

[54] **APPLICATOR FOR ATTACHMENT TO A SPRAY MIST DISPENSER**

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[21] Appl. No.: **426,478**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 286,916, Sept. 7, 1972, abandoned.

[52] U.S. Cl. **222/402.12**

[51] Int. Cl.² **B65D 83/14**

[58] Field of Search 222/156, 183, 182, 402.13, 222/402.14, 402.12, 179.5, 522, 524, 528, 545, 402.11; 128/208; 220/30.5, 38

[56] **References Cited**

UNITED STATES PATENTS

277,140	5/1883	Lane	220/38
2,153,245	4/1939	Gansz	222/545
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FOREIGN PATENTS OR APPLICATIONS

1,131,644	10/1968	United Kingdom	222/402.12
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Primary Examiner—Allen N. Knowles

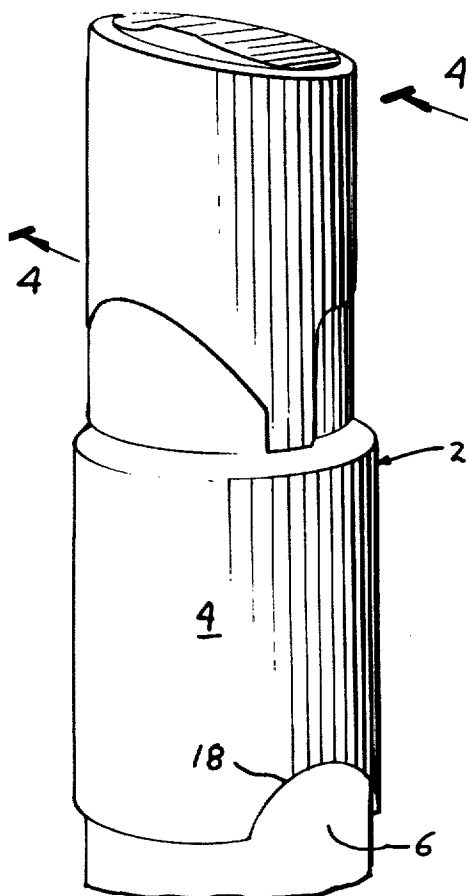
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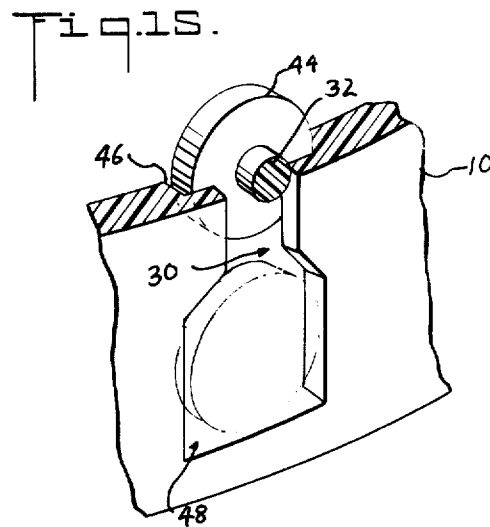
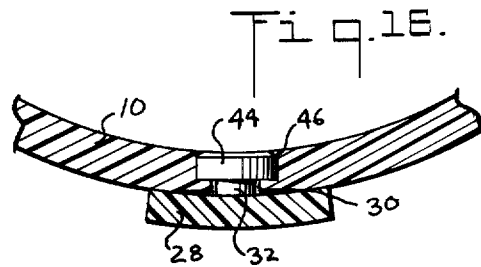
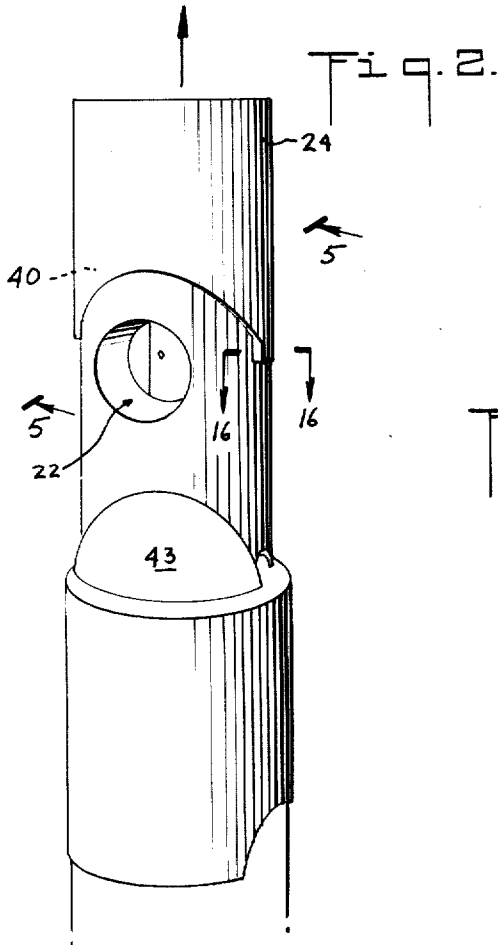
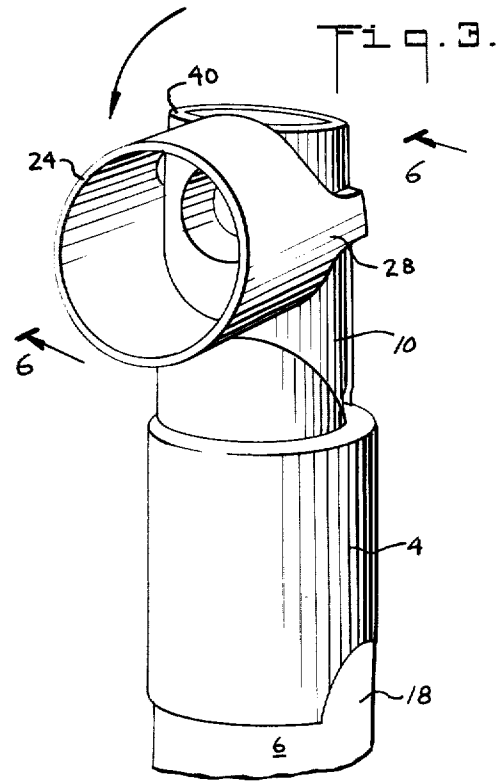
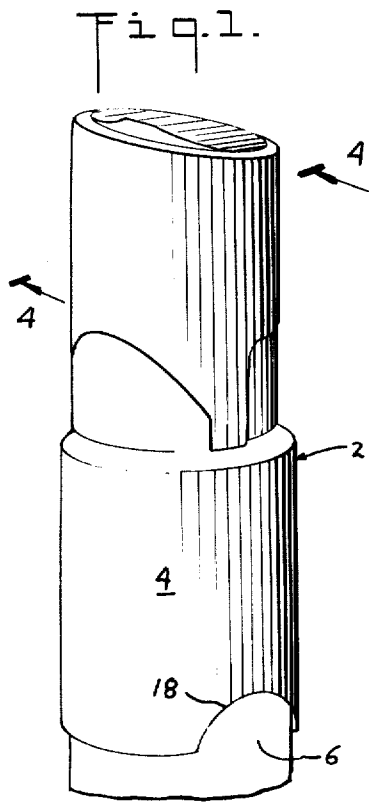
Attorney, Agent, or Firm—Kenyon & Kenyon Reilly Carr & Chapin

