

June 12, 1928.

1,673,228

F. J. CANTRELL

SOAP DISPENSING DEVICE

Filed Jan. 5, 1927

2 Sheets-Sheet 1

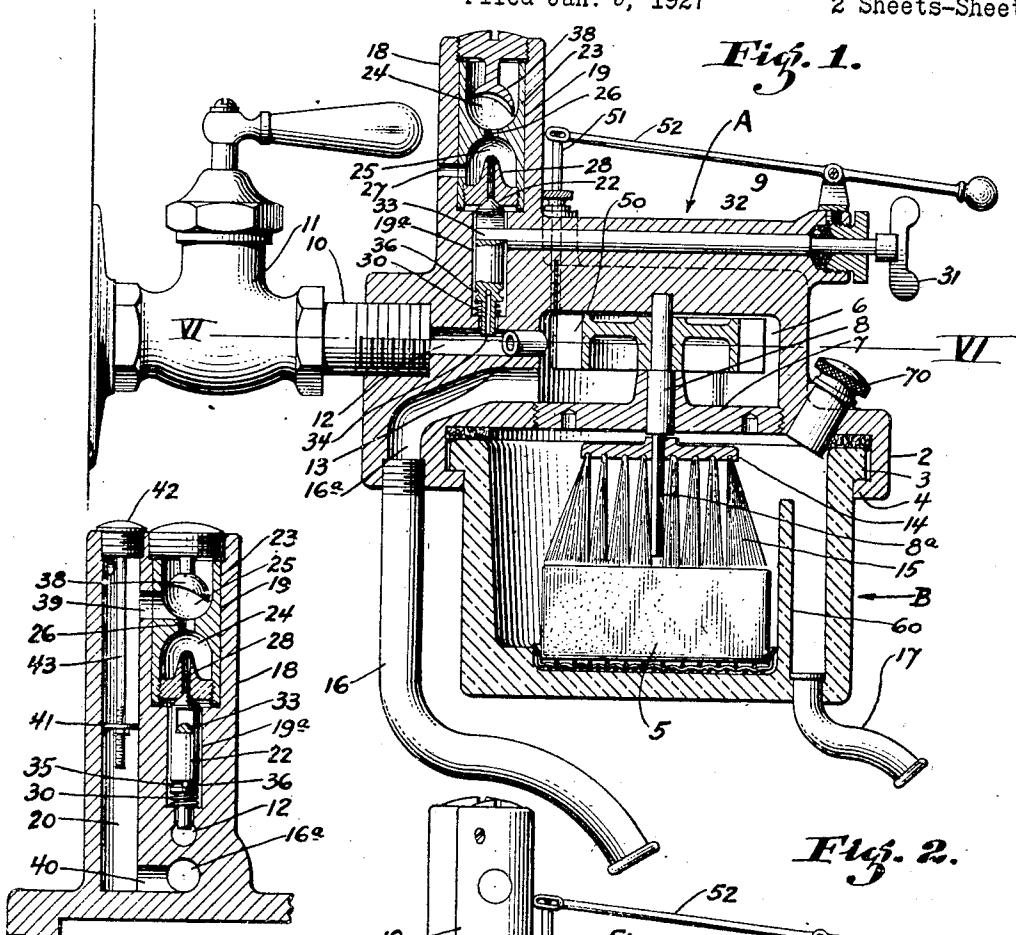
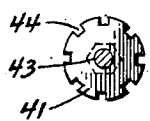
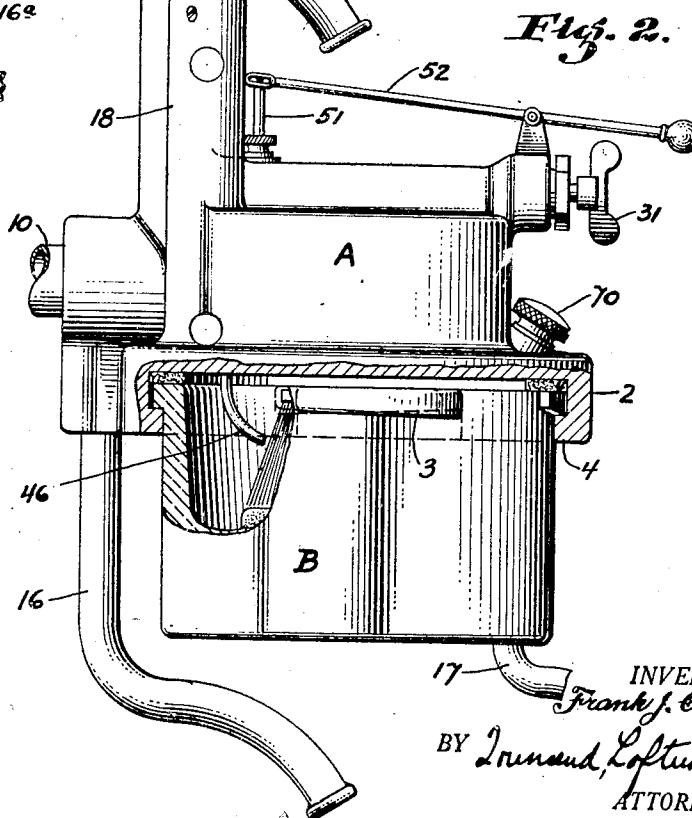


