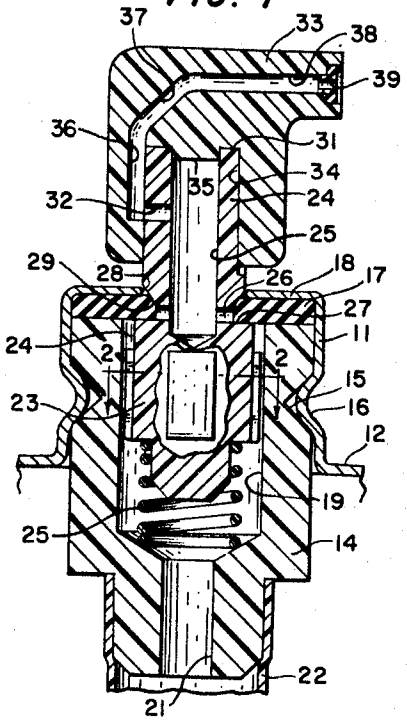
May 27, 1969 E. B. GASSER ET AL 3,446,402

AEROSOL DISPENSER WITH LATERAL DISCHARGE AND HEATING HOLDER THEREFOR

Original Filed Aug. 26, 1965

FIG. 1



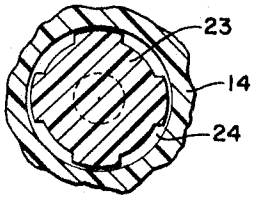


FIG. 2

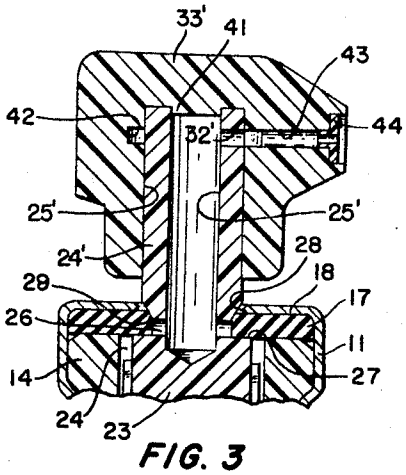


FIG. 3

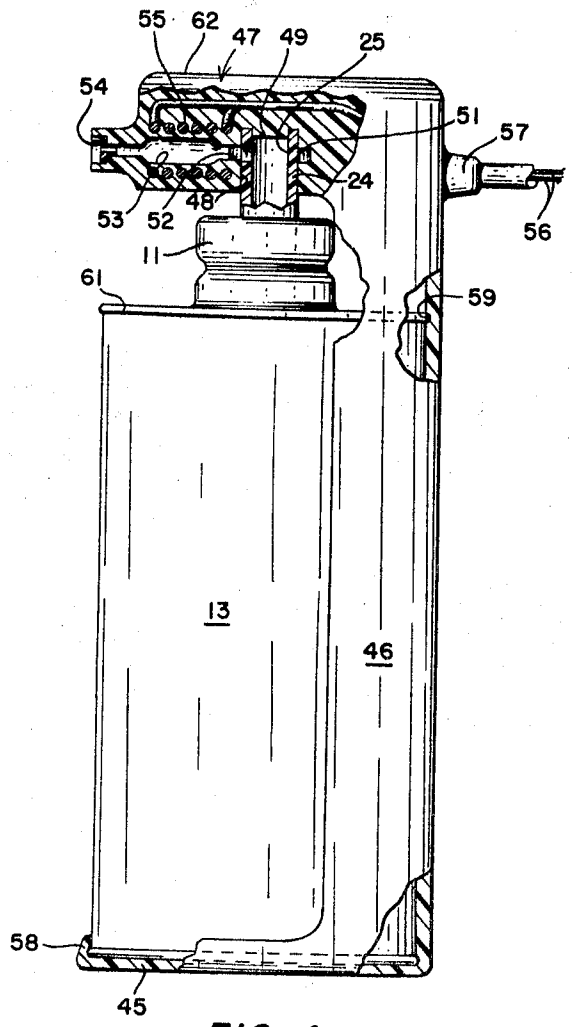


FIG. 4

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AEROSOL DISPENSER WITH LATERAL DISCHARGE AND HEATING HOLDER THEREFOR

