

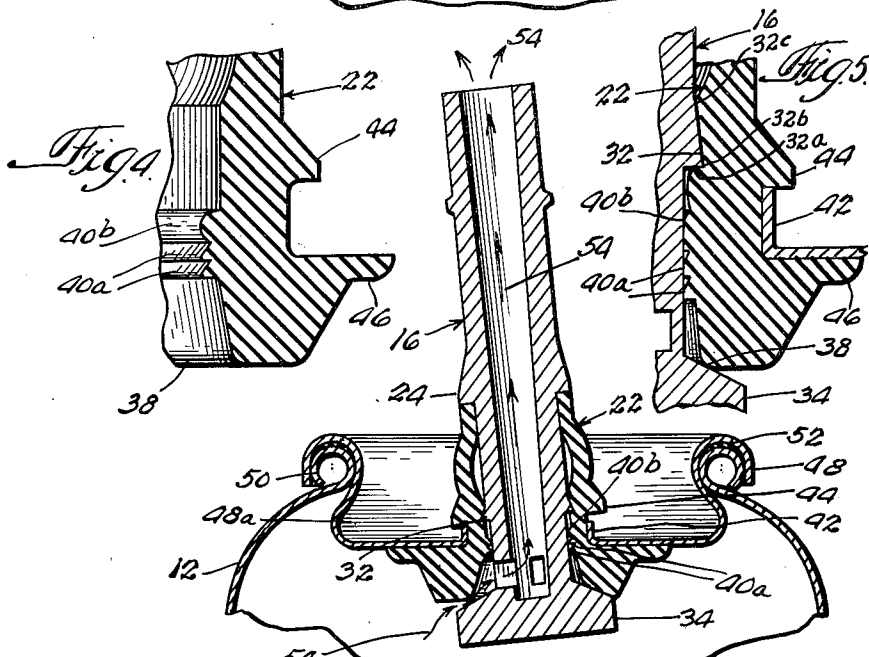
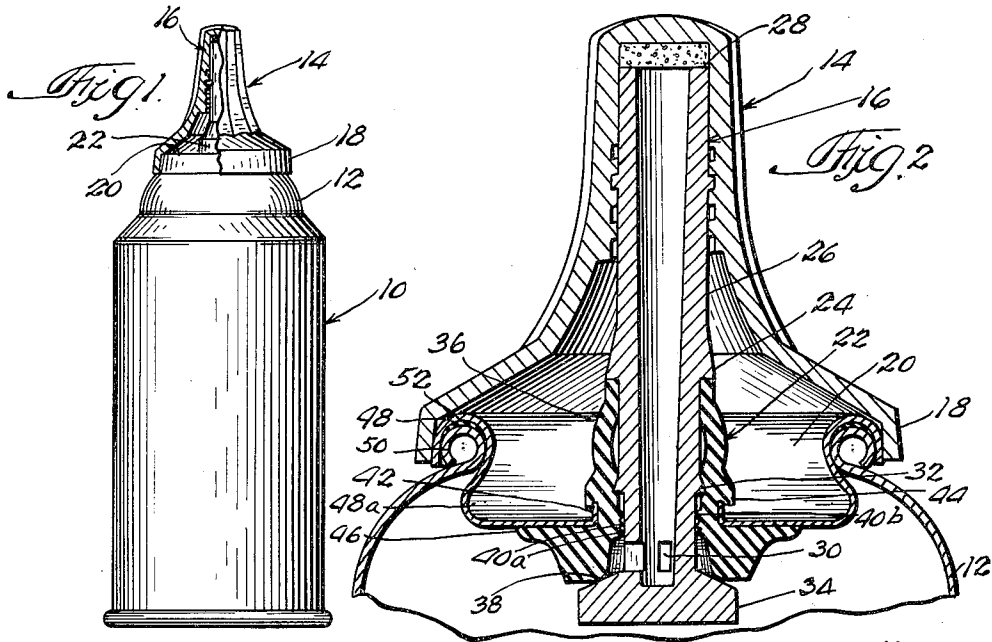
Aug. 7, 1962

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3,048,307

DEVICE FOR DISPENSING AERATED PRODUCTS

Filed Aug. 24, 1959



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3,048,307
DEVICE FOR DISPENSING AERATED PRODUCTS

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 Filed Aug. 24, 1959, Ser. No. 835,628
 8 Claims. (Cl. 222-394)

This invention pertains to devices for dispensing aerated products from pressurized containers and more particularly to an improved valve construction provided with a closure guard for maintaining releasable sealing engagement between the valve plug and the seat.