Fig. 3.

Fig. 4.



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2 Sheets-Sheet 2

Fig. 5.

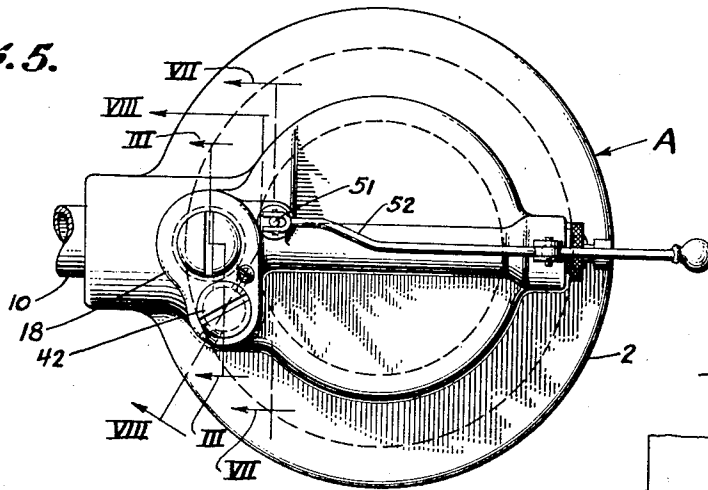


Fig. 7.

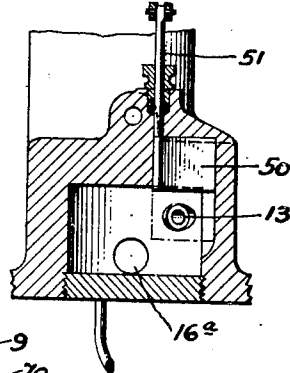


Fig. 6.

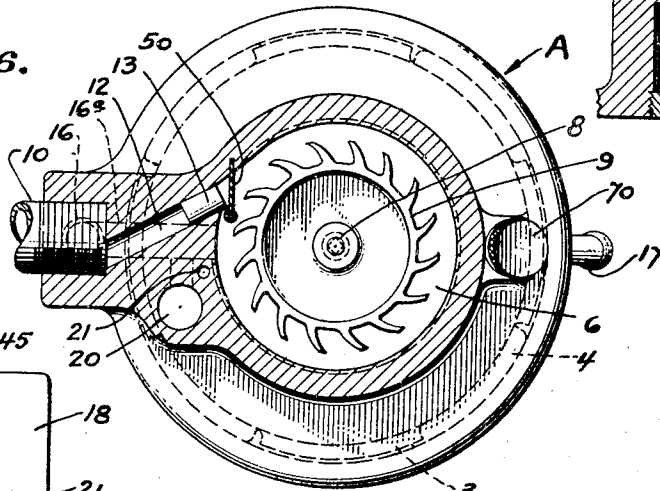


Fig. 8.