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Continuation of application Ser. No. 482,844, Aug. 26, 1965. This application July 24, 1967, Ser. No. 655,664
Int. Cl. B67d 5/62
U.S. Cl. 222—146 13 Claims

ABSTRACT OF THE DISCLOSURE

A holder for a pressurized dispensing container including a warming chamber for the dispensed product and means to cooperatively receive the depressible valve stem in substantially all rotative positions of the container.

This application is a continuation of my copending application Ser. No. 482,844, filed Aug. 26, 1965, now abandoned.

This invention relates to dispensers of the aerosol type and is particularly concerned with such of the type having a depressible hollow plunger provided with a lateral discharge arrangement for directional control.

Many different types of aerosol dispensers have been proposed and invariably the widest used conventional type employs a depressible hollow plunger that discharges axially at its outer end through a head structure containing directional passages. There has been considerable development of special head structures for directional control of the discharged material. The present invention provides a relatively simple inexpensive construction which solves the problem and provides definite directional control of the discharged material, together with novel assembly thereof into a warming head holder.

With the foregoing in mind it is a major object of the present invention to provide a novel aerosol type container structure of the type having a depressible hollow valve stem wherein a lateral discharge port is provided in the valve stem for directional control of the discharged material.

Another object of the invention is to provide a novel aerosol container discharge control wherein the depressible hollow valve stem has a lateral outlet port associated with a directional operating head passage.

A further object of the invention is the novel assembly of the foregoing aerosol container with a special holder and warming head device, particularly detailed structure of the former.

Further objects of the invention will appear in connection with the appended claims and the annexed drawings wherein:

FIGURE 1 is a fragmentary section showing an embodiment of the invention;

FIGURE 2 is a section substantially on line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary section showing another embodiment of the invention; and

FIGURE 4 is a side elevation partially broken away and in section showing a further embodiment of the invention.

FIGURES 1 and 2 show the upper end of a more or less conventional aerosol type container embodying the invention.

The upper end of the container for a material under pressure comprises the upstanding valve enclosing boss 11 integral with the top wall 12 of a fluid tight container 13 of the type shown in FIGURE 4.

A valve housing 14 is formed with an external groove 15 that coacts within inwardly impressed crimp 16 in the boss 11 that retains the valve body against longitudinal displacement in the container.

At the upper end of the valve body a sealing annulus 17 of rubber or like resilient material is longitudinally contained between valve body 14 and the top wall 18 of boss 11.

Valve body 14 is formed centrally with an upper enlarged bore 19 and a lower reduced bore 21 opening into the contents of the container through a flexible dip tube 22 suspended from the valve body.

A plunger 23 is slidably mounted within bore 21. As shown in FIGURE 2 the sides of plunger 23 are recessed to provide longitudinal passages 24. A coiled compression spring 25 is bottomed in bore 19 and urges plunger 23 upwardly. The upper end of plunger 23 is of reduced cross-section to form a hollow stem 24 having an internal bore 25 open at the outer end and closed at its lower end. One or more lateral ports 26 are formed in the lower end of stem 24 just above the flat annular face 27 of the plunger which engages resilient annulus 17.

Just above lateral port 26 where the stem 24 extends through aperture 28 in wall 18 stem 24 is formed with a downwardly and inwardly tapered smooth annular surface 29 that is snugly engaged by the internal periphery of annulus 17. As shown in FIGURE 1, the inner periphery of annulus 17 normally closes all passages 24 and the lateral port or ports 26 under the force of spring 25, so that the pressurized contents of the container cannot escape.

The foregoing structure is essentially conventional, being preferably that disclosed in U.S. Letters Patent No. 2,631,812 issued Mar. 17, 1953 to R. H. Abplanalp.

