March 14, 1967 R. P. McGHIE 3,308,857

PRESSURIZED DISPENSING CONTAINERS

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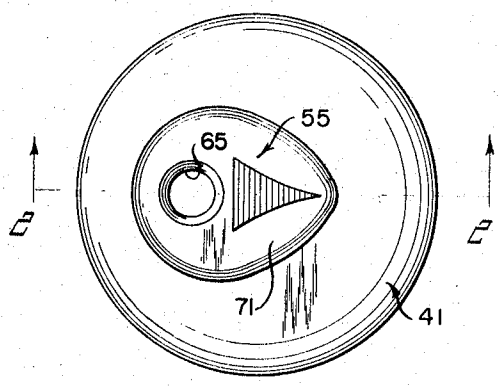

FIG. 3

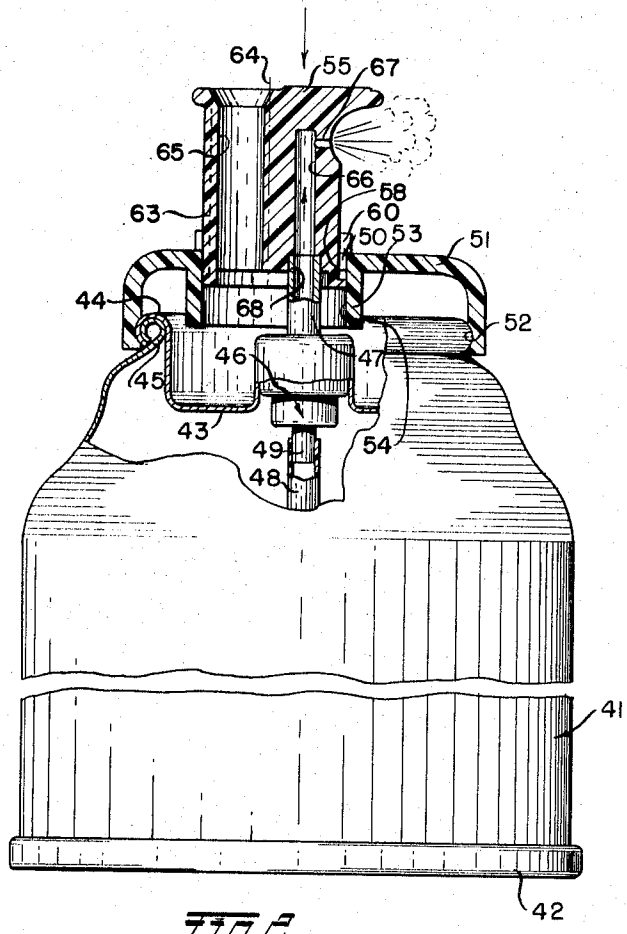

FIG. 2

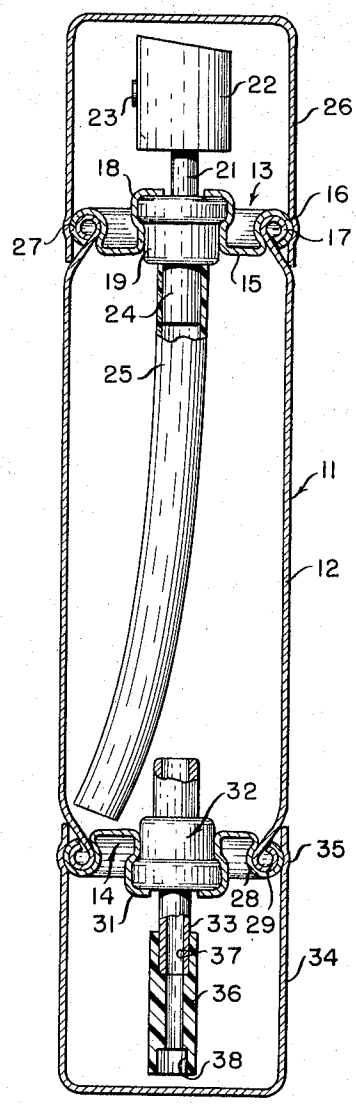

FIG. 1

INVENTOR
Russell Park McGhie

BY Strauch, Nolan & Neale

ATTORNEY

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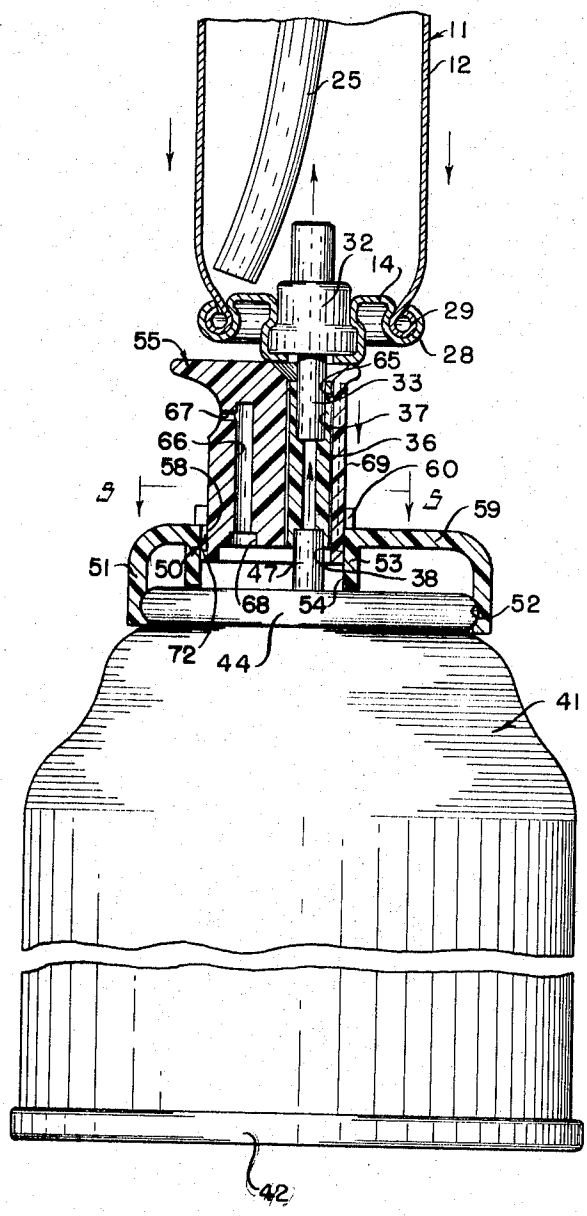
Fig. 4



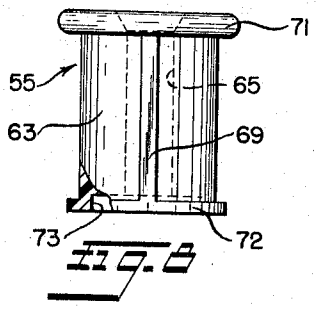


Fig. 8

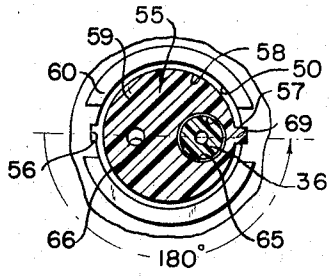


Fig. 5

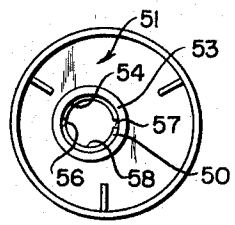


Fig. 6

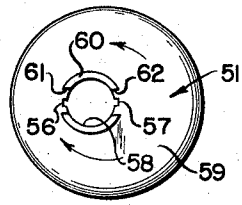


Fig. 7

INVENTOR

Russell Park McGhie

BY Strauch, Nolan & Neale

ATTORNEYS

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PRESSURIZED DISPENSING CONTAINERS

Russell Park McGhie, New York, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y., a corporation of Delaware

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11 Claims. (Cl. 141—20)

This invention relates to pressurized dispensing containers, such as the usual aerosol type, and is particularly concerned with special filling and refilling arrangements and structures.

The usual aerosol container is thrown away when the internal gas pressure reduced to atmospheric, with attendant waste of the remaining product. It has been proposed to refill some of these containers, but so far only relatively complex and bulky arrangements which usually necessitate removal of the spray control button from the valve stem and otherwise risk accidental discharge of the contents have been suggested.

The present invention eliminates the foregoing objections by providing an entirely novel container structure which enables it to be refilled after merely removing a bottom closure member. The invention also includes novel cap structure for the supply container adapting it for connection to the container to be refilled and for independent dispensing operation.