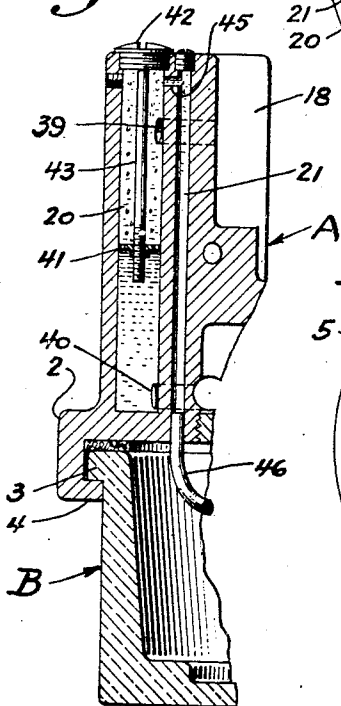
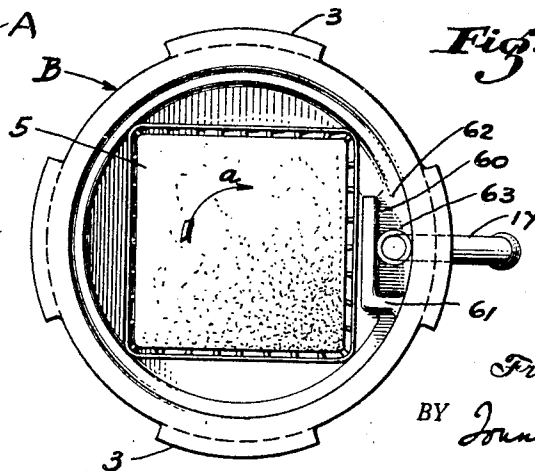


Fig. 9.



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SOAP-DISPENSING DEVICE.

Application filed January 5, 1927. Serial No. 159,040.

This invention relates to a soap dispensing device.

A considerable number of soap dispensing devices are more or less in common use at this time, but practically all require the use of a liquid soap. The present invention embodies a soap dispensing device wherein any ordinary hard or cake soap may be employed and it consists in providing means whereby the cake soap may be dissolved and discharged in the form of a rich creamy soap foam or suds in quantities as required and further to provide means whereby an antiseptic or the-like may be introduced when required. The invention is shown by way of illustration in the accompanying drawings, in which:

Figure 1 is a central vertical section of the soap dispensing device,

Figure 2 is a side elevation of the soap dispensing device, said view being partly broken away and being shown partly in section,

Figure 3 is an enlarged section taken on the line III—III of Figure 5, showing the injector nozzle whereby air is introduced,

Figure 4 is an enlarged plan view of the air and water separating valve,

Figure 5 is a plan view of the soap dispensing device,

Figure 6 is a plan view partially in section taken on the line VI—VI of Figure 1,

Figure 7 is an enlarged detail sectional view taken on the line VII—VII of Figure 5, showing the deflector plate whereby the jet for the water-wheel is deflected, when not required,

Figure 8 is an enlarged detail section taken on the line VIII—VIII of Figure 5, said view showing the water and air separating valve and the duct whereby air and a small quantity of water is delivered to the soap container,

Figure 9 is a plan view of the soap container showing it removed with relation to the head member of the soap dispensing device.