Heretofore such dispensing devices for shaving cream, toothpaste, or whipped cream and the like have been susceptible to accidental dislodgment of the nozzle, or adjutage, and have included various mechanisms for maintaining the adjutage securely positioned through a container wall or lid. Particular elements in addition to a basic assembly comprising a cap, an adjutage, a resilient plug and a mounting cup have been required, thus complicating or increasing the difficulty of putting such an assembly together. Even recent devices, when fabricated from flexible materials such as rubber and pliable plastics strong enough to secure the adjutage in position on the container without additional parts have shown that the adjutage or the surrounding resilient plug is frequently broken or cracked unless the device is painstakingly assembled.

It is therefore one object of this invention to provide an improved valve construction in which an adjutage may be securely maintained in position on a pressurized container.

Another object of this invention is to provide an improved valve construction in which an adjutage may be mounted on a pressurized container in secure fluid-sealing engagement using a minimum number of parts.

Yet another object of this invention is to provide an improved valve construction which may be simply assembled without danger of adjutage or resilient plug breakage and which guards against accidental adjutage dislodgment after assembly.

A further object of this invention is to provide an improved valve construction in which a readily flexible resilient member and mounting cup cooperatively engage and securely affix an adjutage on a pressurized container.

A still further object of this invention is to provide an improved valve construction in which a series of sealing blade members within a sleeve assist in securing an adjutage on a pressurized container and also facilitate pivotal operation of the adjutage.

Other objects and advantages will become more apparent from the following detailed description.

According to one embodiment of this invention, there is provided a device for dispensing aerated products comprising a resilient sleeve having a valve seat at one end, an adjutage positioned through the sleeve, shoulder means on the adjutage wedged within the sleeve, and a valve plug adjacent one end of the adjutage in releasable sealing engagement with the valve seat.

The details of one embodiment will be clear from the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is an elevational view of a container in which the dispensing device of this invention is incorporated;

FIG. 2 is an enlarged sectional view of a dispensing device illustrating one embodiment of this invention;

FIG. 3 is a sectional view of the device illustrated in FIG. 2, showing the adjutage in one position for discharge;

FIG. 4 is an enlarged sectional view, partly in per-

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spective, of a portion of the resilient member shown in FIG. 2, and

FIG. 5 is an enlarged sectional view of a portion of the resilient member engaged with the adjutage as shown in FIG. 2.

Referring more particularly to the drawings, a container 10 is provided having a lid portion 12 and a protective cap 14 affixed over adjutage 16. The cap may be of any esthetic configuration but ordinarily skirt portion 18 extends about the top of the container and overlaps the outer edges of a mounting cup 20. An elongated resilient member 22, especially adapted for insertion through an aperture in the mounting cup, engages both the cup and the adjutage to complete the assembly of the container and dispensing device.

An upper or first shoulder means 24 is formed on the tubular body portion 26 of the adjutage intermediate open end 28 and transversely apertured end 30. Second shoulder means 32 is formed on tubular body portion 26 intermediate the first shoulder means and the transversely apertured end. Valve plug 34 adjacent end 30 may be integrally formed therewith, as has been found preferable, by any appropriate molding process.

The elongate resilient member 22, which may be made of soft plastic, rubber, or any desirable material, is centrally apertured and comprises a sleeve portion 36 having a valve seat portion 38 on one end. Flexible annular blades 40a and 40b are disposed within the sleeve portion and encompass the inner perimeter thereof adjacent the valve seat portion.

The apertured mounting cup 20, secured to the lid portion 12 of the container, has a sleeve-engaging flange 42 positioned about the edges of an aperture in its bottom. Thus the outside of sleeve portion 36 is snugly engaged by flange 42, and externally situated shoulder 44 laps over the flange when web 46 is sealingly seated against the interior surface of the mounting cup.

The dispensing device is assembled by pushing the sleeve portion 36 of resilient member 22, through the aperture in the bottom of the mounting cup until shoulder 44 is engaged over flange 42 and web 46 is flush against the surface of the mounting cup. Thereafter end 28 of the adjutage is inserted into the valve seat portion 38 of resilient member 22 and forced through until valve plug 34 is positioned against valve seat portion 38. Sleeve 36 is then compressed along its longitudinal axis until the sleeve end opposite seat 38 receives first shoulder means 24 thereby maintaining the resilient member 22 in longitudinal compression which urges the valve plug 34 toward releasable sealing engagement with the valve seat. The second shoulder means 32 compresses an adjacent portion of the sleeve 36 and is wedged therein.