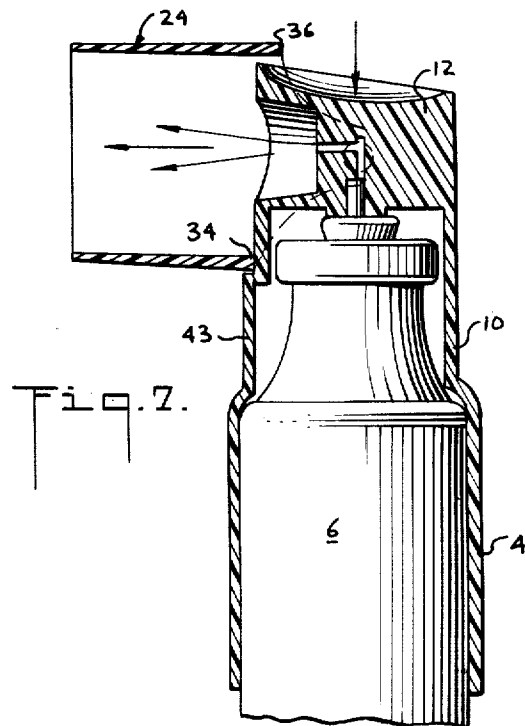
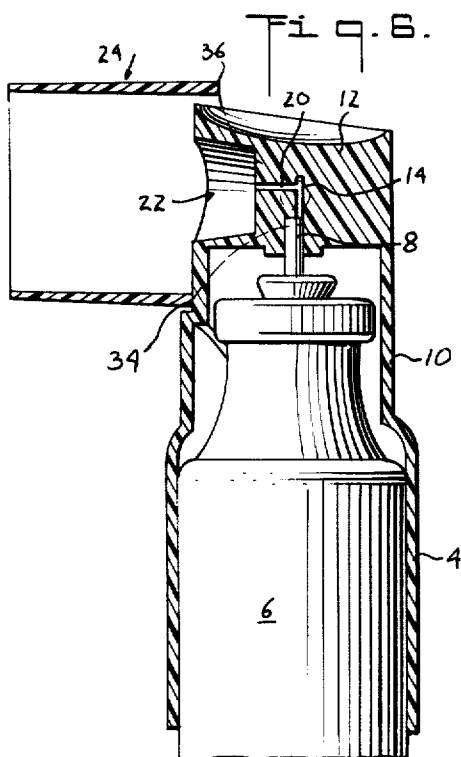
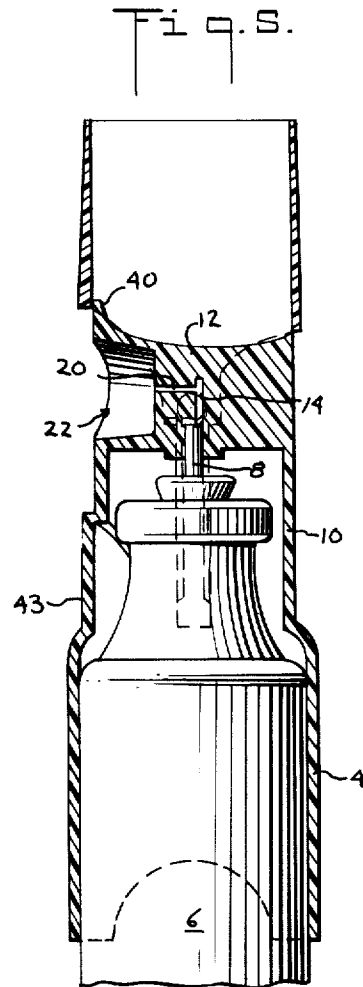
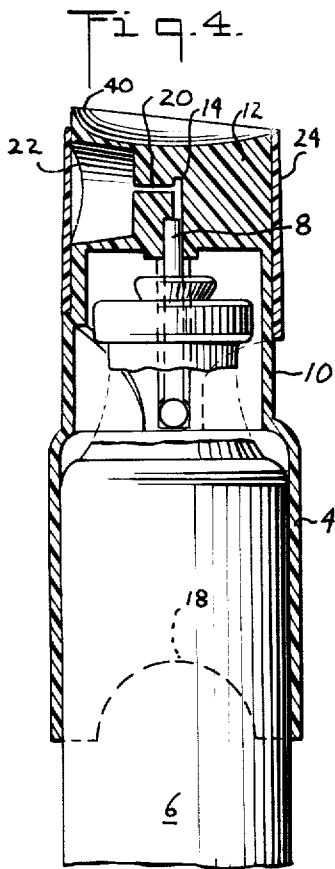
[57] **ABSTRACT**