Referring to the drawings, in detail, and particularly to Figures 1 and 2, it might be stated that the soap dispensing device consists of two main members, to-wit: a head member generally indicated at A and a soap container or receptacle B. The lower part of the head member is provided with an annular downwardly projecting flange 2 which

is provided for the purpose of supporting and securing the soap receptacle B. This receptacle is preferably made of glass or a like material. The upper end thereof is provided with a plurality of lugs 3 and these are engaged by cooperating lugs 4 formed on the annular flange 2. An ordinary cam interlock is thus formed between the head member and the soap receptacle and the receptacle may, accordingly, be removed from time to time to permit insertion of a soap cake or the like such as indicated at 5.

The head member is provided with a central chamber 6 which is closed by means of a bottom bearing plate 7. Vertically disposed in the head member and journalled in the bottom plate is a shaft 8 and secured thereon is a water-wheel 9. Formed on one side of the head member is a water inlet connection whereby the head may be connected with a suitable source of water supply, under pressure, as by a pipe 10 and a controlling valve 11. Formed intermediate the inlet pipe 10 and the chamber 6 containing the water-wheel is a passage 12 and mounted at the inner end of the passage is a nozzle 13. This nozzle projects a jet of water against the edge of the water-wheel 9 and thereby causes the same to rotate at a fairly high speed. The water-wheel is secured to the shaft 8 and causes this to rotate in unison therewith. The shaft 8 is provided with an extension 8^a which projects downwardly into the soap receptacle B. This projection of the shaft is square in cross section and it carries a brush head 14 having bristles 15. The brush head is freely slidable on the squared extension of the shaft 8, but is, nevertheless, rotated by the shaft. This vertical movement of the brush with relation to the shaft is employed as it permits the brush to remain in contact with the upper surface of the soap and to settle downwardly as the soap is dissolved or worn away.

Connected with the head member A, at a point below the inlet pipe 10 is a discharge pipe 16 and formed within the head between the discharge pipe and the water-wheel chamber 6 is a discharge passage 16^a. The water impinges against the water-wheel and rotating the same drops downwardly from the wheel and collects in the lower portion of the chamber 6, then passes out through passage 16^a and finally discharges

through the discharge pipe 16 and as such may be employed for washwater or the like, as will later be described.

In actual practice, it is obvious that it will be necessary to supply a certain amount of water to the soap receptacle to permit the soap to be dissolved to a sufficient extent to form a soap foam or suds which may be discharged through the pipe indicated at 17. It has also been found that the soap suds are more readily formed if a certain amount of air is simultaneously introduced. Means have, accordingly, been provided for introducing air and a proportionate amount of water and this means is, perhaps, best illustrated in Figures 1, 3 and 8. By referring to these figures, it will be noted that the head member is provided with a vertical tubular-like extension generally indicated at 18. Formed in this extension are three passages such as indicated at 19, 20 and 21. The passage 19 is disposed directly above the water inlet duct or passage 12 and water may be admitted to the passage 19 through means of a valve generally indicated at 22. The passage 19 is enlarged in its upper end and reduced in diameter in its lower end, as indicated at 19^a and the valve 22 is mounted in the reduced lower end of the passage. A loose fit is, however, obtained between the valve and the passage and water is, accordingly, free to circulate upwardly around the valve. The upper enlarged portion of the chamber 19 contains a cage 23. Two chambers are formed in the cage, as indicated at 24 and 25. These chambers communicate with each other through a passage 26 and the lower chamber communicates with the atmosphere through a side duct 27. The lower end of the chamber 25 is closed by means of an injector nozzle 28 and a flow of water through this nozzle is obtained by means of the valve 22, as the valve seats against the lower end of the nozzle. The valve is normally maintained in engagement with the seat by means of a spring 30 and it can only be opened when the handle indicated at 31 is rotated. This handle is secured on a rod 32 extending through the head member. The inner end of the rod is offset to form a cam member 33 and this cam member projects through a slot formed in the valve. By rotating the rod in the cam member by means of the handle 31 in one direction, the valve 22 is depressed and water will then flow upwardly through the passage 12 and will discharge through the injector nozzle 28, the flow of water being permitted, due to the loose fit of the valve and due to the central passage formed in the lower end of the valve and indicated at 34. The upper end of this central passage terminates in radial passages 35 which communicates with an annular groove 36 and the flow of water is thus materially increased. If