It is, therefore, the major object of this invention to provide a novel waste-proof arrangement for filling and refilling pressurized dispensing containers.

A further object of the invention is to provide a dispensing container having a novel bottom structure for speedy safe refilling.

Another object of the invention is to provide a novel supply container cover structure for optional coupling to a container to be refilled, or for independent direct dispensing.

A further object of the invention is to provide a novel cover structure for a pressurized supply container having a rotatable control button movable between a direct dispensing position and a position for refilling another container.

Another object of the invention is to provide a novel pressurized container having similar normally closed valve assemblies at opposite ends.

A further object of the invention is to provide a novel pressurized container assembly having a slidable rotatable dispensing control button formed with longitudinal dispensing bores eccentric to its axis of rotation.

Further objects of the invention will appear as the description proceeds in connection with the annexed drawings wherein:

FIGURE 1 is a side elevation mainly in section and partly broken away showing a refillable dispensing container according to a preferred embodiment of the invention;

FIGURE 2 is an enlarged elevation partially broken away and sectioned showing the larger supply container with its outlet control head in position for dispensing of the contents directly into the atmosphere;

FIGURE 3 is a top plan view of the supply container of FIGURE 2;

FIGURE 4 is a composite elevation partially broken away and partly in section showing the supply container outlet control head in position for refill coupling to the smaller dispensing container, and showing the dispensing container as connected during the filling operation;

FIGURE 5 is a section on line 5—5 of FIGURE 4 showing the outlet control head structure and the coupling tube;

FIGURE 6 is a bottom plan view of the snap-on cap for the supply container;

FIGURE 7 is a top plan view of the cap of FIGURE 6; and

FIGURE 8 is a side elevation of the control head on the supply container cap.

Referring to FIGURE 1 the dispensing container **11** comprises a tubular body **12** that has substantially identical upper and lower end structures **13** and **14** respectively.

Upper end structure comprises a sheet metal cap **15** having its external periphery formed with a bead **16** clenched tightly over the upper beaded end **17** of body **12**.

Cap **15** is formed with a central dome **18** wherein is clenched a discharge valve assembly **19** of known construction per se having a projecting hollow operating and discharge stem **21** that is axially reciprocable in the assembly, being spring biased outwardly. A spray directing button **22** is detachably secured upon stem **21** and is formed with an internal passage communicating with the open end of stem **21** and terminating in a side outlet **23**.

Valve assembly **19** may advantageously be of any suitable construction wherein a hollow stem such as that at **21** is displaced into the assembly to unseat a normally closed valve element (not shown) and allow the pressurized contents of body **12** to discharge through stem **21**. Valve assembly **19** has an inlet conduit portion **24** on which is mounted a dip tube **25** having its open lower end near the bottom of the container body. The actual structure of valve assembly **19** and the associated spray directing button may be that disclosed in U.S. Letters Patent to Abplanalp No. 2,631,814 issued March 15, 1953 to which reference may be had for further detail.

The upper end of the dispensing container is enclosed by a removable snap-on cover **26** the side walls of which is internally grooved at **27** to provide a friction interfit with the container body at bead **16**.

Similarly lower cap **14** is formed with a peripheral bead **28** clenched over lower body bead **29** and an outwardly extending central dome **31** wherein is secured a valve assembly **32** preferably identical with that at **19** and including a normally closed valve having an outwardly spring biased reciprocable hollow operating stem **33**.

The lower end of the dispensing container is closed by a cover **34** that is preferably identical with that at **26** and is formed with a side wall bead at **35** for frictional interfit with lower container bead **28**.

A short rigid length of adapter conduit **36** is formed with a counterbore **37** by which it is press fitted upon valve stem **33** so as to be mounted on that stem. At its lower end conduit **36** is formed with a counterbore **38**, for a purpose to appear.

Covers **26** and **34** are preferably identical and their cylindrical side walls are of the same diameter as that of cylindrical body **12**, so that the entire dispenser assembly comprising upper cover **26** enclosing and protecting the upper valve stem and button **22** and lower cover **34** enclosing and protecting the lower valve stem and conduit **36** appears as a substantially continuously cylindrical package.

To use the dispenser of FIGURE 1, upper cover **26** is pulled off and button **22** is depressed. Container **11** is of the usual aerosol type, and the walls of the container body may be sheet metal or some suitable plastic, or even glass.

