Feb. 24, 1970 T. F. BOMBERO ET AL 3,497,110

AEROSOL DISPENSER

Filed April 12, 1968

FIG. 1

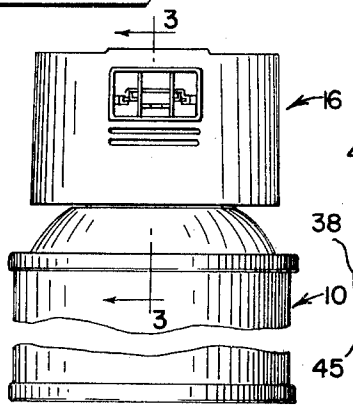


FIG. 4

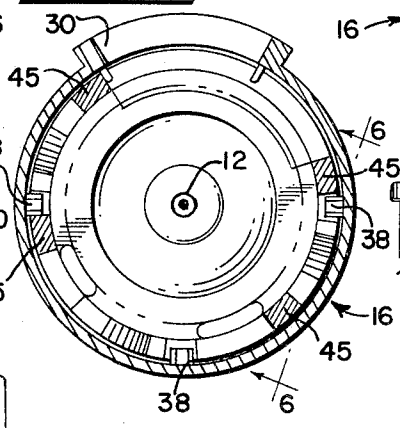
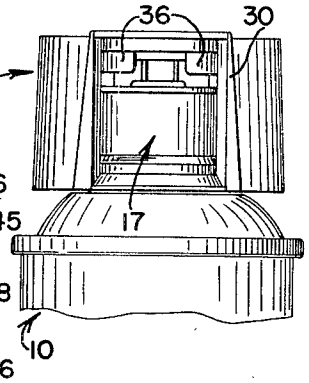