Above the level of boss 11, stem 24 terminates in an open end edge 31 and is formed below that edge with a lateral discharge port 32 leading out of bore 25.

An operating head 33 is mounted on the upper end of stem 24 and it is formed interiorly with a bore 34 that fits snugly upon stem 24 and has a button 35 piloted within and sealingly closing the upper end of bore 25. Internally head 33 is formed with a through passage consisting of a longitudinal section 36 opening at its lower end into port 32, an inclined section 37 and a laterally directed section 38 terminating in a spray nozzle 39. Preferably a spline or the like is provided between stem 24 and bore 34 to properly orient passage 36 with port 32.

When head 33 is depressed against the force of spring 25, the inner periphery of sealing annulus 17 is sufficiently deformed to provide a fluid transmitting connection between passages 24 and ports 26 whereby the pressurized contents of the container may discharge through bores 21 and 19, passages 24, ports 26, bore 25, port 32 and the passage in head 33. This arrangement provides a simple reliable directional control of the dispensed material.

In the embodiment of the invention shown in FIGURE 3 the parts are the same as in FIGURES 1 and 2 except for the plunger stem 24′ and head 33′. Stem 24′ is an integral hollow extension of plunger 23 and is formed with a bore 25′ intersected at right angles by a lateral discharge port 32′.

Head 33′ has a closed end longitudinal bore 25′ by which it fits snugly upon stem 24′ in spaced relation to can wall 18, with internal button 41 of the head being piloted into and sealing closed the open upper end of bore 25′.

Bore 25′ is formed with an annular wall recess 42 that communicates with the outer end of port 32′ regardless of the angular position of head 33′ on the stem, and with a lateral discharge port 43 having a spray nozzle 44.

Operation is essentially the same as in FIGURES 1 and 2. When head 33′ is depressed the contents of the

container may discharge past the inner periphery of sealing annulus **17** and through bore **25'**, port **32'**, recess **42** and port **43**, with effective directional control.

FIGURE 4 discloses the invention as incorporated in an assembly wherein a disposable container may be installed in a special warming head fixture, as for shaving cream dispensing where warming of the pressurized fluid being discharged contributes to its efficiency and comfort during use.

The container **13** shown in FIGURE 4 may be the same as that of FIGURE 3, for example, with the operating head of the latter removed.

Container **13** is mounted in a combination holder and actuator assembly comprising a base **45**, an upstanding part-cylindrical wall **46**, and an upper warming head **47** that extends over the top of the container. Preferably, as illustrated, the base **45**, wall **46** and head are an integrally molded plastic structure, formed of some flexible lightweight material such as polyethylene.

Head **47** is formed with a downwardly open bore **48** that snugly receives valve stem **24** and the bottom of bore **48** contains button **49** that pilots into and seals the upper open top of bore stem **25** when the container is in position.

Internally bore **48** is formed with an annular recess **51** at the level of valve discharge port **38**, and recess **51** communicates with a lateral discharge port **52** having an intermediate enlarged expansion chamber portion **53** and a spray nozzle **54**.

A suitable heating wire coil **55** surrounds the discharge port at portion **53**, the current carrying wires **56** for the coil also being imbedded and projecting from the rear of this holder at **57** for attachment to a plug or the like if the holder is to be portable.

Thus it will be seen that the container **13** may be merely inserted into the open front of the holder, base **45** flexing downwardly to permit the stem **35** to be thrust up into bore **48** and the lower end of the container to be swung into longitudinal alignment with the holder. An integral lower rim **58** is preferably provided around the open edge of the base to help retain the container in the holder, and it may be desirable to provide within the holder wall an arcuate recess **59** to interfit with the rounded upper body wall rim **61** of the container being inserted. This rim helps locate the container body in the holder, and since recess **51** is annular, port **38** will open into recess **51** in any position of rotation of the holder on base **45**.

The inherent resilience of the plastic holder is such that the parts reassume the condition of FIGURE 4 when the container **13** is inserted.