the valve 22 is open and water under pressure and at a fairly high velocity is discharging through the injector nozzle 28, the jet produced will discharge through the passage 26 into the upper passage 24. A suction or a vacuum condition is thus produced in the lower chamber 35 and air will continuously enter through atmospheric passage 37. This air passes through the water jet nozzle up into the chamber 24. The air and the water jet here impinges against the deflector plate 38 (see Figures 1 and 3) and as such is deflected through a lateral passage 39 into the chamber 20 which serves the function of separating the air and the water, that is, the water tends to drop, by gravity, to the end of the chamber 20 while the air tends to rise. The water dropping to the bottom of the chamber discharges through the lateral passage 40 and as this passage communicates with the discharge passage 16^a it is finally permitted to discharge through the pipe 16. The air would also have a tendency, under normal conditions, to pass downwardly with the water and discharge through pipe 16 and means must, accordingly, be provided for preventing the escape of the air through the passages 40 and 16^a.

The means employed is a rotary valve or disc generally disclosed at 41 (see Figures 3 and 8). The upper end of the chamber 20 is closed by means of a plug 42. This plug carries a stem 43 which projects downwardly into the chamber 20 and the lower end of the stem is threaded to receive the disc 41. The peripheral edge of the disc is notched as indicated at 44 and the water is thus permitted to discharge through the notches and downwardly towards the passages 40 and 16^a and separation of the air and water is thus obtained. The upper end of the passage 20 connects through a lateral passage 45 with the passage 21 and air thus escapes through the lateral passage 45 into the passage 21. From here it passes downwardly and discharges through a feed tube 46 into the soap receptacle. This tube is bent or directed towards the brush 15 and water and air is discharged through this tube against the brush from where it drops downwardly onto the soap cake, thereby permitting a creamy soap foam to be formed when the brush is rotating. The restricting member 41 serves two functions: first, that of separating the air and water by restricting the escape of the water through the passages 40 and 16 and its second function is that of preventing the escape of all of the water discharging from the injector nozzle 28. In other words, a certain proportion of the water entering the chamber 20 is discharged with the air through the lateral passages 45 in the chamber 41 and from there it is passed downwardly through the feed tube 46 into

the soap receptacle. The amount of water thus supplied may be regulated by changing the position of the register or valve 41 and also by regulating the amount of water dis-

charging through the injector nozzle 28, this regulation being obtained by the handle 31 or, in other words, by positioning the valve 22 with relation to the seat at the lower end of the injector nozzle. The opposite end, as indicated at 62. The direction of rotation of the soap brush is indicated by the arrow A in Figure 9. This rotation causes the soap foam to swirl in the same direction and it thus collects in the pocket 63 formed between the plates 60 and 61. The pipe 17 is connected with the bottom of this pocket and the soap foam is thus collected and discharged as formed. The bottom of the pocket 63 is furthermore, positioned slightly below the level of the bottom of the soap cake and any excess water or collection of soap foam is thus prevented, as it will immediately drain out thus preventing the soap cake from being dissolved by standing in moist soap suds or water. The head member is also provided with a plug such as indicated at 70. This plug may be secured by a threaded connection or by a friction fit, as here indicated.

Antiseptics, perfumes or the like may be introduced by removing the plugs 70 and the utility of the device is thus increased, for instance, for hospital use and the like. The entire mechanism employed is at all times enclosed and protected from dust and dirt. The soap within the receptacle is similarly protected and is at no time handled. Ideal sanitary conditions are thus provided and contamination is entirely prevented.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly that the materials and finishes of the several parts employed may be such as the manufacturer may decide or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. A device of the character described, comprising a head member having a closed chamber formed therein, a soap receptacle attached to the head member and adapted to contain a cake of soap, a water-wheel in the chamber, a shaft supporting the water-wheel and extending into the soap receptacle, said shaft carrying a brush adapted to be maintained in contact with the soap, a nozzle in the head member and in communication with the chamber, means connecting the nozzle with a source of water supply under pressure, to direct a jet of water against the water-wheel to rotate the water-wheel, the shaft and the brush, means for discharging the water after it impinges on the water-wheel, and means actuated by the water, under pressure, by which air and water are directed to the soap receptacle, said soap receptacle having a discharge connection through which soap suds are discharged.

