This invention generally relates to center-push lever type release mechanisms for aerosol containers for foods and the like in which pressurized fluid within the container may be released upon activation of a center-push valve from the exterior of the container. More specifically, the invention is directed to a foam valve release mechanism comprising a single-piece lever and pin-push unit removable mountable over the center-push valve of an aerosol container.

The present invention contemplates the use of a rounded or hemispherical cap which removably snaps onto the end rim of an aerosol container, the cap being formed from a semi-rigid material which is somewhat flexible and yieldable. A valve actuating or release pin depends downwardly from the inside center portion of the cap and on the outside of the cap, a manually operable lever member protrudes radially away from the center thereof. The cap also defines a outlet nozzle for the contents of the container. The primary novelty resides in the fact that the lever tends to flex the entire top or central portion of the cap when worked downwardly, so that the pin is also pushed downwardly to engage the center push valve. Further novelty resides in the use of snap-on means under the lever permitting ready removal of the entire cap from the aerosol can for cleaning and subsequent replacement of the cap for further dispensing of the product.

Conventional aerosol release mechanisms for foam products normally include a tube extending inwardly within the can to the bottom thereof so that the fluid can be sprayed or discharged therefrom in the right-side-up position. The release mechanism is inseparable from the can so as to prevent ready cleaning. The device of the present invention is primarily designed for discharge of food materials directly onto a plate with a center-push operation; that is, the container is held upside down so that the plate need not be tipped. This is particularly desirable such as in hospitals and the like, where an attendant dispenses certain foods, such as creams, and the like onto plates being filled on an assembly line basis, so as to dispense with the need for spoons, messy pitchers, bowls and the like. A further advantage is that the present mechanism, being integral and without hard-to-reach areas, may be easily removed and cleaned after each meal.

Accordingly, an object of the invention is to provide a one-piece center-push lever type release mechanism for aerosol containers as above described. Another object of this invention is to provide such a mechanism made from a form-retaining, yet flexible material which may be yieldably depressed to contact and activate a center-push release valve.

A further object of the invention is to provide a mechanism of the character described which may be readily detached from the container and cleaned, and then readily reattached to the container.

Yet another object of the invention is to provide a mechanism of the above type which is extremely simple in construction and operation and which may be commercially produced on a large scale basis.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification.

It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims.

FIGURE 1 is a side elevational view (partly in cross-section) of the center-push lever release mechanism of the present invention shown operatively mounted on one end of an aerosol container having a center-push valve therein.

FIGURE 2 is a view similar to FIGURE 1 in which the mechanism is shown in its valve activating position for the dispensing of product from the container.

FIGURE 3 is a perspective view of the exterior portions of the cap which includes the lever release mechanism.

FIGURE 4 is a side elevational view of the cap (as viewed from line 4-4 of FIGURE 3).

FIGURE 5 is a bottom plan view of the cap.

FIGURE 6 is a bottom plan view of a modified form of cap construction.

Referring now more particularly to the drawings, there is shown in FIGURE 1 a generally cylindrical conventional type of aerosol container 11 upon the upper end of which is secured a dished top 12. The upper end of the top 12 is outwardly rolled to provide a bead 13, such bead defining an upper opening 14 of the container. An annular ring 16 extends downwardly from the plane of the opening 14, such ring having its upper end 17 rolled over the bead 13 for rigid attachment thereto. The lower end of the ring is flanged to provide a lock seam 18 with the inwardly directed lower end portion of a dished valve closure plate 19 whose upper central portion is positioned vertically intermediate the lock seam 18 and bead 13. Plate 19, together with ring 16 and top 12 provide a closure for the container. However, to permit dispensing of the container contents, the center portion of plate is provided with an aperture 22 which may be provided with an annular reenforcement 23 which, as will be presently explained serves as a valve seat.

Supported on lock seam 18, and extending diametrically across the same is a strap 24 formed of flat spring-like material, and provided with depending corrugations 26 for added strength. The center portion of strap 24 is provided with a ball-like projection 27 in the nature of a valve, and in the normal position of the parts, the valve 27 is seated against the valve seat 23 so as to seal the aperture 22. It will be understood, however, that due to the resiliency of strap 24, the latter may be flexed downwardly so as to cause a movement of the valve 27 away from valve seat 23 and thus permit the pressurized contents in the container to be discharged through the aperture 22. It should be made clear that the foregoing type of construction is generally known in the art, and provides the environment for the valve actuating cap mechanism of the present invention.