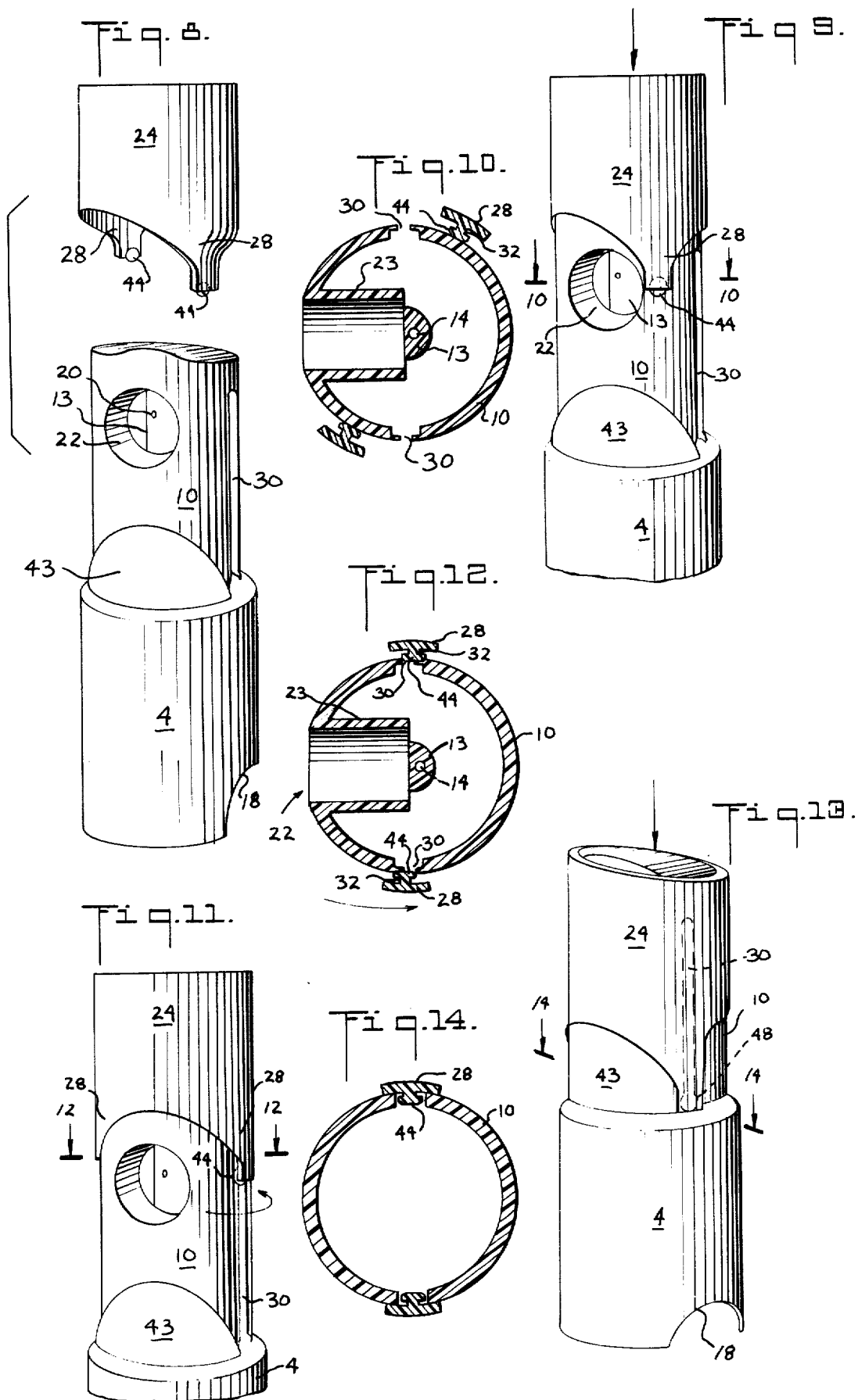
An applicator for attachment to a container for aerosol spray under pressure wherein the container is of the type having a dispensing valve provided with a projecting stem which releases a jet of spray upon depression relative to the container. The applicator includes a housing adapted to partially enclose the container and provided with a tubular sidewall surrounding the stem. A spray assembly within the sidewall grips the stem and directs the spray released thereby through a radial port in the sidewall. A sleeve is telescopically mounted on the sidewall for axial motion between a retracted position overlying the radial port and an extended position positioned beyond the sidewall. The sleeve is connected to the sidewall by two ears depending from the sleeve, which are provided at their free ends with two bosses which pass through two aligned axial slots in the sidewall. In the extended position, the bosses enable pivoting motion of the sleeve into concentric alignment with the radial port. Each boss is provided with an enlarged head positioned internally of the sidewall to prevent motion of the boss out of the slot. In the preferred embodiment, the shaping of the ears which depend from the sleeve is such that pivoting of the sleeve when in the extended position is possible only in a direction which will cause concentric alignment with the radial port and furthermore so that when aligned, the sleeve will point slightly upward to aid in dispensing the spray mist.