Referring now to FIGURES 2 and 3, the supply container **41** is a cylindrical can having a suitably closed bottom **42** and a reduced upper end closed by a cap **43** having a peripheral bead **44** clenched over a body bead **45**. Cap **43** is domed to fixedly mount a discharge valve assembly **46** which is preferably the same as valve assemblies **19** and **32** and comprises a reciprocable hollow oper-

ating and discharge stem 47 that is normally spring biased outwardly. A dip tube 48 is connected to intake conduit 49 of the valve assembly.

Container 41 is of the usual aerosol type wherein displacement of stem 47 release the pressurized contents through stem 47.

In this supply assembly, the valve stem 47 is surrounded by a snap-on plastic cap 51 having an internal groove 52 for frictional interlock with body bead 44. Cap 51 is integrally formed with an internally projecting hollow boss 53 having a cylindrical bore 54 axially displaceably mounting a discharge control head or button 55 of special construction. Bore 54 is eccentric with respect to the axis of valve stem 47.

At the upper end of bore 54 is formed an integral inwardly projecting ledge 50, shown best in FIGURE 6, and formed in ledge 50 are diametrically opposite recesses 56 and 57 for a purpose to later appear. The inner periphery 58 of ledge 50 is a cylinder interrupted by recesses 56 and 57.

Looking now at FIGURE 7 the flat transverse end wall 59 of the cap has upstanding therefrom a short integral collar 60 that is interrupted by diametrically opposite recesses 61 and 62 symmetrical with recesses 56 and 57 respectively. The cylindrical inner surface of collar 60 is a continuation of the cylindrical inner periphery of ledge 50.

Control head 55 comprises a cylindrical body 63 slidably guided in cylindrical surface 58, the axis of rotation of body 63 being indicated at 64. Eccentrically on opposite sides of axis 64, the head 55 is formed with a longitudinal through bore 65 and a longitudinal smaller diameter bore 66 that has its inner end open inwardly of cap 51 and its outer end closed except for a reduced lateral discharge passage 67. The axes of bores 65 and 66 are parallel and lie on the same diameter of head 55 on opposite sides of axis 64. The inner end of bore 66 is counterbored at 68 to fit slidably upon the upper end of valve stem 47 when the head 55 is in the FIGURE 2 position, so that when head 55 is depressed it shifts valve stem 47 to open the valve assembly at 46 and permit discharge of the pressurized contents of the container 41 through stem 47, bore 66 and passage 67 directly into the atmosphere. Head 55, FIGURE 3, is shaped to direct discharge of container 41.

With reference to FIGURES 2, 5 and 8 head 55 is formed with a longitudinally extending narrow integral rounded surface rib 69 that extends between the enlarged tip 71 of the head to an annular radially outwardly extending flange 72. Rib 69 is located in 180° displaced position from discharge aperture 67, and when rib 69 is disposed in recess 57 as shown in FIGURE 5 the direction of discharge is automatically indicated to the operator looking down on head 55.

The lower end of head 55 is internally recessed at 73, and bores 65 and 66 both terminate within this recess.

When the parts are in FIGURE 2 position, with valve stem 47 in counterbore 68 and the head 55 urged upwardly by the spring bias (not shown) acting on stem 47 at least sufficiently to clear opening 67 above collar 60, direct discharge from the supply container may be obtained by manually depressing head 55 as indicated by the arrow in FIGURE 2. At this time rib 69 is disposed in ledge recess 56.

The dispensing container of FIGURE 1 may be refilled when empty, by the operation illustrated in FIGURE 4. First head 55 is lifted high enough to disengage stem 47 from counterbore 68, and then head 55 is turned 180° to the FIGURE 4 position wherein rib 69 is disposed in recess 57 as shown in FIGURE 5.

Valve stem 47 is now projecting into the lower end of bore 65 which is now axially aligned therewith. Abutment of flange 72 with ledge 55 prevents head 55 from being pulled axially out of the cap 51. Rotation of head 55 is permitted due to the inherent resiliency of the plastic material of cap 51 which permits rib 69 to cam in and out of recesses 56 and 57. The operator can sense by touch when rib 69 drops into a recess, so that he knows when head 55 is properly oriented.

