being secured around the vessel by means of a

clamping band 62 having its ends connected under tension by means of a spring clip 63. Heat from the resistance element will be transmitted through the wall of the vessel to the soap solution and the lather therein, so that lather will be heated as it is generated, even though the water in the reservoir 6 is relatively cool. It will be obvious to those skilled in the art that a thermostatic switch 64 may be connected in series circuit with the heating element to control the energization of the latter and thus maintain within desired limits the temperature of the lather generated by the machine.

To enhance its appearance, the top of the machine may be closed by a readily removable cap 66 which conceals the upper portion of the water inlet and other structure mounted on the cover 12. This cap may simply remain in place by its own weight, being properly located on the machine by means of studs 67 projecting upwardly from the top closure and engaging in downwardly opening wells in bosses 68 on the underside of the cap.

Operation of the machine is controlled by means of a switch 69 mounted inside the housing body between the water reservoir and the lather generating mechanism. At the front of the housing is an actuator 70 for the switch comprising a lever projecting laterally beneath the lather outlet spout, so that an operator may place his cupped hand beneath the spout to receive lather issuing therefrom and simultaneously, with the same hand, depress the switch to start the machine and, using his thumb, raise the gate away from its normal position blocking the mouth of the spout. When sufficient lather has been developed, he need only lift his hand off of the switch actuator and, continuing the upward motion, wipe the mouth of the spout before releasing the gate.

From the foregoing description taken together with the accompanying drawings it will be readily apparent that the lather making machine of this invention generates lather in an efficient manner, without reliance upon brushes or other frictional soap engaging means, and expels such lather at a uniform rate, the lather produced by the machine being of good quality and consistency and not mixed with unfrothed soap solution. It will also be apparent that the machine of this invention is very convenient to use, especially because it may be operated with one hand and because it incorporates means for very quickly and efficiently heating lather so that comfortably warm lather can be produced almost as soon as the machine is put into operation, without any necessity for waiting for water in the reservoir to be warmed.

What is claimed as my invention is:

1. A lather making machine comprising: a vessel having a round side wall and a movable cover; an open topped cup-shaped soap holder rotatably mounted in said vessel with its side wall concentric with and spaced from the side wall of the vessel, the annular space between said side walls providing a lathering chamber in which soap solution is converted into lather; means defining a lather outlet having a bottom wall over which the lather flows as it leaves the machine, said outlet leading upwardly away from the top of said lathering chamber and having its bottom wall spaced above the top of the lathering chamber and the top of the soap holder; means in said lathering chamber for converting soap solution into lather, said means including circumferentially spaced helical lands projecting from the side wall of the soap holder, which lands propel the lather upward towards the lather outlet when the soap holder rotates in the direc-

tion causing the lower ends of the lands to lead the upper ends thereof; drive means connected with the soap holder to drive the same in said direction; means carried by the cover for the vessel providing a restricted water inlet opening to the interior of the soap holder through which water may be caused to impinge the top of a cake of soap in the holder whereby rotation of the holder and the cake of soap therein produces a soap solution in the soap holder; and means defining a flow passage leading from the interior to the exterior of the side wall of the soap holder through which such soap solution is expelled from the soap holder, said passage opening to the lathering chamber below the upper edge of the soap holder so that soap solution enters the lathering chamber at a level well below the lather outlet.

2. The lather making machine of claim 1, wherein said flow passage is in the form of openings in the side wall of the soap holder.

3. The lather making machine of claim 1, wherein said flow passage is in the form of circumferential slots through the side wall of the soap holder below and parallel with the upper edge thereof.

4. A lather making machine comprising: a cup-shaped soap holder mounted for rotation on an upright axis and having circumferential slots in its side wall, spaced below the upper edge thereof; a vessel in which the soap holder is located, said vessel having a cover and a substantially cylindrical side wall concentric with and spaced from the side wall of the soap holder, the annular space between said side walls providing a lathering chamber in which soap solution is converted into lather; means defining a lather outlet having a bottom wall over which the lather flows as it leaves the machine, said outlet leading from the lathering chamber and having its bottom wall at an elevation spaced above said circumferential slots in the side wall of the soap holder; means carried by the cover of the vessel defining a restricted water inlet opening into the soap holder and through which water may be directed downwardly onto the face of a cake of soap in the soap holder and thence expelled, as soap solution, through said circumferential slots into the lathering chamber; drive means connected with the soap holder to rotate the same; a plurality of circumferentially spaced lands projecting from the outer surface of the side wall of the soap holder for agitating soap solution in the lathering chamber; and an annular flange on the underside of the cover of the vessel concentric with the soap holder and projecting downwardly therefrom, said flange having a close though free running fit with the upper edge portion of the side wall of the soap holder so as to constrain unfrothed soap solution from passing into said lathering chamber except through said slots to thus insure that only lather will issue from the lather outlet.

5. The lather making machine of claim 4, wherein the cover of said vessel is separate and movable from the rest of the vessel; and wherein the lather outlet comprises a spout formed integrally with said movable cover with the inlet to the spout opening to the underside of the cover radially outwardly of said annular flange.

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