4 Claims, 18 Drawing Figures









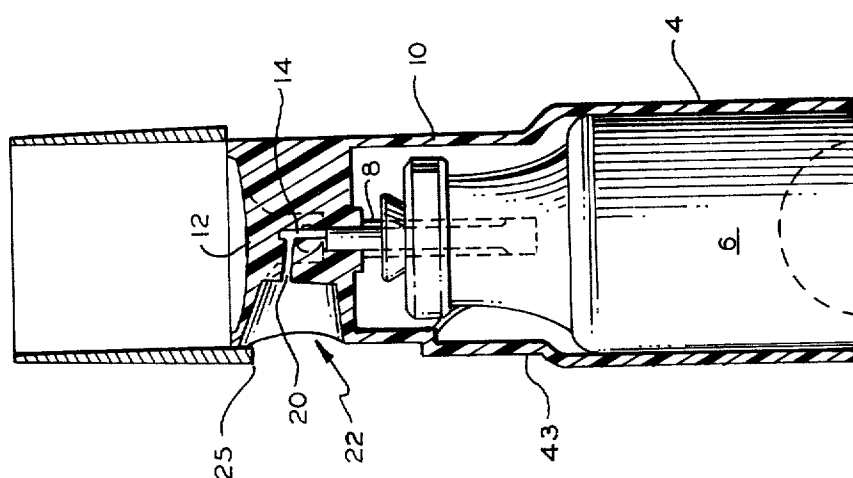


FIG. 17

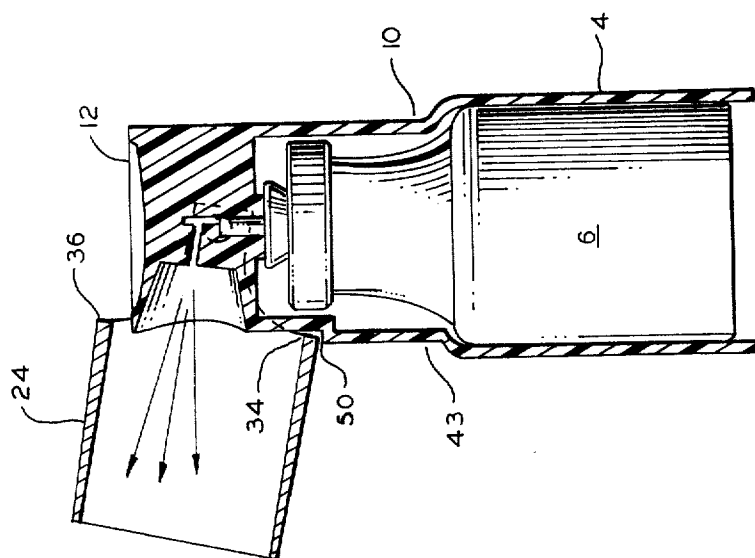


FIG. 18

APPLICATOR FOR ATTACHMENT TO A SPRAY MIST DISPENSER

RELATED APPLICATIONS

This application is a continuation-in-part of application Ser. No. 286,916 filed Sept. 7, 1972, and now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to applicators for attachment to aerosol spray containers, of the type utilized by a sufferer from bronchial ailments to direct a medicated spray into his mouth. In particular, the invention relates to an improvement on an applicator of the type disclosed in applicant's earlier U.S. Pat. No. 3,184,115 issued May 18, 1965.

The applicator disclosed in applicant's aforementioned U.S. Pat. No. 3,184,115 includes a housing adapted to enclose an aerosol spray container. In one embodiment that housing includes an upper tubular sidewall on which is mounted a sliding sleeve. Mounted within the sidewall is a spray assembly having an axial passage adapted to frictionally grip a projecting stem on the upper end of the container through which a jet of spray is released upon selective, relative movement of the stem into the container. Passages in the spray assembly direct the jet of spray in a radial direction through a nozzle. The sleeve is connected to the sidewall by two plain projecting bosses which ride in two depressed axial slots in the sidewall and which act as axles when the sleeve is moved to an upper extended position for pivoting motion of the sleeve into concentric alignment with the nozzle to assist in guiding the flow of spray into the user's mouth. To prevent ingress of dust and other foreign matter into the nozzle area when the sleeve is in the retracted position, a removable cap is provided in the upper end of the sleeve.

Although such prior device has proved satisfactory for its intended purposes, certain problems could be encountered from time to time. For example, the use of a plain boss riding in a slot to secure the sleeve to the sidewall could permit the sleeve to become disconnected in its extended position due to the boss moving laterally out of the slot. Disconnection, which is facilitated by the natural resilience of the plastics customarily used, might occur when the applicator became worn and when the sleeve is subjected to careless handling in its movement from one position to another relative to the sidewall. Another problem could occur if the user forgot to replace the cap on the sleeve after it had been returned to its retracted position, thus, permitting entry of foreign material to the nozzle area in which event the foreign materials would be blown into the user's mouth upon the next use of the device.

It would therefore be desirable to provide an applicator of the type generally described in which the possibility that the sleeve could accidentally become detached from the remainder of the applicator is minimized. It would also be desirable if the hygienic nature of the applicator could be enhanced by obviating the necessity for a replaceable cap which can become lost. In addition, it is desirable that such an applicator should be designed so that the sleeve when extended can only be pivoted in a direction which would cause it to become aligned with the axial passage in the spray assembly. Such should be obtained through a simple