2. A device of the character described,

In actual practice, the soap dispensing device, here illustrated, may be connected with a plumbing fixture in the usual manner, for instance, directly above a washstand, or a bath-tub or the like or it may be placed at the height of a shower head if desired. The function of the soap dispensing device will, in any instance, be the same. If the device is positioned adjacent the wash-basin and it is desired to wash, the person using the same will merely open the valve 11. The water entering the passage 12 partially discharges through the nozzle 13 and thereby causes rotation of the water-wheel and the brush. A portion of the water also discharges upwardly by the valve 22, if this is opened, and air and water is thus discharged against the brush and the soap foam is obtained and discharged through the pipe 17. The waste water from the water-wheel and from the chamber 20 is, at the same time, discharging through the pipe 16. The wash-basin may be filled up with water, if desired, or the person may wash directly from the water discharging from the pipe. When a person is through using the soap and rinsing water, he merely closes the valve 22 by means of the handle 31 and stops the rotation of the brush 15 so as not to wear away the soap unnecessarily by depressing the deflector plate generally shown in Figures 1 and 7.

The deflector plate is indicated at 50 and is mounted directly above the discharge nozzle 13. The plate is secured to a rod 51 and this is, in turn, actuated by a pivotally mounted lever 52. By pulling upwardly on the outer end of the handle or lever 52, the deflector plate 50 is forced downwardly in front of the nozzle 13. The water is thus deflected downwardly into the chamber 6 and will continue to discharge through the pipe 16. Rotation of the wheel and brush 15 is, however, stopped, as the water is prevented from impinging against the wheel. Rinsing water is thus obtained without wasting any soap. For the purpose of further preventing waste of soap and for the purpose of immediately collecting the soap foam and discharging it as it is formed, a vertical deflector plate 60 is formed within the soap receptacle. This plate is spaced with relation to the side wall of the soap receptacle, as shown in Figure 9 and is provided with an end section such as indicated at 61.

A pocket is thus formed which is open at

comprising a head member having a closed chamber formed therein, a soap receptacle attached to the head member and adapted to contain a cake of soap, a water-wheel in the chamber, a shaft supporting the water-wheel and extending into the soap receptacle, said shaft carrying a brush adapted to be maintained in contact with the soap, a nozzle in the head member and in communication with the chamber, means connecting the nozzle with a source of water supply under pressure, to direct a jet of water against the water-wheel to rotate the water-wheel, the shaft and the brush, means for discharging the water after it impinges on the water-wheel, an air injector nozzle mounted in the head member, means for delivering water, under pressure, to operate the injector, means for separating the major portion of the water and the air drawn in by the injector, means for discharging the water, and means for discharging the air and a portion of the water into the soap receptacle, said soap receptacle having a discharge connection whereby soap suds are discharged.

3. A device of the character described, comprising a head member having a closed chamber formed therein, a soap receptacle attached to the head member and adapted to contain a cake of soap, a water-wheel in the chamber, a shaft supporting the water-wheel and extending into the soap receptacle, said shaft carrying a brush adapted to be maintained in contact with the soap, a nozzle in the head member and in communication with the chamber, means connecting the nozzle with a source of water supply under pressure, to direct a jet of water against the water-wheel to rotate the water-wheel, the shaft and the brush, means for discharging the water after it impinges on the water-wheel, an air injector nozzle mounted in the head member, means for delivering water, under pressure, to operate the injector, means for separating the major portion of the water and the air drawn in by the injector, means for discharging the water, means for discharging the air and a portion of the water into the soap receptacle, said soap receptacle having a discharge connection whereby soap suds are discharged, and a manually actuated valve controlling the flow of water to the injector.