For operation, with the wires **56** connected, the operator merely presses down at top surface **62** of the head **47**, whereby, due to the flexibility of the wall section **46** upwardly of recess **59**, the head **47** moves down and depresses stem **24** to discharge the contents of the container through the head port **52**.

In passing through port **52**, the gas-liquid mixture expands and slows up somewhat within chamber **53** thereby affording added time for improved warming from coil **55**.

When the contents of container **13** have been dispensed it can easily be removed and a fresh disposable container installed in the holder in a matter of seconds. These refills can be sold with a removable plastic cap covering the open end of bore **25** and port **32**.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therfore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. In a container for dispensing fluid under pressure, a valve mechanism in the upper part of said container having a depressible hollow stem having its lower end within the container in direct operative connection with said valve mechanism and formed with a longitudinal bore through which said fluid passes when the stem is depressed to open the valve, the upper end of said stem projecting out of said container, an operating head having a recess snugly fitting upon said outer end of the stem, means at the bottom of said head recess extending completely over and closing the outer end of said stem bore, means providing a lateral fluid discharge port through the wall of said stem, and means forming a passage through said head open at its inner end to said discharge port and having its outer end in the side of said head, said head recess being a closed outer end bore snugly receiving said valve stem, and said bore being formed with a circumferentially extending internal groove of appreciable extent intersecting the inner end of said passage and registering with said lateral port in a number of different rotative positions of said stem relative to the head.

2. A mounting holder for a disposable container of the type having a depressible hollow valve actuating stem with a lateral discharge port in said stem for dispensing fluid under pressure, said holder comprising a lower base, an upper head overhanging the base and a normally stiff side wall extending between the base and head having a portion capable of flexing, said side wall being mainly laterally open between said base and head, means forming a downwardly facing closed bottom bore in said head adapted to receive said stem and close the upper end of said hollow stem when a container is inserted through the open side wall to seat on said base and a fluid discharge passage through said head registerable at its inner end with said port, said holder side wall flexing in response to pressure on said head to depress said stem and discharge the container through said stem, port and passage.

3. The mounting holder defined in claim **2** including means in said head for heating fluid in said head passage.

4. The mounting holder defined in claim **3**, wherein said heating means is a coil imbedded in the head in surrounding relation to said passage and having connections for a source of electrical energy.

5. The mounting holder defined in claim **3**, wherein said passage is formed with an enlarged expansion portion that is surrounded by said heating means.

6. In the mounting holder defined in claim **2**, means defining a circumferential groove in said head bore intersecting the inner end of said head passage and located to register with said stem port in substantially all rotative positions of said container in the holder.

7. A combination holder and warming head assembly for operatively mounting a disposable dispensing container of the type having a depressible hollow actuating stem provided with an outlet discharging fluid under pressure comprising a head structure in said assembly providing a fluid warming chamber having means for heating the interior thereof, there being an inlet to said chamber and an outlet therefrom, retainer means in said assembly for removably mounting and retaining said container thereon with the stem outlet in fluid communication with the chamber inlet, and means comprising a flexible portion of said assembly adapted to abut the end of the stem of the retained container and operating when flexed to depress said stem and effect discharge of fluid from the container through said warming chamber.

8. A combination holder and warming head assembly for operatively mounting a disposable dispensing container of the type having a depressible hollow valve ac-

tuating stem structure provided with an outlet for discharging fluid under pressure from the container comprising a container support portion and a flexibly connected warming head portion formed with a warming chamber having an inlet and an outlet, and means for retaining said container on the support portion with said stem structure operably engaging said head portion and said stem structure outlet in communication with said chamber inlet, so that flexing of said warming head portion depresses said stem structure to discharge fluid from the container through said chamber and the chamber outlet.

9. The combination holder and warming head structure defined in claim **8**, wherein said container support portion comprises a base for seating the bottom of the container and the warming head portion overhangs said base and said portions are connected by a flexible side wall of the assembly so that when the container is seated on said base said stem structure abuts the underside of said warming head portion and may be actuated by pressing said head toward said base.