process which does not require complicated shapes in the dispenser.

SUMMARY OF THE INVENTION

The present invention provides an applicator for attachment to an aerosol spray container, which obviates or minimizes problems of the type previously described.

More particularly, the invention comprises an applicator for attachment to a container for aerosol spray under pressure, wherein the container is of the type having a dispensing valve provided with a projecting stem which releases a jet of spray upon limited axial motion of the stem in a direction relatively inward of the container. The applicator includes a housing adapted to at least partially enclose the container and is provided with a tubular sidewall has an axial outer end spaced remotely from the container and a radial port extending through the sidewall. A spray assembly mounted within the sidewall is adapted to grip the stem of the dispensing valve and direct the jet of spray released thereby through the radial port. The sidewall includes two aligned, axially extending, closed slots positioned at opposite extremities of a diameter of the sidewall, which diameter is disposed perpendicularly to the axis of the radial port. A sleeve is telescopically mounted on the sidewall for axial sliding motion between a retracted position overlying the radial port and an extended position in which the sleeve is positioned beyond the outer end of the sidewall. Two ears extend from an axially inner end of the sleeve in partially overlapping relation to the slots. Each ear is provided with a boss which is slidably received in an adjacent one of the slots. The bosses abut against the closed outer ends of the slots in the extended position of the sleeve and they function as axles for pivoting motion of the sleeve into generally concentric alignment with the radial port. Each boss is provided with an enlarged head positioned on an opposite side of the sidewall from the associated ear, and the head overlaps the adjacent edges of the slot to prevent motion of the boss out of the slot.

The formation of the ears which depend from the remainder of the sleeve is done so that rotation only in one direction is possible when the sleeve is extended. This is accomplished by a cut-out such that the sleeve extends downwardly on the side of the radial port to the extent that it prevents backward motion of the sleeve when in the extended position. The rear side contains a cut-out sufficient to allow the sleeve to pivot to a position where the sleeve is aligned with the radial port. Furthermore, this design results in a slight angular elevation of the axis of the sleeve when positioned in alignment with the axial port to ease the use of the dispenser. (In each case throughout the specification, the dispenser is shown and described in an upright position. It should be noted that in many cases dispensers of this nature are inverted during use. Thus, the elevated or upwardly pointing sleeve, when in use may be in fact, depressed or downwardly pointing.)