4. A device of the character described, comprising a head member having a closed chamber formed therein, a soap receptacle attached to the head member and adapted to contain a cake of soap, a water-wheel in the chamber, a shaft supporting the water-wheel and extending into the soap receptacle, said shaft carrying a brush adapted to be maintained in contact with the soap, a nozzle in the head member and in communication with the chamber, means connecting the nozzle with a source of water supply under pres-

sure, to direct a jet of water against the water-wheel to rotate the water-wheel, the shaft and the brush, means for discharging the water after it impinges on the water-wheel, an air injector nozzle mounted in the head member, means for delivering water, under pressure, to operate the injector, means for separating the major portion of the water and the air drawn in by the injector, means for discharging the water, means for discharging the air and a portion of the water into the soap receptacle, said soap receptacle having a discharge connection whereby soap suds are discharged, and a manually controlled deflector member adapted to be raised and lowered with relation to the nozzle to deflect the water directly from the nozzle to the discharge when rotation of the water-wheel is not required.

5. A device of the character described, comprising a head member having a closed chamber formed therein, a soap receptacle attached to the head member and adapted to contain a cake of soap, a water-wheel in the chamber, a shaft supporting the water-wheel and extending into the soap receptacle, said shaft carrying a brush adapted to be maintained in contact with the soap, a nozzle in the head member and in communication with the chamber, means connecting the nozzle with a source of water supply under pressure, to direct a jet of water against the water-wheel to rotate the water-wheel, the shaft and the brush, means for discharging the water after it impinges on the water-wheel, an air injector nozzle mounted in the head member, means for delivering water, under pressure, to operate the injector, means for separating the major portion of the water and the air drawn in by the injector, means for discharging the water, means for discharging the air and a portion of the water into the soap receptacle, said soap receptacle having a discharge connection whereby soap suds are discharged, a manually controlled deflector member adapted to be raised and lowered with relation to the nozzle to deflect the water directly from the nozzle to the discharge when rotation of the water-wheel is not required, and a manually controlled valve to regulate the flow of water to the injector.

6. A device of the character described, comprising a head member, a soap receptacle attached thereto and adapted to contain a cake of soap, a brush carried by the head member and adapted to engage with the soap, means in the head member for rotating the brush, and an injector in the head member for delivering air and water to the brush.

7. A device of the character described, comprising a head member, a soap receptacle attached thereto and adapted to contain a

cake of soap, a brush carried by the head member and adapted to engage with the soap, means in the head member for rotating the brush, means in the head member for delivering air and water to the brush, a deflector member within the soap receptacle forming with the wall of the soap receptacle a collecting chamber, and a discharge chamber in communication with said collecting chamber.

8. A device of the character described, comprising a head member, a soap receptacle attached thereto and adapted to contain a cake of soap, a brush carried by the head member and adapted to engage with the soap, means in the head member for rotating the brush, an injector in the head member for delivering air and water to the brush, said air and water forming a soap suds when the brush is rotated, and means for collecting the soap suds and discharging the same from the soap receptacle.

9. A device of the character described, comprising a head member, a soap receptacle

attached thereto, a brush carried by the head member and extending into the soap receptacle and adapted to engage a cake of soap mounted therein, means in the head member for rotating the brush, a source of water supply, under pressure, connected with the head member, an injector mounted in the head member, said injector being in communication with a separating chamber formed in the head member and also being in communication with the atmosphere to cause an inflow of air when water is discharged through the injector, a manually controlled valve regulating the flow of water, under pressure, through the injector, means for discharging a portion of the water, delivered by the injector into the separating chamber, and means for directing the air and a portion of the water into the soap receptacle to form soap suds when rotation is transmitted to the brush, and means for discharging the soap suds.

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