10. For use in a holder that comprises a container supporting base, a member upstanding from said base, a head structure mounted on said member to extend in overhanging relation to said base, said head structure having a bore opening downwardly toward the base and having a side passage that intersects said bore at its inner end and terminates outwardly in a discharge aperture, and actuating means on the head structure adapted to operably depress the valve stem of an aerosol-type container adapted to extend into said bore; a disposable aerosol-type dispensing container having a bottom adapted to seat on said base and having a depressible hollow valve actuating stem projecting upwardly therefrom adapted to release fluid under pressure from the container into said stem when the stem is depressed toward the container, and a lateral fluid discharge port in said stem, said port being so located that, when said container is seated on said base with said stem projecting into said head structure bore, said lateral port is in fluid communication with the inner end of said passage in the head structure and remains in such communication with said passage when said actuating means is operated to depress the valve stem of the seated container.

11. For use in a holder that comprises a container supporting base, a member upstanding from said base, a head structure mounted on said member to extend in overhanging relation to said base, said head structure having a substantially cylindrical bore opening downwardly toward said base and having a side passage intersecting said bore in downwardly spaced relation to said recess bottom and terminating outwardly in a discharge aperture, and actuating means on the head structure adapted to operably depress the valve stem of an aerosol type container adapted to extend into said bore; a disposable aerosol-type dispensing container having a depressible hollow cylindrical valve actuating stem projecting upwardly therefrom adapted to release fluid under pressure from the container into said stem when the stem is depressed toward the container, and a lateral discharge port in said stem, said stem being of such size as to be adapted to fit snugly within said bore and said port being so located that, when said container is seated on the base with the stem projecting into said bore, said port is in fluid communication with the inner end of said passage in the head structure and remains in such communication when actuating means is operated to depress the valve stem of the seated container.

12. For use in a holder that comprises a container supporting base, a member upstanding from that base, a head structure mounted on said member to extend in overhanging relation to said base, said structure having a closed bottom bore opening downwardly toward said base and having a side passage that intersects the bore intermediate the bottom and the open end thereof and terminates outwardly in a discharge aperture, and actuating means on the head structure adapted to operably depress the valve stem of an aerosol-type container adapted to extend into said bore; a disposable aerosol-type dispensing container having a depressible hollow valve stem projecting upwardly therefrom adapted to release fluid under pressure from the container into the stem when the stem is depressed toward said container and a lateral discharge port in the stem, said stem being of such size as to be adapted to snugly fit within said bore and said port being so located that, when the container is in said holder seated on said base with the stem bottomed within said bore, said port is in fluid communication with the inner end of said passage and remains in such communication when said actuating means is operated to depress the valve stem of said seated container.

13. For use in a combination holder and warming head assembly having a container seating base and a warming head structure flexibly mounted to overhang said base, said head structure having a downwardly open bore and having a side passage containing a warming chamber that is provided with an inlet intersection said bore and a discharge outlet; a disposable aerosol-type dispensing container having a bottom adapted to seat on said base and a depressible hollow valve stem extending upwardly therefrom adapted to release fluid under pressure into said stem when the stem is depressed toward the container, and a lateral discharge port in said stem, said stem being of such size as to be adapted to fit snugly within said bore and to have end abutment within said bore when the container is seated on said base, and said port being so located that when the container is seated on the base the port is in fluid communication with the inlet to the warming chamber, whereby when the head structure is flexed relative to said base the stem of a seated container in said assembly is depressed to discharge fluid under pressure through said warming chamber passage.

References Cited

UNITED STATES PATENTS

2,624,623	1/1953	Saacke.
2,662,668	12/1953	Schmidt.
2,686,652	8/1954	Carlson et al.
2,806,739	9/1957	Drell.
3,146,916	9/1964	Kronbeim.
3,186,645	6/1965	Eberlin.
3,229,858	1/1966	Lesh.

FOREIGN PATENTS

191,767	9/1964	Sweden.

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U.S. Cl. X.R.

222—180, 402.24