In accordance with the teachings of this invention, there is provided a flexible single-piece integral cap member 31 having a flat top 32 and a downwardly flanged rim or skirt 33 depending from the outer periphery thereof. The bottom of the skirt is provided with a continuous groove 36 of a size to snugly receive the bead 13. A groove 37 is also provided in the side wall of the skirt for the purpose of receiving a closure member (not shown) which will releasably seal the entire cap assembly. A plurality of circumferential inwardly extending elongated cleats 38, shown in FIGURE 5, are disposed on the bottom inside of skirt 33, and may snap under the ring 17 and prevent accidental dislodgment of the cap.

Depending from the center of the flat top 32 is a valve actuating member in the form of a pin 39 which is dis-
posed to rest slightly above plate projection 27. Thus, if the central portion of the cap is caused to be deformed downwardly (as shown in FIGURE 2), the pin 39 will engage the valve 27 and force the same out of sealing engagement with aperture 22 and permit discharge of the container contents.

To facilitate the depression of the cap, and consequent actuation of the valve mechanism, the upper surface of the cap is provided with an integral horizontally extending lever member 41. The lever is provided with an extension 42 spaced from the upper cap surface 32 radially outwardly from the center thereof, such extension being preferably provided with a reinforcing rib 43 depending from the underside thereof.

To complete the cap construction, it will also be noted that adjacent the cap periphery there is provided a vertically extending spout 46 in communication with an opening 47 in the cap which provides a discharge means for the product upon valve actuation.

Cap member 31 may be formed from any flexible, yieldable material which retains its shape once pressure is released therefrom. One preferred material is polyethylene. However, to some extent, the thickness of the top 32 of the cap will depend upon the flexibility of the material, since the top should not yieldably deform except under such pressure as is intentionally placed upon the lever 41. In this regard, it should be noted that the release mechanism could still be operated by pressure applied directly against the top 32 alone, although much more pressure would be required without the lever. Operation of the valve is illustrated in FIGURE 2 in which lever 41 is shown in a manually depressed position with the center portion of the cap top 32 similarly depressed, so that pin 39 presses against valve 27 to thereby deflect plate 24, whereby contents of container 11 are free to flow through aperture 22, opening 47, and then out of spout 46. When the lever is released, the cap and plate return to their normal closed position shown in FIGURE 1.

The particular configuration of the preferred embodiment of cap 31 may be seen upon examination of FIGURE 3, the width of the lever 41 being less than the radius of the cap, and the end thereof being within the peripheral extent of the cap. The lever lies on a diameter of the cap on which the nozzle spout 46 is located. In FIGURE 6 a slightly modified form of cap is provided wherein the cleats may be in the form of small inwardly extending dimples 51 which permit greater ease in removing cap 31 than the cleats 38. The elongated cleats 38 require a great deal of additional force to remove the cap and are therefore preferred where the cap is intended to be relatively permanently mounted on the container, while the short cleats 51 are preferred when the cap is to be regularly removed for cleaning. However, in either case, an elongated cleat is preferred adjacent the spout side of the cap to prevent dislodgment of the cap upon depression of the lever.

What is claimed is:

1. An aerosol container having an upper open end provided with a peripheral bead, a closure member closing said open end and having a discharge opening, and resilient valve means underlying and normally closing said discharge opening; the combination therewith of a cap member having a top portion disposed in spaced relation to said closure member and an integral peripheral skirt portion engaging said container bead on both the inner and outer peripheral portions thereof, said cap member having a product outlet extending from said top portion and further having a valve actuator element formed integrally with and depending from said top portion and adapted to move said valve means out of closing engagement with said discharge opening when pressure is applied to the upper surface of said cap.

2. Apparatus as set forth in claim 1 in which said top portion forms a continuous upper wall, and said skirt is provided with a downwardly opening groove for receiving said bead.

3. Apparatus as set forth in claim 1 in which said cap member is provided with an integral horizontally disposed lever extending radially of and from the upper surface of said top portion and manually operable to effect deflection of said cap member and actuation of said valve means.

4. Apparatus as set forth in claim 3 in which said peripheral skirt is provided with an elongated inwardly directed cleat adapted to underlie said bead along the radius of said lever so as to resist upward movement of said cap member upon depression of said lever, and at least one shorter cleat on the other side of said skirt permitting deliberate removal of said cap member by upward movement of said lever.

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