Sept. 13, 1966 H. G. LEHMANN 3,272,406

DIRECTIONAL APPLICATOR FOR HAND-HELD DISPENSERS

Filed Oct. 26, 1964

Fig. 1

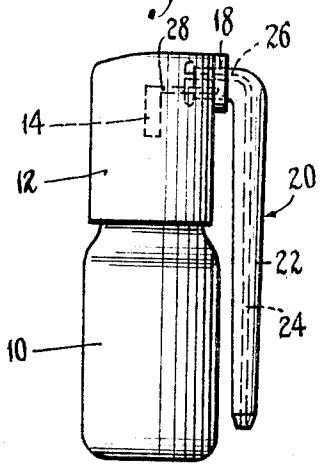


Fig. 2

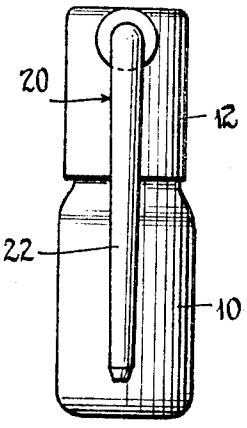


Fig. 4

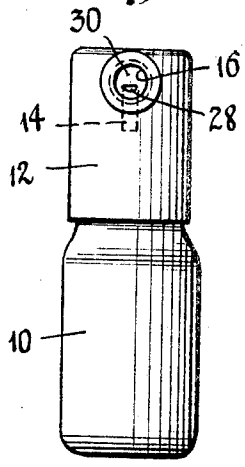


Fig. 3

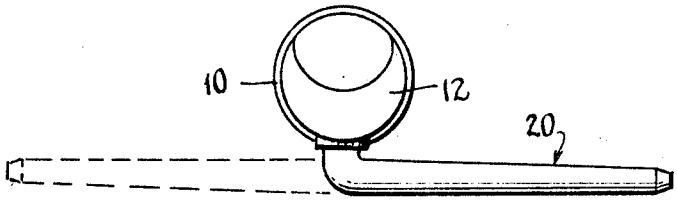


Fig. 5 Fig. 6

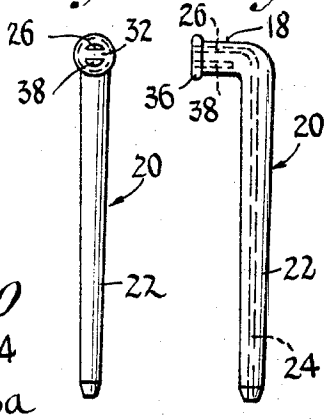


Fig. 8

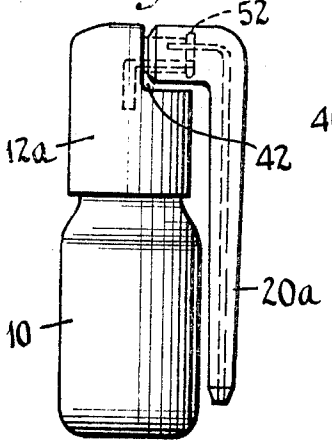


Fig. 9

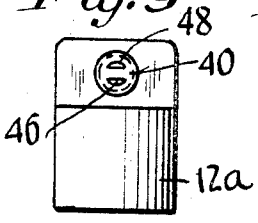


Fig. 10

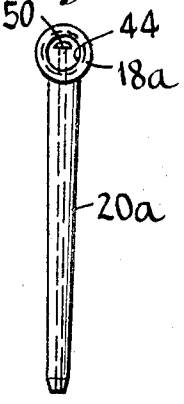
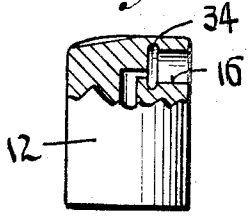


Fig. 7



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DIRECTIONAL APPLICATOR FOR HAND-HELD DISPENSERS

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4 Claims. (Cl. 222—531)

This invention relates to small dispensers for liquids, and more particularly to directional applicator caps for the same.

The invention concerns improvements in the directional applicator cap of U.S. Patent No. 3,148,806 issued to Philip Meshberg and in the directional cap of copending patent application Serial No. 315,070 filed October 9, 1963, now Patent No. 3,221,950, in the name of William R. O'Donnell, which application is owned by the same assignee as the present invention and application.

These prior applicator caps involve an L-shaped directable spout member which is pivotally mounted in a depressible cap part. The cap includes a discharge passage which communicates with the hollow depressible valve stem of the dispenser, and the L-shaped spout is at all times in communication with the discharge passage of the cap, regardless of its rotative or pivotal position. Thus, slight residual liquid which collects in the discharge passage of the cap can ultimately work its way out through the spout member after each use, and this is especially true if the valve of the dispenser has a tendency to leak. These prior devices also are arranged with external means by which depressing movement of the cap is prevented when the spout is in the folded, inoperative position, but such means has no remedial effect upon a slightly leaking valve. The prior devices are also so constituted that the spout can work itself loose from the cap by sliding out of the bearing provided therein.

