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E. M. LEWIECKI ET AL

3,095,122

AEROSOL DISPENSERS

Filed Dec. 9, 1959

FIG. 1

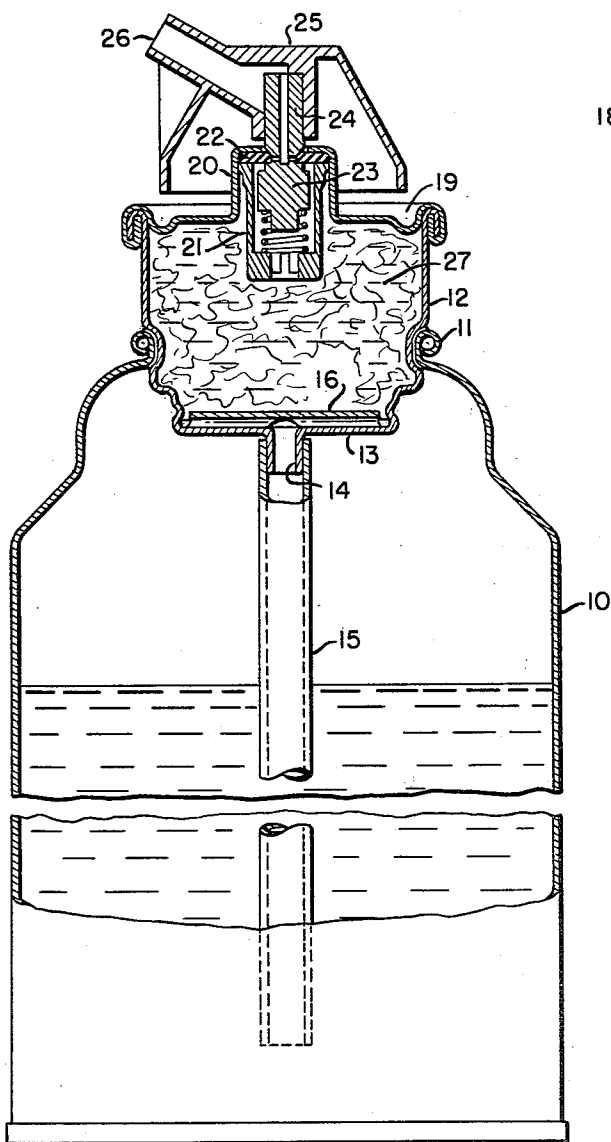
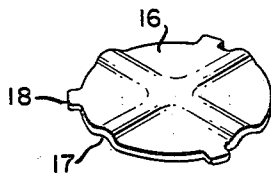


FIG. 2

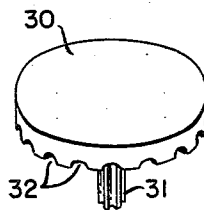


FIG. 3

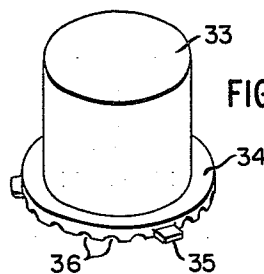


FIG. 4

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AEROSOL DISPENSERS

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The present invention relates generally to pressurized dispensing devices and more particularly to means for and process of dispensing the contents of such devices in warmed condition.

Among the objects of the present invention is the provision of an improved pressurized container that permits the heating of a portion of the contents prior to the discharge thereof and of a new and improved process of preparing and dispensing the contents of a pressurized container as a warmed fluid, foam, aerosol spray or the like.

The invention will be described herein with particular reference to pressurized containers for dispensing foam type shaving cream for which the invention is particularly advantageous, but it will be appreciated from the following description of an illustrative embodiment of the invention that it is equally applicable to other types of pressurized containers for dispensing the contents thereof in a warmed condition.

Foam type shaving cream is produced from an aqueous colloidal dispersion of soap with a volatile propellant contained in a valve-controlled pressure-type container. From such a container the foam is dispensed as a lather applicable to the facial skin without using a brush. The propellants usually employed are gaseous at room temperature and pressure but may be contained in liquid condition under pressure. Upon releasing the valve of the container, the colloidal dispersion emerges in the form of a fine stable lather that may be applied directly by the user preparatory to shaving. The lather as heretofore dispensed has been cool and is usually cooled below body temperature by the expansion of the gaseous propellant. Particularly on a cold morning, the application of cool lather is not entirely pleasant in chilling the skin of the user. The object of the present invention is to produce and dispense shaving lather in heated or pleasantly warmed condition, thus improving the comfort of the user and rendering the action of the lather more effective in softening the beard to be removed. In one aspect therefore the invention is characterized by the steps of confining a liquid charge of a colloidal dispersion of a volatile propellant in soap solution in a segregated or partially isolated chamber, heating the confined liquid charge to substantially above room temperature and then discharging from the chamber the heated liquid in condition to expand immediately into a lather at above body temperature.

The process of our invention has the advantage that it requires only the heating of a relatively small volume of liquid rather than the much larger volume of resulting lather. The charge of liquid may be just sufficient to furnish lather for a single shave and the heat supplied sufficient to raise the temperature of the liquid so that the lather is discharged comfortably above the body temperature of the user.

The novel process of our invention may be carried out by providing any of the commercially available containers with an external chamber so arranged as to contain the desired charge of the liquid colloidal dispersion and so disposed that the liquid charge may be readily heated by hot water or otherwise so that the heat supplied to the liquid may be carried over into the resulting lather.

A feature of the apparatus consists in means for at least partially segregating from the cool colloidal dis-

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persion within the container the liquid charge which is to be heated. As herein shown, this result is effected by placing a baffle or disc over the inlet port of the charge-containing chamber. The disc thus serves the double function of partially segregating the charge and of causing the colloidal dispersion, when admitted, to flow toward the heated walls of the chamber.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment of apparatus which is particularly well adapted for carrying out the process, selected for purposes of illustration and shown in the accompanying drawings, in which—

FIG. 1 is a view in elevation partly in longitudinal section;

FIG. 2 is a view in perspective of the baffle shown in FIG. 1, and

FIGS. 3 and 4 are views in perspective of baffles of modified form.

The apparatus shown in FIG. 1 comprises a metallic pressure-proof container or can 10 of which the upper portion is rounded and tapered to form a circular opening surrounded by a rolled bead 11 spun from the metal of the can. The bead 11 is formed to make an interlocking pressure-proof connection and seal with a cylindrical heat-conductive chamber 12 which is permanently attached to the can 10 with its bottom 13 offset inwardly within the mouth of the can. The chamber may be formed of thin sheet metal and has an inwardly extending circumferential groove in its wall to receive the bead 11. Its lower portion within the can is tapered downwardly to a flat bottom 13 of substantially less diameter than the body of the chamber.

The bottom 13 is centrally perforated and provided with a short downwardly extending hollow inlet stem 14. This is telescopically received within the upper end of a tube 15 extending toward the bottom of the can and open at its lower end so that the liquid colloidal dispersion contained within the can may be admitted to the chamber 12. Flow of the liquid through the inlet stem 14 is deflected by a disc 16 which rests concentrically upon the bottom 13 of the chamber 12 and is provided with intersecting diagonal grooves 17. The disc is also provided with projecting ears 18 which are engaged beneath the annular rib formed in the lower part of the chamber 12. The purpose of the disc 16 is to segregate the charge being warmed in the chamber 12 from the cooler liquid entering the chamber through the inlet stem 14, and to direct such entering liquid outwardly toward the heated cylindrical wall of the chamber.

The chamber 12 is closed by a circular cover 19 having a circular flange interlocking with a corresponding flange of the chamber 12. The cover is formed with a central cylindrical dome 20 in which is telescopically received a cylindrical valve casing 21. This is sealed to the top of the dome 20 through the medium of a perforated gasket 22. Within the casing 21 is a cylindrical valve body 23 having an upwardly extending hollow stem 24 projecting upwardly through the dome 20 and held in closed condition by a compression spring within the valve cylinder. The stem 24 extends into a socket formed in a dispersion cap 25 having an outlet duct 26. It will be seen that when the cap 25 is depressed or tilted, the upper end of the valve 23 is temporarily separated from the surface of the gasket 22 and the liquid charge which has been heated in the chamber 12 is allowed to escape through the duct 26. As herein shown the conductive chamber 12 is partially filled with a metallic wool 27 or other heat-conductive and distributing material. The heat transfer characteristics of the chamber 12 may be improved, if desired, by increasing the effective surface

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area thereof such as by providing it with external or internal fins.

In FIGS. 3 and 4 are shown alternative forms of the inlet controlling element shown in FIG. 2. That of FIG. 3 comprises a disc 30 having a fluted downwardly extending stem 31 arranged to fit with clearance in the hollow inlet stem 14. The lower face of the disc 30 is provided with radial grooves, and when this device is employed, the cool colloidal dispersion will pass upwardly through the passage provided by the flutes of the stem 31 and then flow outwardly through radial grooves 32 toward the walls of the chamber 12 where heat is being applied.

The device shown in FIG. 4 comprises a circular disc 34 having radially extending holding ears 35 and radial slots 36 in its bottom face. From the disc extends a plug 33 which may be solid or tubular. When this device is employed, cool colloidal dispersion entering from the inlet stem 14 will be directed outwardly through the grooves 36 toward the cylindrical walls of the chamber 12 and will be confined to an annular space within them by the plug 33.

The can 10 is herein shown as partially filled with a liquid colloidal dispersion of soap solution and a volatile organic liquid serving as a propellant and having suitable vapor pressure for that purpose. The colloidal dispersion of the propellant in soap solution may take the form of a colloidal solution, colloidal suspension, or emulsion, depending primarily upon the propellant employed and the composition of the soap solution. The action is such that, when the heated charge in the chamber 12 is vented and allowed to escape through the duct, the propellant vaporizes or expands, forming fine gas cells throughout the heated charge and converting the liquid phase soap solution into a warm lather.

The nature of the soap is of secondary importance. Suitable soaps include the soluble stearate soaps, such as potassium, ammonium and soluble amine soaps of commercial stearic acid.

In general it is advantageous to employ water-insoluble propellants, such as straight chain saturated aliphatic hydrocarbons of suitable vapor pressure. These comprise propane, butane, isobutane and cyclobutane. Water insoluble chlorine and fluorine substituted hydrocarbons may also be employed with satisfactory results. A practical range of propellant vapor pressure lies between 15 and 65 pounds per square inch gauge at 70° F.

As shown in FIG. 1 the container is partially filled with propellant-containing colloidal dispersion of the type above described. The upper portion of the can is filled with the propellant vapor under pressure sufficient to force the colloidal dispersion upwardly through the tube 15 and fill the chamber 12 with a measured charge. In use the chamber 12 may be heated, as by holding it under a hot water faucet or in a hot air blast, and the liquid charge thereby heated sufficiently to maintain the discharged lather at the desired elevated temperature for immediate application to the face of the user when the liquid is permitted to escape by depressing or tilting the cap 25.

Hot water is usually available in the household at 120 to 150° F. and by merely holding the chamber 12 in such a stream, the liquid charge contained therein is quick-

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ly raised to such a temperature that the resulting lather will emerge at the desired temperature.

Having thus disclosed our invention and described an illustrative embodiment of a device for carrying out the process, we claim as new and desire to secure by Letters Patent:

1. A device for preparing and dispensing heated foam, comprising a container for a supply of a liquid colloidal dispersion of a volatile propellant in a soap solution, a cylindrical heat-conductive chamber of sheet metal projecting in exposed position from said container and having an inlet connection within the container and an outlet in its outer portion, heat-conductive means in and in contact with the walls of said chamber, and a circular baffle in said chamber above the inlet connection shaped to direct liquid from said inlet connection into heat exchange relation with the outer walls of said chamber and said heat-conductive means.

2. A device for preparing and dispensing heated foam as described in claim 1, further characterized in that the baffle has a circular corrugated base from which rises a cylindrical plug for directing the liquid into annular formation.

3. A device for dispensing a heated propellant-containing material, comprising a container for a supply of propellant-containing material, a heat-conductive chamber secured to said container in an exposed position having an inlet connection therewith and a valved outlet, heat-conductive means in and in contact with the walls of said chamber, and a baffle adjacent to said connection for directing the flow of material outwardly into heat exchange relation with the walls of said chamber and said heat-conductive means.

4. A device for dispensing a heated pressurized material, comprising a container for a supply of pressurized material, a heat-conductive chamber secured to said container in an exposed position and having an inlet connection therewith and a self-closing outlet valve, heat-conductive means in and in contact with the walls of said chamber, and a baffle adjacent to said inlet connection for directing the flow of material outwardly into heat exchange relation with the walls of said chamber and said heat-conductive means.

5. A device for dispensing a heated propellant containing material described in claim 3, further characterized in that said heat-conductive means is metal wool.

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