Now the bottom cover 34 is removed from dispensing container 11, and conduit 36 is thrust down through bore 65 of head 55 (FIGURE 4) until the counterbore 38 telescopes over valve stem 47. Now when dispensing container 11 is pushed axially toward supply container 41 both valve stems 33 and 47 are axially displaced sufficiently to open both valves 32 and 46, so that pressurized contents of container 41 may enter the dispensing container body 12. This relationship is maintained until the internal fluid pressure in both containers 11 and 41 becomes substantially equal, and the dispensing container 11 is withdrawn from the supply container. Both valves 32 and 46 automatically close at this time, and the dispensing container is now refilled and ready for use as before described. Usually, supply container 41 is charged with an inert gas that provides an internal pressure sufficiently greater than that normally used in the usual dispenser to refill several dispensers in this manner.

Preferably cap 51 and head 55 are integrally molded from polyethylene or another solid plastic material of similar characteristics.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respect 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. A pressurized dispensing container assembly having dispensing and refill valve assemblies mounted in its upper and lower end walls respectively, each of said valve assemblies comprising an axially displaceable outwardly projecting operating and discharge stem, a dip tube attached to the dispensing valve within the container, and a removable bottom cover on said container enclosing the projecting valve stem of the refill valve assembly.

2. In the assembly defined in claim 1, a manual operating button on the upper valve stem, and a refill conduit connection on the lower valve stem, said covers enclosing said conduit connection.

3. A pressurized dispensing container comprising an upper valve assembly having an upwardly projecting displaceable operating and discharge stem, a cover member adapted for mounting on said container, a head rotatably mounted on said cover member about a spaced axis parallel but eccentric with respect to the axis of said valve stem, said head having a first longitudinal through passage and a second longitudinal passage terminating in a lateral discharge outlet, the axes of said passages being equally spaced with respect to the axis of rotation of said head so that said head may be rotated between two operative positions where said first and second passages respectively are aligned with said stem.

4. The pressurized container defined in claim 3, wherein means is provided for releasably holding said head in said positions.

5. In a system for filling dispensing containers from a supply container, each said dispensing container having in its lower end a one-way valve operated by an axially displaceable projecting hollow operating and discharge stem, a supply container having a head structure formed with a through passage adapted for alignment with an upwardly projecting axially displaceable discharge and operating stem of a valve in the supply container, and an adapter conduit connection on said dispensing container stem whereby when said containers are axially brought together with said conduit connection projecting through

said head passage to engage said supply container valve stem both of said valves are opened to permit the pressurized contents of said supply container to enter said dispensing container.

6. In the system defined in claim 5, a cap on said supply container, said head being rotatably and axially slidably mounted on said cap upon an axis eccentric to the axis of the supply container valve stem and having a direct discharge passage therethrough whereby said head may be rotated about its said axis to align said direct discharge passage with said supply container valve stem so that depression of said head directly releases the contents of said supply container to the air.

7. Cover structure for a supply container adapted for refilling dispensing containers comprising a body having a bore and a head rotatable in said bore on the axis of said bore, means in said head defining a through passage eccentric to said axis for reception of a conduit connection to a dispensing container to be refilled, and means in said head defining a direct discharge passage spaced from said axis and equally eccentric with respect thereto providing for direct discharge from said supply container.

8. Cover structure for a supply container adapted for refilling dispensing containers comprising a body portoin having a bore, a head rotatably and axially slidably mounted within said bore, means providing longitudinal fluid passages in said head that are parallel to the axis of said bore and spaced equally eccentric with respect to the axis of rotation of said head, cooperating means on said cover and head for limiting axial displacement of said

head in said bore and for preventing axial separation of said cover and head, and cooperating means on said cover and head for holding said head in either of two angularly spaced operative positions.

9. In the cover structure defined in claim 8, said means for preventing axial separation of the head and cover comprising a radial flange on said head coacting with an internal ledge at said bore.

10. In the cover structure defined in claim 8, said means holding said head in angularly displaced positions comprising 180° apart recesses in said bore and a longitudinal rib on said head adapted to be slidably disposed in one or the other of said recesses.

11. In the cover structure defined in claim 10, said cover and head being molded polyethylene and said ribs coming in and out of said recesses as permitted by the inherent resiliency of said polyethylene.

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LAVERNE D. GEIGER, *Primary Ebxaminer.*

H. S. BELL, *Assistant Examiner.*