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of an applicator for attachment to an aerosol spray, constructed in accordance with the preferred embodiment of the invention;

FIG. 2 is a perspective view of the applicator shown in FIG. 1 with a sleeve forming a part of the invention being moved from a retracted to an extended position;

FIG. 3 is a perspective view of the applicator shown in FIG. 2 with the sleeve rotated through 90 degrees to a position for use in directing aerosol spray into a user's mouth;

FIG. 4 is a cross-sectional, side view of the applicator shown in FIG. 2 taken along the lines 5—5 therein.

FIG. 5 is a cross-sectional, side view of the applicator shown in FIG. 2 taken along the lines 5—5 therein.

FIG. 6 is a cross-sectional, side view of the applicator shown in FIG. 3 taken along the lines 6—6 therein.

FIG. 7 is a cross-sectional, side view of the applicator shown in FIG. 6 but with the applicator depressed relative to the container to release a jet of spray.

FIG. 8 is an exploded perspective view of the applicator shown in FIG. 1 in an initial stage prior to assembly of the sleeve to the applicator.

FIG. 9 is a perspective view of the applicator shown in FIG. 8 in an initial step of assembly of the sleeve to the applicator;

FIG. 10 is a cross-sectional plan view of the applicator shown in FIG. 9 taken along the lines 10—10 therein.

FIG. 11 is a perspective view of the applicator shown in FIG. 9 in a further step of assembling the sleeve to the applicator.

FIG. 12 is a cross-sectional plan view of the applicator shown in FIG. 11 taken along the lines 12—12 therein;

FIG. 13 is a perspective view of the applicator shown in FIG. 11 in a final step of assembly of the sleeve to the applicator;

FIG. 14 is a cross-sectional plan view of the applicator shown in FIG. 13 taken along the lines 14—14 therein;

FIG. 15 is a perspective view, partially in cross section, of an enlarged scale showing portions of structure for connecting the sleeve to the applicator; and

FIG. 16 is a cross-sectional end view of a portion of the structure for connecting the sleeve to the applicator shown in FIG. 16.

FIG. 17 is a view identical to that of FIG. 5 but for the preferred applicator embodiment having a horizontal top.

FIG. 18 is a view of the embodiment of FIG. 17 with the sleeve aligned and the applicator depressed and spraying on an angle.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 of the drawings, an applicator for a container of aerosol spray under pressure, constructed in accordance with a preferred embodiment of the invention, is there shown.

The applicator includes a generally tubular body 2 comprising a lower, skirt portion 4 shaped to loosely enclose a cylindrical, container 6 of aerosol spray under pressure. The container 6 is of a conventional type including an internal dispensing valve (not shown) having a resiliently mounted upwardly projecting stem 8 (FIG. 4) which, upon being depressed a limited distance inwardly into the container 6, releases a measured amount of spray upwardly. Typically, the aerosol spray would be a medication for sufferers from bronchial and asthmatic complaints although the invention can also be employed with sprays for other purposes.

Extending above the skirt portion 4 and connected thereto by an intervening shoulder is an upper, concentric, sidewall 10 surrounding and extending upwardly

above the stem 8 of the container. Integral with the sidewall at its upper end there is a spray assembly which includes a solid end wall 12 having a central, depending portion 13 is provided with a central axial passage 14 having an enlarged lower portion which forms a frictional fit with the upper end of the stem 8 of the container.

The housing 2 is assembled onto the container 6 by slipping it over the container and then pressing it downwardly so that the passage 14 is forced on to and grips the upper end of the stem 8. Thereafter to release spray (FIGS. 6 and 7), the user presses on the upper end of the housing 2 and on the base of the container 6 in the region of two finger openings 18 cut in the skirt 4 at its lower end, thus causing relative closing motion between the stem 8 and the container so that a jet of spray is released upwardly. At its upper end, which is closed, the axial passage 14 communicates with a radial nozzle 20 through which the jet of spray is directed radially outwardly. The nozzle 20 is aligned with an enlarged sidewall 10 and is defined by an inwardly extending, horizontal tubular wall 23 (FIGS. 10 and 12) secured at its inner end to the depending portion 13.

When the applicator is not in use, the radial port 22 is closed off by a sleeve 24 slidably mounted on the sidewall 10 having its upper, or axially outer, end on a level with the upper end of the sidewall 10 when the sleeve is in the lower, or retracted, position shown in FIG. 4. The peripheral edge of the end wall 12, which is flush with the surface of the sidewall 10, forms a close sliding fit with the bore of the sleeve 24 so that the sleeve and the end wall 12 prevent passage of dust and other foreign matter into the radial port 22 when the sleeve is in its retracted position, thereby obviating the need for a replacement cap on the sleeve 24.