When the device is assembled, second shoulder means 32, of larger diameter than the sleeve's central aperture, is wedged against the inner walls of the sleeve portion and cooperates with first shoulder means 24 to restrict longitudinal movement through resilient member 22, thus guarding against accidental dislodgment of the adjutage and consequent separation of the valve plug from the valve seat. The second shoulder means 32 is disposed on the adjutage in spaced relation to the valve plug 34 and is positioned within the sleeve adjacent to the flange of the mounting cup. As shown particularly in FIG. 5, an annular face 32a of the second shoulder means extends outwardly from the adjutage in a plane substantially normal to the longitudinal axis of the adjutage to form a sharp edge 32b with a second face 32c of the second shoulder means, the second face extending from the annular face in a direction away from the valve plug, and forming a relatively smooth outer surface with the adjutage. The second shoulder means is therefore readily movable within the sleeve in a direction away from valve seat 38, but the

sharp edge 32b formed by the intersecting annular and second faces of the second shoulder means engages the inner wall of the sleeve to oppose movement of the said second shoulder means within the sleeve toward the valve seat. Furthermore, sleeve 36 is compressed between second shoulder means 32 and flange 42. Such compression opposes any force exerted inwardly on adjutage 16 and increases with any inward movement of the adjutage to further resist accidental dislodgment of the valve plug.

The assembled dispensing device may be affixed to a container by suitable fluid-sealing means, such as shown in FIG. 2 of the drawing: a flange portion 48 of mounting cup 20 is placed over bead 50 on container 10 with a resilient sealing material 52 included to effect a liquid-tight joint. The cup is then spun radially outward in the portion 48a to form a tight seal. Although ordinarily a mounting cup may be used to facilitate mounting the adjutage and resilient member on a container, it is contemplated that such a cup may be eliminated, and the container, with the adjutage and resilient member mounted in one of the walls, may be sealed at another point such as, for instance, at the bottom.

In order to dispense the contents of the container, adjutage 16 may be tilted radially, as shown in FIG. 3, thus opening the valve to permit the contents to escape under pressure through transversely apertured end 30, tubular body 26 and open end 28 as indicated by the direction of arrows 54.

Without intending to limit the invention disclosed herein, excellent results have been obtained when the adjutage is formed having an outer diameter of .360 inch at the first shoulder means with a step-down to .250 inch outer diameter between the first and second shoulder means. The inner diameter of sleeve 36 is .248 inch in the area immediately above blade 40b thus requiring second shoulder means 32 on the adjutage to be wedged within the sleeve.

Blades 40a and 40b annularly encompass the inner walls of sleeve 36 and are especially formed to prevent leakage from the container. They also facilitate tilting of the adjutage while reflected compression is transmitted from the flange. Girdling the centrally located aperture in the sleeve, sharp edged blades 40a, closest to the valve seat, are positioned about the adjutage such that each is inclined toward the valve plug and their edges grasp the adjutage intermediate the transversely apertured end 30 and second shoulder means 32. Blade 40b with an arcuate face is located adjacent the blades 40a and opposite flange 42 around the mounting cup aperture. When the adjutage is tilted the arcuate face of blade 44b, through which the fulcrum function of flange 42 is effected, provides a bearing across which the adjutage may be readily tilted.

Blades 40a and 40b cooperate during the tilting operation as well as at all other times to prevent leakage from the container by providing a multi-lipped barrier against flow or seepage of the container's contents. Moreover, the arcuate surface of blade 40b cooperates with the opposite resistance of flange 42 and permits all blades to flex slightly upon the tubular body rather than release or slip along the adjutage when the latter is accidentally jarred, thus assisting the second shoulder means wedged against the inner walls of resilient member 22 in maintaining the adjutage securely in position.

Others may, by applying current knowledge, readily adapt the invention explained above while retaining certain features which may properly be said to constitute the essential items, which items are intended to be secured by the following claims.

I claim:

1. A device for dispensing aerated products comprising a container for said products, a mounting cup affixed to said container, a flange disposed on said mounting cup and arranged about a sleeve receiving aperture in said cup, a re-

silient sleeve positioned through said sleeve receiving aperture in said mounting cup and having a valve seat at one end positioned on the inward side of said cup, an adjutage extending through said resilient sleeve, said adjutage including a valve plug at one end disposed in releasable sealing engagement with said valve seat and a shoulder means spaced from said valve plug and wedged within said sleeve, said flange engaging the outside of the sleeve and so constructed and arranged that the sleeve is compressed between the flange and the shoulder means, said shoulder means having an annular face spaced from the valve plug and extending in a plane substantially normal to the longitudinal axis of the adjutage, said shoulder means also having a second face extending from said annular face away from said valve plug to form a relatively smooth outer surface with the adjutage and readily movable within the sleeve in a direction away from the valve seat, said second face of the shoulder means also abruptly intersecting said annular face to form a sharp edge for engagement with the inner wall of the sleeve and opposed to movement of the shoulder means within the sleeve toward the valve seat.