FIG. 2



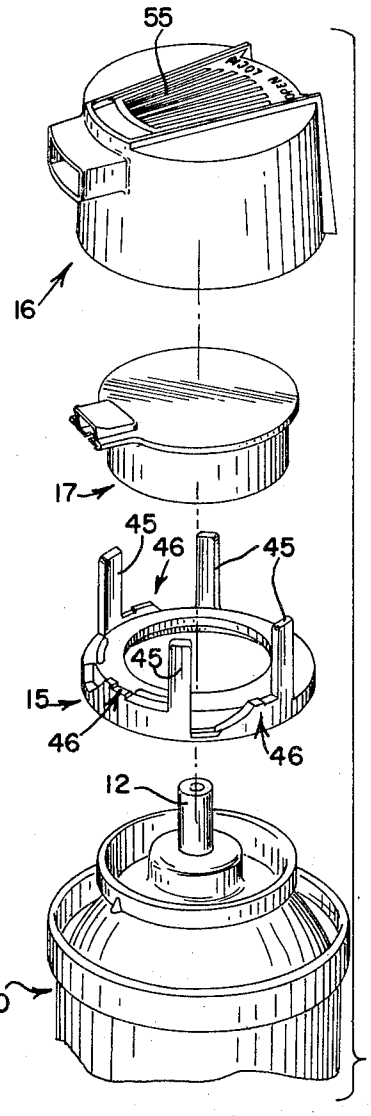


FIG. 3

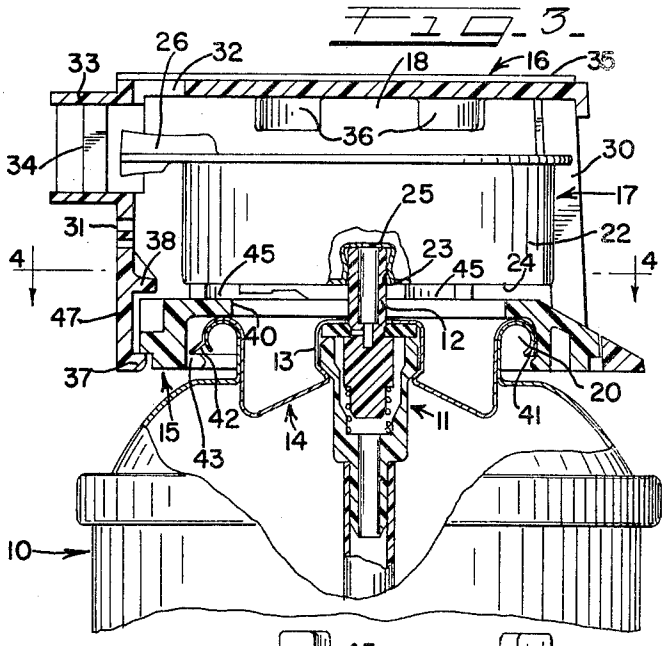


FIG. 6

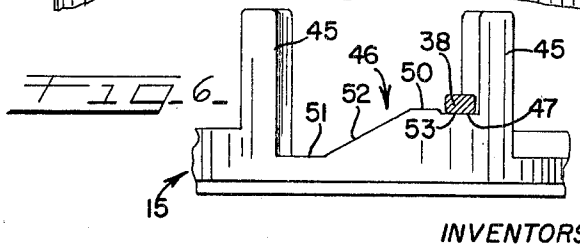


FIG. 5

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AEROSOL DISPENSER

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ABSTRACT OF THE DISCLOSURE

An apparatus for use with a pressurized aerosol-type dispenser which is characterized by an inverted cup-shaped chamber forming cap member adapted to be secured on the top of the container and having openings in oppositely disposed wall portions for passing liquid therethrough so as to raise or lower the temperature of heat transfer elements confined in a housing which is positioned in the fluid accommodating chamber and the interior of which is in communication with the discharge outlet of a valve controlling the dispensing of the product so that when the valve is opened the product will flow through the heat exchanger and emerge from a discharge outlet disposed in a spout provided in the cap member, the cap member being mounted in rotatable and vertically reciprocable relation on a mounting ring on the top of the container and in one position thereof co-operating with the heat exchanger for manually operating the dispensing valve, and co-operating stop means on the cap and mounting ring for limiting the movements of the cap, and lock means for releasably locking the cap in a non-operative position where it cannot be depressed to open the valve.

This invention relates to the dispensing of products from pressurized aerosol-type packages and is more particularly concerned with improvements in dispensing apparatus which incorporates a means for effecting a change in the temperature of the product as it is dispensed.

Aerosol-type dispenser packages have been provided heretofore for products which it is desirable to make available for use at a temperature which differs from the temperature of the package, for example, shaving lather, shampoos and similar products, usually dispensed in the form of a foam. One such package is described in Weidman et al. Patent No. 3,292,823 wherein the container is provided with an inverted cup-shaped chamber forming cap which is fixed on top of the container and encloses a heat exchanger, with a hinge section in the top of the cap which contacts the top of the heat exchanger and operates the discharge valve, when it is depressed, the heat exchanger comprising heat transfer elements enclosed within a container having a connection with the valve outlet so that the product emerging from the outlet passes through the heat exchanger and contacts the heat transfer elements, which, in the case of a shaving lather, raises the temperature according to the temperature of water or other fluid which is passed through the chamber in which the heat exchanger is confined for a predetermined period prior to opening of the discharge valve in the container.

It is a general object of the present invention to provide apparatus for incorporation in an aerosol-type dispenser package which is designed to facilitate the use of a heat transfer device for changing the temperature of the product as it emerges from the discharge valve of the pressurized container.

It is a more specific object of the invention to provide a chamber forming member for mounting on the top of an aerosol container so as to enclose a heat exchanger device and enable the same to be subjected to a fluid of a

different temperature after which the product is passed through the exchanger so as to effect a change in the temperature of the product.

It is another object of the invention to provide in an aerosol-type dispenser package a chamber forming, inverted, cup-shaped cap member which is connected to the top of the package with provision for rotatable and vertical reciprocation and which has inlet and outlet openings in oppositely disposed relation for enabling a fluid to be passed there through so as to raise or lower the temperature of a heat transfer device confined within the chamber, the heat transfer device being disposed in the chamber and being connected to the discharge valve so as to operate the valve upon depression of the cap member when it is in a predetermined rotative position, and the cap member being carried on a mounting ring with guide members and co-operating stop members for limiting the movement of the cap member and for releasably locking the cap member against valve opening movement.

These and other objects and advantages of the invention will be apparent from a consideration of the aerosol-type dispenser package which is shown by way of illustration in the accompanying drawings wherein:

FIGURE 1 is an elevational view of the dispensing side of an aerosol-type dispenser package with a valve operating structure which incorporates the principal features of the invention, with portions of the container broken away;

FIGURE 2 is an elevation of the top portion of the opposite side of the package shown in FIGURE 1;

FIGURE 3 is a sectional view of the top portion of the package shown in FIGURE 1, to an enlarged scale, the view being taken on a vertical plane indicated at 3—3 in FIGURE 1;

FIGURE 4 is a cross section to a smaller scale taken on line 4—4 of FIGURE 3 with the heat exchanger being omitted;

FIGURE 5 is an exploded, perspective view showing the structure at the top portion of the package of FIGURE 1; and

FIGURE 6 is a fragmentary elevation, to an enlarged scale, showing a portion of the cap mounting ring structure, the view being taken on the plane indicated at 6—6 in FIGURE 4.

Referring to the drawings, there is illustrated a pressurized aerosol-type package having mounted on the top thereof a valve control structure which embodies the principal features of the invention, the package being designed for dispensing products such as shaving lather, shampoos, or the like, where it is desirable to change the temperature of the product as it is dispensed, in a simple and convenient manner as, for example, by incorporating in the apparatus a heat exchange device, the temperature of which may be changed by holding it for a relatively short period in a liquid of a different temperature such as the hot water from an ordinary bathroom faucet or the like.

The apparatus which is illustrated comprises three members which are assembled and mounted on the top of an aerosol container **10** within which the product to be dispensed is contained together with a propellant material under pressure so that operation of a valve mechanism **11** which is mounted in the top of the container **10** results in the discharge of the product mixed, or carried by the propellant material through a hollow valve stem **12** projecting upwardly of an island **13** in the center of the container closure cap **14** in which the valve assembly **11** is mounted. The apparatus which provides for control of the operation of the valve assembly **11** and the heating of the product as it is dispensed comprises an inner base or mounting ring member **15**, a shroud-like

outer cap or top member **16** and a heat exchanger device **17**. The cap member **16**, which is of inverted cup-shape form, and which provides a chamber **18** within which the heat exchanger **17** is confined, is mounted for rotational and vertical movement on the mounting ring **15** which is in turn secured in fixed relation to the bead-like seam **20** connecting the rim of the closure member **14** to the mouth of the container **10**. The heat exchanger **17**, which is adapted to be loosely locked in the chamber **18**, comprises a cylindrical container or housing **22** having heat transfer elements (not shown) therein which is provided with a pocket forming recess **23** in the bottom wall **24** in which the top of the valve stem **12** is adapted to be seated. An opening **25** in the center of the pocket **23** is disposed so that the product discharged through the valve stem **12** will pass into the housing **22** and be discharged therefrom through a spout **26** extending radially at the top of the container **22**. The valve assembly **11** which is, of course, normally closed, is opened for the discharge of the product through the valve stem **12** upon depressing the heat exchanger **17**.

The chamber forming top cap member **16** (FIGURE 3) has a relatively large opening **30** in the back side wall and openings **31** and **32** in the front side wall and the top wall, respectively. The openings **31** and **32** are disposed opposite the opening **30** and are below and above a spout **33** projecting forwardly of the front wall of the cap member **16** through which the product is directed by the spout **26** on the heat exchanger **17**. Reinforcing struts **34** form a grid-like arrangement in the spout **33**. The top wall **35** of the cap member **16** is spaced above the top wall of the heat exchanger **17** and carries depending lugs **36** on the bottom face thereof which extend to a short distance above the top wall of the heat exchanger **17** and which are engageable with the same so as to depress the heat exchanger **17** upon the application of downward pressure on the top wall **35** of the cap member **16**. The open bottom face of the cap member **16** is of larger diameter than the maximum diameter of the mounting ring **15** so that the side walls telescope over the same and the cap member **16** is free to move vertically within limits defined by a series of peripherally spaced, radially inwardly extending lugs **37** which project beneath the margins of the ring member **15** and lock the cap member onto the same and the vertically spaced stop members **38** which extend inwardly in peripherally spaced relation about the interior of the side wall of the cap member **16**. The radially extending lugs **38** have a dual function which will be hereinafter described.

The mounting ring or inner base member **15** which mounts the apparatus on the container **10** has a central opening **40** through which the valve stem **12** extends and a downwardly facing, peripherally extending recess **41** which receives the rim member **20** so that the ring member **15** may be frictionally secured thereon. The ring member **15** may be held against rotation about the axis of the container **10** by a small lug **42** on the rim of the closure member **14** extending radially into a radial slot **43** in the bottom of the ring member **15**. Two pairs of post forming members **45** extend upwardly of the top face of the ring member **15**, at the margins of the latter, which are disposed on opposite sides thereof and spaced from each other. When the cap member **16** is assembled with the mounting ring member **15** the posts **45** are disposed immediately within the side walls of the cap **16** and provide vertical surfaces forming a guide for movement of the cap **16** in both rotational and vertical directions. Cam track forming sections **46** are provided at three points spaced about the periphery of the mounting ring member **15** which are provided for co-operation with the cam follower surfaces **47** on the bottom face of each of the radial lugs **38** on the inner wall of the cap member **16**. Each cam section **46** comprises an upper surface or track portion **50** and a lower track portion **51** with an inclined connecting portion **52**. The lowermost track portion or section **51** is located substantially below the top face of the ring member **15** and provides clearance for the associated lug follower **38** to permit the cap **16** to be depressed sufficiently to open the valve **11**. The top portion **50** of the cam track is divided into two sections with the section remote from the tapered portion **52**, indicated at **53**, being in a slightly lower plane so that when the cam follower surface **47** rides up on the inclined portion **52** and across the top track portion it drops into the track portion **53** and is locked against both rotational and vertical reciprocal movement. In this position the lugs **38** are held so that the cap member **16** cannot be depressed to operate the valve **11**. The difference in elevation between the two top track portions is relatively small and the lugs **38** can be sprung out of the depressed track portions **53** by application of sufficient rotational torque so as to free the cap **16** for rotational movement to the position where the lugs **38** are above the lowermost track portion **51** and vertical movement for operation of the valve is permitted. The cap member **16** is provided with a ribbed portion **55** on the top face to indicate where pressure should be applied to depress the cap and appropriate indicia is printed on or otherwise applied to the top surface to indicate the direction of rotation to place the cap member **16** in the locked position and in the open position which permits operation of the valve **11**.

The top or cap member **16** and the mounting ring **15** may be fabricated of a suitable molded plastic having the necessary heat resistance characteristics and the durability required so as to withstand temperature changes and the abuse which may be expected in use. In the assembly of the apparatus the mounting ring may be secured on the container top and the heat exchanger **17** positioned on the valve stem **12** after which the cap **16** may be telescoped over the posts **45** and forced down into locked position with the lugs **37** having sufficient resilience to spring by the marginal edge of the ring **15** and snap beneath the same. This results in the heat exchanger **17** being loosely contained in the cap **16** and the latter being manually rotatable and vertically movable, within the limits determined by the stop members, between valve operating and non-operating positions.

In using the apparatus the cap **16** is rotatable between the open position where it may be depressed to operate the valve **11** for discharge of the product or it may be rotated to the locked position where the lugs **38** are seated in the cam track portions **53** and the cap **16** cannot be depressed so long as it remains in that position. The lugs **38** may be forced out of the depressions **53** by rotation of the cap **16**. The cap openings **30**, **31** and **32**, of course, permit the assembly to be held under a faucet, for example, for the passage of sufficient hot water to raise the temperature of the heat exchanger so that the product will be heated as it passes through the exchanger. Any other source of liquid may, of course, be employed and the product may be heated or cooled depending upon the temperature of the liquid employed.

While particular materials and specific details of construction are referred to in describing the dispenser package, which is illustrated, it will be understood that other suitable materials and equivalent structural details may be resorted to within the spirit of the invention.

We claim:

1. An aerosol-type dispenser package comprising a container adapted to enclose a product to be dispensed and a pressurized propellant, said container having a top closure with a discharge valve mounted therein which includes a hollow valve stem through which the product is discharged when the valve is opened by depressing of the valve stem, a cap mounting ring fixed on the top of said container, and inverted cup shaped cap member having an open bottom seated in telescoping relation for rotational and vertical movement on said mounting ring, said cap member providing a chamber for accommodating a heat exchanger device, said heat exchanger device being mounted on said

valve stem within said chamber, and said cap member having means engaging the heat exchanger device and cooperating therewith, in one position of said cap, whereby to enable the valve stem to be depressed by application of downward pressure on the cap member so as to open the discharge valve.

2. An aerosol-type dispenser package as set forth in claim 1 and said cap member having inlet and outlet openings in oppositely disposed side wall portions thereof for enabling a stream of fluid of a different temperature to be passed through the chamber in which the heat exchanger device is disposed.

3. An aerosol-type dispenser package as set forth in claim 1 and said cap member having side walls which telescope over said cap mounting ring and vertically spaced stop members on the inside of said side walls which limit the vertical movement of said cap member relative to said cap mounting ring.

4. An aerosol-type dispenser package as set forth in claim 3 and said cap mounting ring having means forming vertically extending abutment surfaces cooperating with certain of said stop members for limiting the rotational movement of said cap member.

5. An aerosol-type dispenser package comprising a container adapted to enclose a product to be dispensed and a pressurized propellant, said container having a top closure with a discharge valve mounted therein which includes a hollow valve stem through which the product is discharged when the valve is opened by depressing of the valve stem, a cap mounting ring fixed on the top of said container and an inverted cup shaped cap member seated for rotational and vertical movement on said mounting ring, said cap providing a chamber for accommodating a heat exchanger device and cooperating therewith, in one position of said cap, to enable the valve stem to be depressed by application of downward pressure on the cap so as to open the discharge valve, said cap member having side walls which telescope over said cap mounting ring with circumferentially spaced stop members on the inside face thereof, and said cap mounting ring having upstanding, circumferentially spaced, guide forming post members which cooperate with said stop members to limit the rotational movement of said cap member.

6. An aerosol-type dispenser package comprising a container adapted to enclose a product to be dispensed and a pressurized propellant, said container having a top closure with a discharge valve mounted therein which includes a hollow valve stem through which the product is discharged when the valve is opened by depressing of the valve stem, a cap mounting ring fixed on the top of said container and an inverted cup shaped cap member seated for rotational and vertical movement on said mounting ring, said cap providing a chamber for accommodating a heat exchanger device and cooperating therewith, in one position of said cap, to enable the valve stem to be depressed by application of downward pressure on the cap so as to open the discharge valve, said cap member having depending side wall portions which telescope said cap mounting ring, lug members extending inwardly of said side wall portions in vertically spaced relation which limit the vertical movement of said cap member, and said cap mounting ring having means forming cam tracks which cooperate with certain of said lug members to control the vertical movement of said cap member.

7. An aerosol-type dispenser package as set forth in claim 6 and said cam tracks forming means having an uppermost track portion which is divided so as to form on one part thereof, a seat for releasably locking therein certain of said lug members so as to hold the cap in an

elevated position and prevent operation of the discharge valve.

8. An apparatus for mounting on the top of an aerosol-type container which is adapted to enclose a pressurized product to be dispensed and which has a dispensing valve supported in the top thereof with an upstanding hollow valve stem through which the product is discharged when the valve is opened by depressing the valve stem, said apparatus comprising a mounting ring member adapted to be seated on the top of the container so as to encompass the upstanding valve stem and a cap member of inverted cup shape form having an open bottom which is adapted to be disposed with the side walls thereof telescoping over the mounting ring so as to have a limited vertical movement and to form a chamber for receiving a heat exchanger device, said heat exchanger device being mounted within said chamber so that when downward force is applied to the top of the cap member the heat exchanger device will depress the valve stem and open the valve for discharge of the product.

9. An apparatus as set forth in claim 8 and said mounting ring member having a center opening through which said valve stem is adapted to extend and a recess in the bottom face adapted to receive in frictional engagement a sealing bead formation on the top of the container.

10. An apparatus as set forth in claim 8 and said cap member having openings in oppositely disposed relation in the side walls which permit a fluid to be passed through the chamber in which the heat exchanger device is received so as to enable the temperature of the heat exchanger device to be changed by subjecting it to a stream of fluid of a different temperature.

11. An apparatus as set forth in claim 8 and cooperating cam means on the cap member and mounting ring member for limiting the vertical movement of the cap member and for releasably locking the same in a position which prevents opening of the dispensing valve.

12. An apparatus as set forth in claim 8 and cooperating cam track and cam follower means on the mounting ring member and the inner wall of the cap member, respectively, for controlling the vertical movement of the cap member.

13. An apparatus as set forth in claim 12 and said cam track means having a portion on which the cam follower means is adapted to be seated so as to releasably lock the cap member against rotation when it is in a raised position where it cannot be depressed to open the dispensing valve.

14. An apparatus as set forth in claim 12 and said cam track means having a portion forming a pocket in which the cam follower means is adapted to be seated so as to releasably hold the cap member against rotation and in an elevated position which prevents operation of the dispensing valve by pressure applied to the top of the cap member.

References Cited

UNITED STATES PATENTS

3,171,572	3/1965	Reich et al.	222—146
3,185,350	5/1965	Abplanalp et al.	222—402.11
3,273,610	9/1966	Frost	222—402.13 X
3,291,346	12/1966	Marraffino	222—146 X
3,175,733	3/1965	Lerner	222—146

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