Integral with the sleeve 24 extending downwardly from its lower end on opposite sides of the sidewall 10 are two, coextensive ears 28 (FIG. 8) in partially overlapping relation to two vertical, aligned, closed slots 30 extending through the sidewall 10. The slots 30 are aligned at opposite ends of a diameter of the sidewall, which is disposed perpendicularly to the axis of the previously mentioned radial port 22. Each of the ears 28 (FIGS. 15 and 16) at its lower extremity is provided with a radially projecting boss 32 which passes inwardly through the adjacent one of the slots 30 for vertical sliding motion.

The sleeve 24 may be slid upwardly (FIG. 2) to an extended position in which the bosses 32 abut the closed upper ends of the slot 30. At this point the bosses function as axles permitting rotation of the sleeve into a position generally of concentric radial alignment with the radial port 22 (FIGS. 7 and 18). It will be appreciated that this is achieved by positioning the upper ends of the slots 30 generally on a level with the axis of the radial port 22. It then functions to assist in guiding the spray into the user's mouth. Once the sleeve 24 has been moved to its extended position, there is a possibility of pivoting it either in the direction necessary to align radial port 22 or in the reverse direction in which it would be facing in an opposite direction from the radial port. If the latter should occur then the user placing the sleeve adjacent his mouth would receive no spray, while the jet is sprayed with the directed outwardly away from the user. The preferred construction for preventing rotation in the wrong direction is illustrated by FIGS. 17 and 18. As shown thereon, the sleeve 24 is shaped so that its portion 25 which is di-

rectly above the radial port 22 extends downwardly a sufficient distance to contact the end wall 12 to prevent rotation of the sleeve backward away from the radial port. Thus, rotation forward to the position shown in FIG. 18 is the only type of rotation or pivoting possible. As illustrated on FIG. 18, this shaping also results in a sleeve being rotated through a smaller angle to obtain an upwardly inclined mist path. Thus, by this simple shaping two ends are served: rotation only in a proper direction to align the sleeve with the radial port is insured while at the same time an upwardly inclined mist path is obtained. Furthermore, the construction of the dispenser is simplified in that the top of the dispenser can be made essentially flat.

A second manner of avoiding undesirable rotation is through the use of a verticle projecting lip 40 (FIGS. 2 and 5). This lip is formed so that it projects above the end wall 12 at the upper end of the side wall 10 on the side thereof adjacent the radial port 22. The lip 40 is configured to at least partially overlap the interior of the sleeve adjacent the leading edge 34 at its lower end so that the latter cannot pivot reversely over the lip 40 and pivoting of the sleeve into a position out of alignment with the radial port 22, is prevented.

A raised surface 43 is provided at the lower end of the sidewall 10 and has a curved upper edge configured to matingly engage the edge 34 of the sleeve when it is in its retracted position.

The previously mentioned ears 28 are formed by omitting or removing portions of the sleeve to form a curved leading edge 34 shown on FIGS. 2, 7, 17 and 18. The leading edge 34 abuts the side wall 10 on the lower side of the sleeve in its position aligned with the nozzle to limit further rotational movement of the sleeve beyond that position. In the embodiment of FIG. 7, this limitation occurs after a rotation of approximately 90°. In the embodiment illustrated by FIG. 16, a smaller amount of rotation is obtained. An opposite trailing edge 36 of the sleeve is shaped to permit it to clear the upper end of the side wall 10 without interference during pivoting motion after the sleeve has been raised to its extended position, in both the embodiments of FIG. 7 and of FIG. 17 and 18.

Although the second means of preventing rotation on the wrong direction works well, it requires a more complex shape of the structure in that the lip 40 must be formed therein and in addition does not offer the advantage of having an upwardly directed mist. Thus, the former method of shaping the cut out in the sleeve is preferred.

To prevent the bosses 32 from riding out of their associated slots 30, as could inadvertently occur in previous devices due to rough handling, wear and the resilience of the plastic material from which the applicator components are made, each boss is provided with an enlarged head 44 (FIGS. 15 and 16) which overlaps the interior of the sidewall 10 along the edges of the slot 30. In this way accidental separation of the sleeve when it is in its extended position from the remainder of the applicator, is prevented. Each slot 30 is provided with a countersunk enlarged region 46 on the interior side of the sidewall to receive the enlarged head 44 of each boss so that the head does not project into the interior volume of the sidewall.

To enable the sleeve 24 to be assembled on the sidewall 10, each of the slots 30 is provided with an enlarged opening 48 at its lower end. The opening 48 is of sufficient size to permit the head 44 on each boss to

pass through from outside the sidewall 10 to the interior.