In accordance with the present invention there is provided, responsive to the rotative or pivotal position of the spout member, an additional valve means which closes the discharge passage when the spout member is in the folded, inoperative position. Further, detent means are provided to retain the pivotal spout member in its properly seated position on the cap at all times, preventing inadvertent looseness, leakage or removal of the spout. The additional valve means is provided not only for a construction wherein the stem of the spout is fitted into the cap, but also for a construction wherein the cap has a hub which is fitted into the spout, and this is also true of the detent means.

Accordingly, an object of the invention is to provide a novel and improved actuator cap having a directable nozzle piece and an auxiliary shut-off device or valve which operates in response to movement of the nozzle, wherein the construction is especially simple and economical to produce as well as being effective and particularly leakproof.

A further object of the invention is to provide an improved actuator cap as above set forth, wherein simplified detent means are provided to maintain the additional shut-off or valve device in operative condition at all times, and to normally retain the spout member in the proper operative relationship with respect to the cap.

A feature of the invention resides in the provision of an improved directional actuator cap in accordance with the foregoing, wherein the bearing portion of the nozzle may be inserted in the cap, or else wherein a bearing portion of the cap may be inserted in the nozzle, whichever construction may be found most desirable and advantageous.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference are used to designate like components throughout the several views, in which:

FIG. 1 is a side elevational view of a pressurized aerosol dispenser and directional applicator cap as provided by the invention, the directional spout being shown in the folded, inoperative position.

FIG. 2 is a front elevational view of the dispenser and actuator cap.

FIG. 3 is a top plan view of the dispenser and cap, showing the directional spout swung to one side, to an operative discharge position.

FIG. 4 is an elevational view of the pressurized container and actuator cap, with the pivotal nozzle removed to reveal details of construction.

FIG. 5 is an inside elevational view of the pivotal nozzle member, revealing the cooperable valve portion or surface thereof.

FIG. 6 is a side elevational view of the pivotal nozzle of FIG. 5.

FIG. 7 is a view partly in side elevation and partly in axial section, of the actuator cap revealing interior details.

FIG. 8 is a side elevational view of a dispenser and directional applicator, this being similar to the view of FIG. 1 but showing another embodiment of the invention.

FIG. 9 is an elevational view of the actuator cap of FIG. 8 with the nozzle member removed, and

FIG. 10 is an inside elevational view of the nozzle member, revealing the valving arrangement.

Referring first to FIGS. 1–6, there is illustrated a pressurized container **10** of the type having an upstanding depressible hollow valve stem (not shown) through which the discharge of the aerosol substance takes place. Mounted on the valve stem of the container **10** is an actuator cap **12** of generally cylindrical configuration, having a vertical bore **14** arranged to communicate with the bore of the valve stem to receive the aerosol substance therefrom.

The actuator cap **12**, in being carried by the valve stem, may be shifted downward to a depressed position wherein the depressing of the valve stem will effect a discharge of the aerosol substance, the latter passing upward through the passage **14** of the cap. As seen clearly in FIG. 4, the cap **12** has a horizontal cylindrical bore **16** adapted to frictionally receive a short cylindrical leg portion **18** of an L-shaped nozzle member **20**, said member having a long leg portion **22** from which the discharge of the aerosol substance takes place. When the short leg portion **18** of the nozzle **20** is in its operative position in the bore **16** of the cap **12**, the nozzle may be swung through a complete circular arc as permitted by the cylindrical bearing surfaces. The nozzle **20** has discharge passages **24** and **26** communicating with each other, the passage **26** being in the short leg portion **18** as shown.

In accordance with the invention, cooperable valve elements are provided on the cap **12** and short leg portion **18** of the nozzle **20**, whereby communication is prevented between the discharge passages **24, 26** of the nozzle and the discharge passage **14** of the cap **12** when the nozzle is in the downward folded position illustrated in FIGS. 1 and 2. In effecting such valving, the cap **12** is provided with a horizontal discharge passage **28** which is eccentrically disposed with respect to the bearing bore **16**. Also, the horizontal discharge passage **26** of the nozzle **20** is eccentrically disposed with respect to the bore **16** and external cylindrical bearing surface of the short leg portion **18**.

The arrangement is such that the passages **26** and **28** are out of registration for the nozzle position shown in FIGS. 1 and 2, but become registered as the nozzle is

swung upward to either of the two horizontal positions indicated in FIG. 3 or when it occupies any higher position than the said horizontal positions.

In conjunction with the eccentric discharge passages **26**, **28** there are engageable surfaces **30**, **32** respectively of the cap **12** and short leg portion **18**, such surfaces being located at the adjoining ends of the passages **26**, **28**. When the surfaces **30**, **32** are kept in engagement with each other, an effective valve action is had as above explained, wherein the passages of the nozzle **20** are held out of communication with the passage **28** of the cap **12** when the nozzle is in the downward-folded or swung position.

For the purpose of maintaining such engagement, the bore **16** of the cap is provided with an annular groove **34**, and the extremity of the short leg portion **18** of the nozzle has a cooperable annular bead **36** adapted to be received in the groove **34**.

The cap **12** and nozzle **20** are preferably molded of a resilient plastic substance, and the resiliency of the substance enables the short leg portion **18** to be forced into the horizontal bore **16** until the annular bead **36** occupies the annular groove **34**. During such assemblage of the parts a slight distortion will occur, and the magnitude of the bead **36** is made relatively slight, to enable a satisfactory assemblage of the parts to be effected.

To facilitate the molding of the parts, the short leg portion **18** of the nozzle may be provided with a dummy or blind hole **38**.

The detent means **34**, **36** not only maintains the effectiveness of the valve arrangement but also retains the nozzle **20** in its captive position at all times, regardless of the pivoting movement when the device is placed in use.

It will be appreciated that in spite of the provision of the valve means and detent arrangement the parts still retain an advantageous simplicity, whereby they may be economically produced in simple mold cavities, and this is an important feature of the invention. The provision of the cylindrical bearing surfaces in conjunction with the detent bead **36** and groove **34** also enhance the seal at the joints between the nozzle **20** and cap **12**, preventing leakage at this point.

Another embodiment of the invention is illustrated in FIGS. 8–10, wherein the short leg portion of the nozzle is made of larger diameter, receiving a hub of the cap as distinguished from the construction of FIGS. 1–7, wherein the short leg portion of the nozzle is received in a bore of the cap.

In FIGS. 8 and 9, the cap **12***a* has a hub **40** which extends horizontally in a deep right-angled side notch **42**.

The nozzle member **20***a* has a short leg portion **18***a* of enlarged diameter, provided with a cylindrical internal bearing surface **44**. The short leg portion **18***a* slidably receives the hub **40** of the cap **12***a* so as to constitute a bearing about which the long leg may be swung in the manner illustrated in FIG. 3. The hub **40** has a discharge passage **46** and also a dummy or blind hole **48** to facilitate the molding procedure. The discharge passage **46** is eccentrically disposed with respect to the internal surface **44** and exterior cylindrical surface of the hub **40**, and the nozzle **20***a* has in its short leg portion **18***a* an eccentrically disposed discharge passage **50**. When the passages **46** and **50** are in alignment or communication with each other, as when the nozzle **20***a* is swung away from the storage position shown in FIGS. 8, a discharge of the aerosol substance may be effected by depressing the cap **12***a* in the usual manner. The hub **40** has a detent bead **52** which is received in a cooperable annular groove of the short leg portion **18***a*, to maintain engagement between the valving surfaces at the adjoining ends of the discharge passages **46**, **50** as with the embodiment of FIGS. 1–7. The embodiment of FIGS. 8–10 has the advantages explained above in connection with the first-described embodiment of the invention.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

I claim:

1. A dispensing device constituting a directional actuator for use with small hand-held dispensers of the type having a container provided with an upstanding hollow depressible valve stem through which the substance to be dispensed passes, said actuator comprising in combination:

(a) a cap having means engageable with said valve stem to mount the cap thereon whereby depressing movement of the cap depresses the stem,

(b) said cap having a hollow portion providing a discharge passage and having on said portion a cylindrical bearing surface disposed so that its axis extends at a right angle to the axis of the valve stem, said bearing surface encircling the discharge passage,

(c) an L-shaped spout having short and long hollow leg portions and discharge passages therein, communicating with each other,

(d) said short leg portion of the spout telescopically fitting the hollow portion of the cap and having a cylindrical bearing surface sealingly engaging the cylindrical bearing surface of the cap whereby the spout is mounted on the cap for pivotal movement of the long leg portion in a circular path which is spaced from and parallel to the axis of the valve stem, thereby to enable the long leg portion to be disposed either alongside the container or else in positions extending away from the container, and

(e) cooperable valve means on the cap and short leg portion of the spout, shutting off communication between said discharge passages of the cap and the spout when the long leg portion is substantially alongside the said container and connecting said passages for substantially all other positions of the long leg portion,

(f) said valve means comprising flat abutting surfaces of the hollow cap portion and end of the short leg, extending around the discharge passages thereof and disposed in a plane which is transverse to the axes of said discharge passages of the cap and short leg portion, and parallel to the said circular path of travel of the long leg portion, and further so that they are spaced from and parallel to the axis of the valve stem when the cap is carried by the latter.

2. A dispensing device as in claim **1**, wherein:

(a) cooperable rotary detent means are provided on the cap and short leg portion, holding said flat abutting surfaces in abutting relation.

3. A dispensing device as in claim **2**, wherein:

(a) said detent means comprises an annular groove in the cap and a cooperable annular bead received in the groove and carried by the short leg portion.

4. A dispensing device as in claim **2**, wherein:

(a) said detent means comprises an annular groove in the short leg portion and a cooperable annular bead received in the groove and carried by the cap.

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