2. A device for dispensing aerated products comprising a container for said products, a mounting cup affixed to said container, a flange disposed on said mounting cup and arranged about a sleeve receiving aperture in said cup, a resilient sleeve positioned through said sleeve receiving aperture in said mounting cup and having a valve seat at one end positioned on the inward side of said cup, an adjutage extending through said resilient sleeve, said adjutage including a valve plug at one end disposed in releasable sealing engagement upon said valve seat, a shoulder means spaced from said valve plug and wedged within said sleeve, and annular blades within the sleeve about the adjutage, said flange engaging the outside of the sleeve and so constructed and arranged that the sleeve is compressed between the flange and the shoulder means, said shoulder means having an annular face spaced from the valve plug and extending in a plane substantially normal to the longitudinal axis of the adjutage, said shoulder means also having an inclined face extending from said annular face away from said valve plug to form a relatively smooth outer surface with the adjutage readily movable within the sleeve in a direction away from the valve seat, said inclined face of the shoulder means also abruptly intersecting said annular face to form a sharp edge for engagement with the inner wall of the sleeve and opposed to movement of the shoulder means within the sleeve toward the valve seat.

3. The device of claim 2 in which one annular blade farthest from the valve seat has an arcuate face.

4. The device of claim 3 in which at least one annular blade intermediate the valve seat and the blade having an arcuate face is inclined toward the valve plug on the adjutage.

5. The device of claim 3 in which the blade having an arcuate face is opposite the flange engaging the outside of the sleeve.

6. A device for dispensing aerated products from a container comprising a mounting cup, a flange defining a sleeve receiving aperture through said mounting cup, a resilient sleeve positioned through the aperture having a first shoulder engaging portion at one end and a valve seat at the other end, an adjutage positioned through the sleeve having a first shoulder means disposed upon the first shoulder engaging portion of the sleeve and a valve plug in releasable sealing engagement with the valve seat, adjutage second shoulder means wedged within the sleeve adjacent engagement of said sleeve by said flange and so constructed and arranged that the sleeve is radially compressed between the flange and the second shoulder means, said sleeve being longitudinally compressed between the valve plug and the first shoulder engaging means and being bulged outwardly from the adjutage intermediate the first and second shoulder means, and

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a plurality of annular blades disposed within the sleeve and engaging the adjutage intermediate the second shoulder means and the valve plug, said second shoulder means having an annular face opposite the valve plug and extending in a plane substantially normal to the longitudinal axis of the adjutage, said second shoulder means also having an inclined face extending from said annular face away from said valve plug to form a relatively smooth outer surface on the adjutage readily movable within the sleeve in a direction away from the valve seat, said inclined face of the second shoulder means also abruptly intersecting said annular face to form a sharp edge for engagement with the inner wall of the sleeve and opposed to movement of the second shoulder means within the sleeve toward the valve seat.

7. A device for dispensing aerated products from a container comprising a mounting cup, a flange defining an aperture through said cup, a resilient sleeve extending through the aperture and engaged upon the flange, said sleeve having a first shoulder engaging portion on one side of the cup and a valve seat on the other side of the cup, an adjutage extending through the sleeve having a first shoulder disposed upon the first shoulder engaging portion of the sleeve and a valve plug in releasable sealing engagement with the valve seat, an adjutage second shoulder wedged within the sleeve, said second shoulder and flange being proximately arranged to radially compress the sleeve therebetween, said sleeve also being longitudinally compressed between the valve plug and the first shoulder to form a sleeve portion bulged outwardly from the adjutage intermediate the first and second shoulders, and a plurality of annular blades having sharp edges independent from one another at the outer extremities thereof disposed within the sleeve and engaging the adjutage in sealing engagement therewith intermediate the adjutage second shoulder and the valve plug.

8. A device for dispensing aerated products from a container comprising a mounting cup disposed in a wall of the container, a flange defining an aperture through

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said cup, a resilient sleeve extending through the aperture, said sleeve having a first shoulder engaging portion outside the container and a valve seat inside the container, an adjutage extending through the sleeve and having a first shoulder disposed upon the first shoulder engaging portion of the sleeve and a valve plug positioned against the valve seat, said sleeve being longitudinally compressed against the first shoulder to form an outwardly bulged portion of the sleeve intermediate the first shoulder and the flange for maintaining releasable sealing engagement of the valve plug against the valve seat, a plurality of annular blades having sharp edges independent from one another at their outer extremities disposed within the sleeve and about the adjutage to provide flexible sealing engagement between the adjutage and the sleeve intermediate the valve plug and said bulged portion, and an adjutage second shoulder wedged into the inner wall of the sleeve intermediate the blades and the first shoulder engaging portion and proximately arranged with respect to the flange to radially compress the sleeve therebetween in opposition to movement of the adjutage along the longitudinal axis thereof toward the valve seat, said second shoulder having an annular face opposite the valve plug and an inclined face sloped divergently from the longitudinal axis of the adjutage in a direction toward the valve plug to abruptly intersect said annular face and forming therewith a sharp outer extremity on said second shoulder.

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