The method by which the sleeve 24 is assembled to the housing, forming a part of the present invention, is shown in FIGS. 8 through 14. In an initial step the ears 28 at the lower end of the sleeve are forced over the housing and the resilient plastic material of which the sleeve is formed permits the ears to deflect outwardly so that the enlarged heads 44 on the two bosses ride on the exterior surfaces of the sidewall 10 (FIG. 10). The assembler then rotates the sleeve manually relative to the housing until at least one of the bosses catches on an edge of one of the slots 30 (FIGS. 11 and 12). The sleeve is then slid manually down while the enlarged heads 44 are still catching on the edges of, but riding outside, the slots 30 until the enlarged portions 48 at the lower ends of the slots 30 are reached. At that point the natural resilience of the material causes the heads 44 to snap through the openings 48 (FIGS. 13 and 14) so that on the next subsequent elevation of the sleeve it will be positively secured to the housing against accidental detachment in the extended position.

Alternatively, the ears 28 may be forced over the housing so that at least one of the bosses catches on an edge of one of the slots 30. Thereupon, the movement of that boss over the surface 10 is stopped, but the other continues until it too is coupled. The sleeve is then slid manually down as in the assembly method first described.

Through this arrangement it is insured that when the sleeve is being moved from the retracted position and pivoted into the operating position there is no danger of it becoming detached. Still, assembly is facilitated by placing the openings 48 at the inner ends of the axial slots. In that position coaction between the sleeve and the sidewall prevents the sleeve from becoming dislodged and thus, the protection afforded at other sleeve positions is not needed. This combination of the boss with the enlarged head and an enlarged opening at the bottom of the slot insures ease of assembly while still avoiding any danger of the sleeve becoming dislodged.

FIG. 18 also illustrates the manner in which skirt 4 can be made to terminate at the bottom of container 6 when in an unoperated position. This prevents accidental discharge when the container is set down, i.e., container 6 must be pushed inside skirt 4 to obtain a discharge. Also shown on that figure is the manner in which the top 50 of surface 43 acts as a stop to prevent the sleeve 24 from sliding down in slots 30 when in an operating position.

What is claimed is:

1. An applicator for attachment to a container for dispensing spray mist, the container being of the type having a dispensing valve provided with a projecting stem which releases a jet of spray upon limited axial motion of the stem in a direction relatively inward of the container, the applicator comprising,
 - a housing adapted to at least partially enclose the container, said housing further including,
 - a tubular sidewall adapted to surround the stem of the dispensing valve, said sidewall having an axial outer end spaced remotely from the container and an axial inner end,
 - a radial port extending through said sidewall,
 - means mounted within said sidewall adapted to grip the stem of the dispensing valve and to direct the jet of spray released thereby through said radial port.

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two aligned, axially extending, closed slots through said sidewall at opposite extremities of a diameter thereof which is disposed perpendicularly to the axis of said radial port, each having an enlarged opening at its inner axial end,

a sleeve telescopically mounted on said sidewall for axial sliding motion between a retracted position overlying said radial port, and an extended position in which at least a major portion of said sleeve is positioned beyond the outer end of said sidewall, with cooperable abutting portions of said sleeve and said sidewall at a position directly above said radial port when said sleeve is in an extended position thereby insuring that pivoting of the sleeve is only possible in a direction which will align it with said radial port, and the end of said sleeve, when said sleeve is in said retracted position, terminating such that it does not extend above the top of said tubular side wall thereby preventing dust or dirt collection on the inside of said sleeve,

two ears extending from an axially inner end of said sleeve in partially overlapping relation to said slots, two bosses projecting from said ears slidably received in said slots, said bosses abutting against the closed outer ends of said slots in the extended position of said sleeve and enabling pivoting motion

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thereof into generally concentric alignment with said radial port, each said boss having, an enlarged head, of a size permitting said enlarged head to freely pass through the enlarged opening in said slots, positioned internally of said sidewall, said head overlapping the adjacent edges of said slot to prevent motion of said boss out of said slot except when in a fully retracted position, and

a raised surface at the lower end of said sidewall below said radial port, said surface acting as a stop to prevent said sleeve from sliding in said slots when pivoted to a dispensing position.

2. An applicator as defined in claim 1 wherein said cooperable abutting portions comprise,

a projecting portion connected with said sidewall, said portion being directly above said radial port.

3. The improvement in claim 1 wherein the outer end of said sidewall is essentially flat and wherein said cooperable abutting portions comprise a downwardly extending portion of said sleeve abutting said sidewall directly above said radial port.

4. The improvement of claim 1 in which the end of said sleeve, when said sleeve is in said closed position, is coterminous with said top, so as to form with it a smooth surface that catches no dirt or dust.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,927,806

DATED : December 23, 1975

INVENTOR(S) : Philip Meshberg

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 17 between "sidewall" and "has" the following should be inserted: -- adapted to surround the stem of the dispensing valve. The sidewall --.

Column 4, line 24 change "is", second occurrence, to -- in --.

Signed and Sealed this
twentieth Day of April 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks