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2,752,066

COMBINED DISPENSER AND VALVE OPERATING MECHANISM

Filed Nov. 9, 1953

2 Sheets-Sheet 1

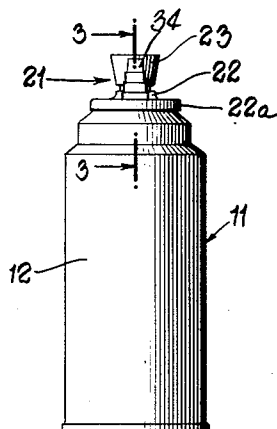


Fig. 1.

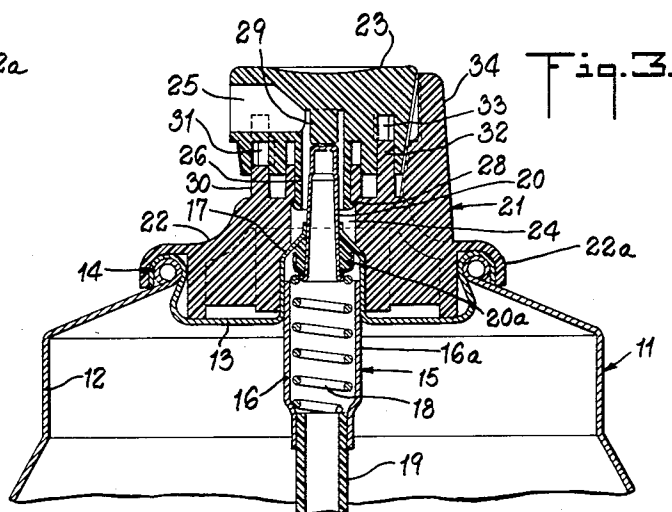


Fig. 3.

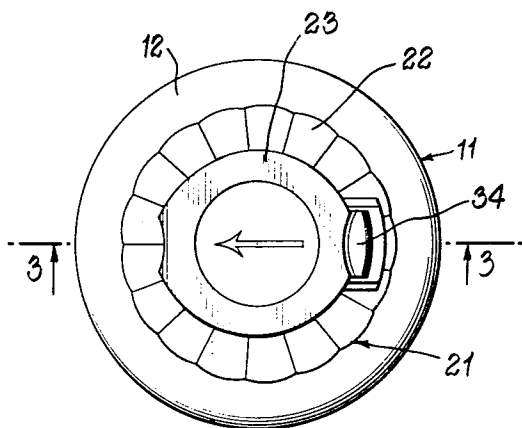


Fig. 2.

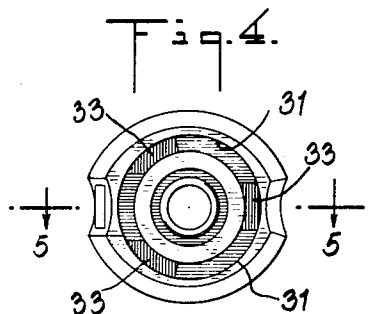


Fig. 4.

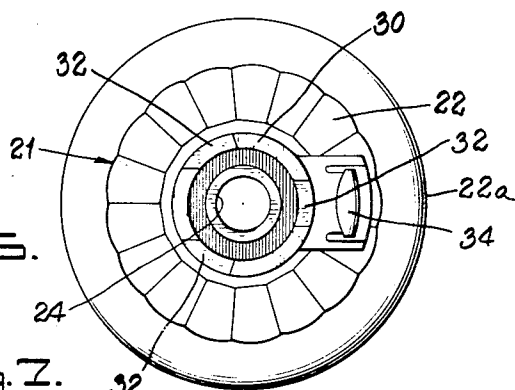


Fig. 6.

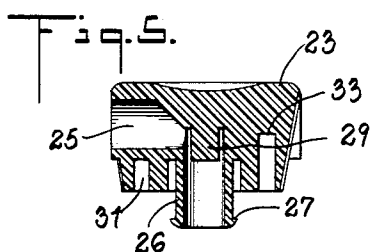


Fig. 5.

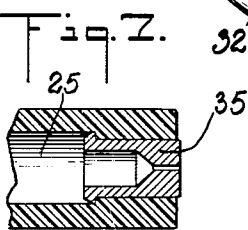


Fig. 7.

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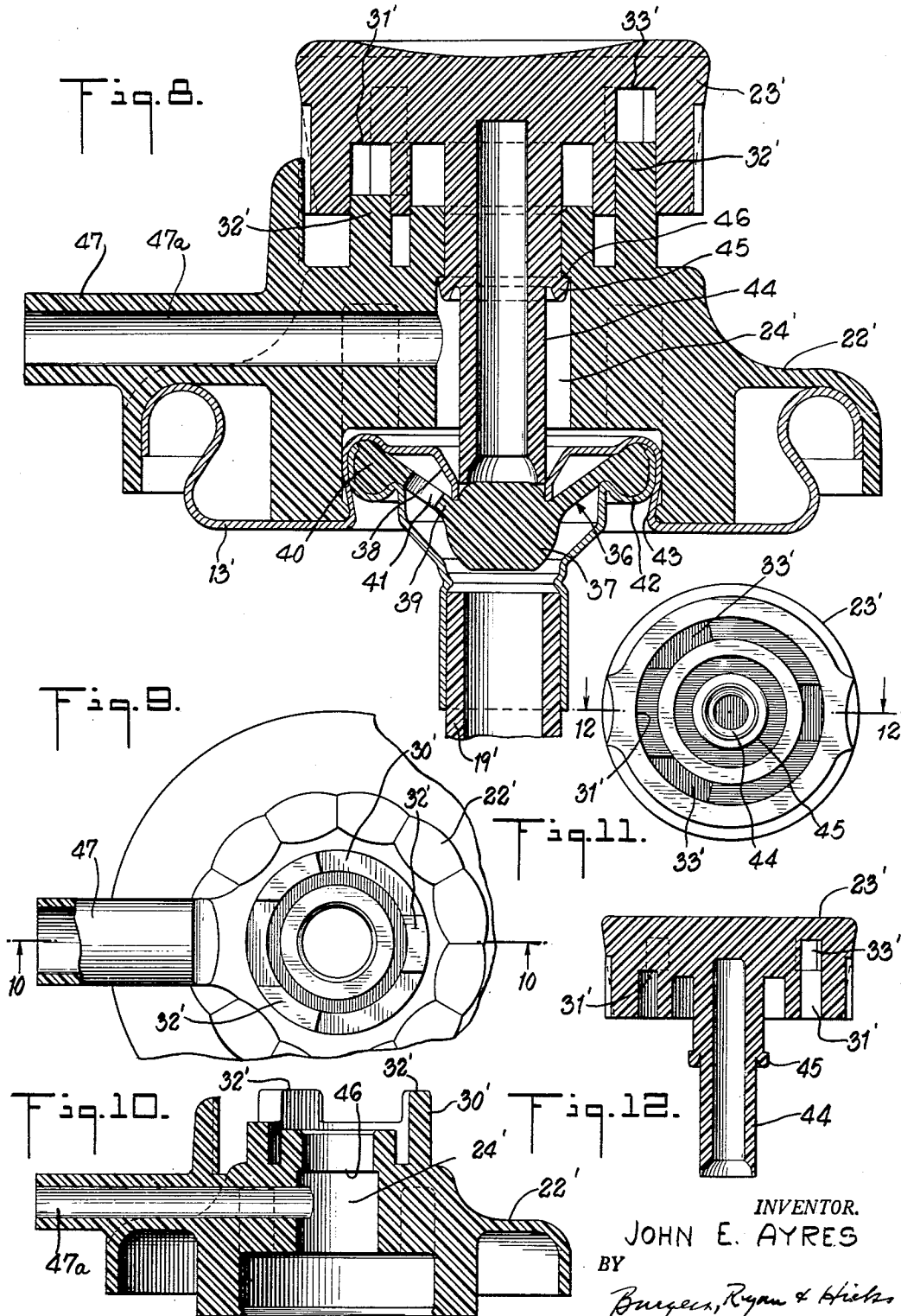
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COMBINED DISPENSER AND VALVE OPERATING MECHANISM

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2 Sheets-Sheet 2



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COMBINED DISPENSER AND VALVE OPERATING MECHANISM

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Application November 9, 1953, Serial No. 396,831

18 Claims. (Cl. 222—41)

The present invention relates to a combined dispenser and mechanism and relates, more particularly, to a combined dispenser and valve operating mechanism for a pressurized container.

An object of the present invention is to provide a combined dispenser and valve operating mechanism for controlling the operation of a valve in a pressurized container. A further object of the invention is to provide a combined dispenser and valve operating mechanism which may be rendered operative or inoperative by a simple adjustment. A still further object of the present invention is to provide a combined dispenser and valve operating mechanism which may be manufactured at a relatively low cost.

Other objects and advantages of the invention will be apparent and best understood from the following description and the accompanying drawings in which:

Fig. 1 is a side view of a pressurized container having a dispenser top embodying the present invention;

Fig. 2 is a top view of the container illustrated in Fig. 1;

Fig. 3 is a fragmentary view in section taken along the line 3—3 of Fig. 2;

Fig. 4 is a bottom view of an operating member for the dispenser top shown in Fig. 1;

Fig. 5 is a section view along the line 5—5 of Fig. 4;

Fig. 6 is a top view of the base of the dispenser top shown in Fig. 1;

Fig. 7 is a section view of a nozzle suitable for use in the dispenser top shown in Fig. 1;

Fig. 8 is a vertical section view of a modified form of dispenser top embodying the invention;

Fig. 9 is a top view of the base of the dispenser top illustrated in Fig. 8;

Fig. 10 is a section view taken along the line 10—10 of Fig. 9;

Fig. 11 is a bottom view of the dispenser cap illustrated in Fig. 6; and

Fig. 12 is a section view taken along the line 12—12 of Fig. 11.

Referring to the drawings in detail there is a pressurized container 11 of a type commonly used for packaging and dispensing a wide variety of commodities such as shaving soap, cosmetics, insecticides, paints and the like.

The container 11 consists of a can body 12 having the usual opening in the top thereof with a closure member 13 secured in the opening. The closure member is secured to the can body by crimping the outer edges of the closure member 13 over a bead which surrounds the opening in the top of the can body, as indicated at 14. The closure member 13 has an opening therein in which a valve mechanism, indicated generally at 15, is located. The operation of the valve 15 controls the discharge of the contents of the container and in addition, the container may be filled with gas under pressure through the valve mechanism 15.

The valve mechanism 15 illustrated in Fig. 3, consists of a tubular valve body 16, the top half of which is formed by the closure member 13 and the bottom half of which is formed by a retaining cup 16a secured to the closure member. The tubular valve body 16 has a centrally apertured valve seat 17 located at the top end thereof and has an opening at its lower end communicating with the interior of the container. The lower end of the valve

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body is constricted to form a seat for a valve spring 18 and to receive a siphon tube 19 which extends into the container. The valve spring 18 engages with the base of a tubular valve stem 20 and urges the valve stem upwardly in the valve body with the top of the valve stem projecting through the aperture in the valve seat. The action of the spring on the valve stem urges a washer 20a of compressible material carried by the valve stem into engagement with the valve seat. To open the valve, the valve stem is depressed against the force of the spring and the washer is moved out of engagement with the valve seat. Such a valve mechanism is described and claimed in United States Letters Patent Nos. 2,667,993 and 2,670,106, entitled "Pressurized Container Valves" and "Multi-Purpose Pressurized Container Valves," issued to me on February 2, 1954, and February 23, 1954, respectively, and reference may be made to said patents for a more detailed description thereof.

The closure member 13 has a depressed portion forming a recess or cavity in the top thereof and a combined dispenser and valve operating mechanism, indicated generally at 21, is seated in such recess or cavity. The entire dispenser and valve operating mechanism may be molded from a suitable plastic material such as polyethylene which is resilient and hence compensates for any slight inaccuracies in the sizes of the various parts while providing a snug fit.

The dispenser and valve operating mechanism 21 consists of two parts, a base 22 and an operating member or cap 23 which is rotatably mounted on the base 22. The base 22 has an opening 24 extending therethrough which fits over the top of the valve body and the valve stem extends through the opening when the base is installed on the closure member 13. Extending outwardly from the sides of the base there is a downwardly extending flange 22a which fits over the bead formed at the point where the closure member is secured to the body of the container and snugly engages therewith.

The cap 23 which is rotatably mounted on the top of the base 22, contains a discharge passageway 25 having an outlet in the side of the cap. The discharge passageway 25 communicates with a flexible sleeve 26 extending downwardly from the bottom of the cap. The sleeve, which may be formed as part of the cap, fits into the opening 24 in the base and communicates through the opening in the base with the valve-controlled opening in the container. The sleeve extends into the opening in the base and has an outwardly projecting lip 27 surrounding its lower end which engages with a shoulder 28 in the side-walls of the opening 24 to secure the cap to the base. The cap can be assembled in the base by forcing the sleeve into the opening in the base.

When the valve stem is depressed, the contents of the container are discharged through the opening in the base to the flexible sleeve 26 and thence, to the discharge passageway 25. In passing through the flexible sleeve, the pressure of the contents being discharged acts against the interior of the flexible sleeve and urges the sleeve into engagement with the sides of the opening in the base. This forms a seal between the cap and the base and prevents leakage of the contents between the base and the cap.

A valve operating member in the form of a downwardly extending lug 29, is carried by the cap. The lug 29 extends into the top of the sleeve 26 at a point above the valve stem 20 and engage with the top of the valve stem to operate the valve when the cap is depressed.

The cap and the base have interfitting members thereon in the form of an annular rib 30 on the top of the base which fits into a groove 31 in the bottom of the cap. The top surface of the rib 30 and the bottom surface of the groove 31 are in opposing relation and have matching cams formed thereon to control the downward move-

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ment of the cap relative to the base. The matching cams are in the form of spaced projections 32 which extend upwardly from the top of the rib and spaced recesses 33 in the bottom of the groove. When the cap is in operating position, the projections 32 are aligned with the recesses 33 and the cap may be depressed relative to the base a sufficient distance to operate the valve. The projections 32 and the recesses 33 are arranged so that when the cap is rotated away from its operating position, the projections 32 engage with the bottom of the groove and prevent the cap from being depressed. This prevents accidental discharge of the container by pressure exerted on the cap in any position except the operating position of the cap.

The valve spring acts on the cap through the valve stem and the valve operating member and valve stem normally holds the cap in its raised position relative to the base. Ordinarily, the cap will be rotated 180° from its operating position to what may be termed the closed or non-operating position.

An indicator 34 extending upwardly from the base provides an index to the position of the cap. The indicator 34 also extends over and closes the outlet of the discharge passageway 25 when the cap is in locked position and prevents foreign matter from entering the discharge passageway.

In the event that the contents of the container are to be discharged as a spray, a discharge nozzle 35 may be inserted in the outlet of the discharge passageway 25 illustrated in Fig. 7.

In the modified form of a dispenser and valve operating mechanism embodying the invention shown in Figs. 8 through 12, a different type of valve is used to close the opening in the container.

As shown in Fig. 8, opening in the closure member 13' is closed by a spider 36 of flexible material. The spider 36 has a solid center or hub 37 which is held in sealing engagement with the inturned flange or lip 38 surrounding the opening in the closure member for the container. The hub 37 is connected by arms 39 to an annular rim 40 with openings 41 being located between the arms through which the contents of the container may be discharged when the hub is forced out of engagement with the flange 38. The outer rim 40 of the spider is confined in a shell 42 which is forced into a necked portion 43 surrounding the opening in the closure member so as to hold the hub in engagement with the flange 38 under tension. The lower end of the shell communicates with the interior of the container and a siphon tube 19' may be attached thereto. A valve of this type is more fully described and claimed in my copending application S. N. 315,052 filed October 16, 1952, entitled "Valve Mechanism" and reference may be made thereto.

The dispenser and valve operating mechanism consists of a base 22' and a cap 23' rotatably mounted on the base.

A hollow stem 44 carried by the cap extends through an opening 24' in the base into engagement with the hub of the spider. The stem 44 has a lip 45 intermediate its ends which engages and forms a seal with a shoulder 46 on the sides of the opening on the base. A spout 47 extends from one side of the base and forms discharge passageway 47a in the base which communicates with the opening 24' therein. In this case when the contents of the container are discharged through the opening 24' in the base and through the spout and the pressure of the contents being discharged is transmitted to the inside of the hollow stem and forces the lip 45 into engagement with the shoulder 46 and forms an effective seal between the cap and the base at this point.

The base 22' has an annular rib 30' which fits into a groove 31' in the bottom of the cap 23'. The opposing surfaces of rib and groove have projections 32' and recesses 33', respectively, formed thereon for controlling the movement of the cap relative to the base in the manner previously described.

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Briefly, the operation of a combined dispenser and valve operating mechanism embodying the present invention is as follows. When the cap is in its inoperative position the index member extends over the discharge outlet in the cap and the matching cam surfaces on the cap and base are in engagement so as to prevent downward movement of the cap relative to the base. To operate the valve, the cap is rotated 180° to its operating position where the projections on the rib on the base can enter into the recesses in the bottom of the groove on the cap.

When the cap is in its operating position, it may then be pressed down against the force of the valve spring (or the spider) to open the valve. Upon opening of the valve, the contents of the container will be discharged by the pressure in the container through the opening in the base and the discharge passageway communicating therewith. The pressure of the contents being discharged acts on the tubular member extending downwardly from the cap and fitting into the opening in the base to form a seal between the cap and the base to prevent leakage of the contents between the cap and the base.

It will be understood that various changes and modifications may be made in the embodiments of the invention illustrated and described herein without departing from the scope of the following claims.

I claim:

1. A combined dispenser and valve operating mechanism for a pressurized container having a valve controlled opening through which the contents of the container are discharged which comprises a base mounted on a container, said base having an opening extending therethrough, said opening communicating with a valve in an opening in the container, a cap rotatably mounted on the base and being movable vertically with respect to the base, a sleeve of flexible material carried by the cap and extending into the opening in the base, said sleeve engaging with the base and forming a seal between the cap and the base, said cap having a discharge passageway therein communicating with the opening in the base through said sleeve, a valve operating member carried by the cap and extending through the opening in the base, interfitting members on opposing surfaces of the cap and the base, said interfitting members having interengaging portions on opposing surfaces thereof for controlling vertical movement of the cap relative to the base and an index member extending upwardly from the base at one side of the cap, said index member extending over the outlet of the discharge passageway in the cap in one position of the cap.

2. A combined dispenser and valve operating mechanism for a pressurized container as defined in claim 1 wherein the opening in base has a shoulder formed therein and the flexible sleeve on the cap has a projection formed thereon, said projection engaging with said shoulder and securing the cap to the base.

3. A combined dispenser and valve operating mechanism for a pressurized container as defined in claim 1 wherein the interfitting members on the cap and the base comprise an annular rib on the top of the base and a groove in the bottom of the cap.

4. A combined dispenser and valve operating mechanism for a pressurized container having a valve controlled opening through which the contents of the container are discharged which comprises a base mounted on a container, said base having an opening extending therethrough and communicating with a valve in an opening in the container, a cap rotatably mounted on the base and being movable vertically relative to the base, a valve operating member carried by the cap and through the opening in the base into engagement with the valve in the container, said valve operating member having a portion engaging with the opening in the base and forming a seal between the cap and the base and interengaging

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means on opposing surfaces of the cap and the base for controlling downward movement of the cap relative to the base.

5. A combined dispenser and valve operating member for a pressurized container as defined in claim 4 wherein the cap and the base have interfitting members on the opposing surfaces thereof with the interengaging means on the cap and the base being formed on opposing surfaces of said interfitting members.

6. In a combined dispenser and valve operating unit for a pressurized container having a valve controlled opening therein, the combination which includes a base having an opening therein, said opening being in communication with the valve controlled opening in the container and a discharge outlet in the dispensing unit, a cap rotatably mounted on the base and being movable vertically with respect thereto, a valve operating member carried by the cap and extending into the opening in the base, said cap having a recess in one surface thereof and an upwardly projecting member carried on an opposing surface of the base, said upwardly projecting member fitting into the recess at one position of the cap and permitting downward movement of the cap relative to the base at said one position.

7. In a combined dispenser and valve operating mechanism for a pressurized container, the combination which includes a base member adapted to be mounted in a fixed position on a container, said base member having an opening extending therethrough, a cap member rotatably mounted on top of the base member, said cap member being reciprocable axially relative to the base member in at least one angular position thereof, cam means on opposing surfaces of the base member and the cap member for controlling axial reciprocation of the cap member relative to the base member, and a valve operating member carried by the cap member, said valve operating member being aligned with the opening in the base member.

8. In a combined dispenser and valve operating mechanism, the combination as defined in claim 7 wherein the cam means on opposing surfaces of the cap member and the base member include an annular groove on the cap member and an annular rib on the base member fitting into said groove, the groove having cam surfaces on its bottom and the rib having matching cam surfaces on its top.

9. In a combined dispenser and valve operating mechanism, the combination as defined in claim 8 which includes a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaging with the sides thereof.

10. In a combined dispenser and valve operating mechanism, the combination as defined in claim 8 which includes a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaging with the sides thereof, and said cap member contains a discharge outlet communicating with the opening in the base member through said sleeve.

11. In a combined dispenser and valve operating mechanism, the combination as defined in claim 8 which includes a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaging with the sides thereof, and interengaging means on the base member and the sleeve for holding the cap member in place on the base.

12. In a combined dispenser and valve operating mechanism for a pressurized container, the combination which includes a base member adapted to be mounted in a fixed position on a container, said base member having an opening extending therethrough, a cap member rotatably mounted on top of the base member, said cap member being reciprocable axially relative to the base member in at least one angular position thereof, cam means on opposing surfaces of the base member and the cap member for controlling axial reciprocation of the cap member

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relative to the base member, and sealing means for preventing leakage between the opposing surfaces of the cap member and the base member, said sealing means including a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaging with the sides of said opening.

13. In a combined dispenser and valve operating mechanism for a pressurized container, the combination which includes a base member adapted to be mounted in a fixed position on a container, said base member having an opening extending through, a cap member rotatably mounted on top of the base member, said cap member being reciprocable axially relative to the base member in at least one angular position thereof, one of said members having a discharge outlet communicating with the opening in the base member, sealing means for preventing leakage between opposing surfaces of the cap member and the base member, said sealing means including a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaging with the sides of said opening, and a valve operating member carried by the cap member, said valve operating member being aligned with the opening in the base member.

14. In a combined dispenser and valve operating mechanism for a pressurized container, the combination which includes a base member adapted to be mounted in a fixed position on a container, said base member having an opening extending therethrough, a cap member rotatably mounted on top of the base member, said cap member being reciprocable axially relative to the base member in at least one angular position thereof, cam means on opposing surfaces of the cap member and the base member for controlling axial reciprocation of the cap member relative to the base member, one of said members having a discharge outlet communicating with the opening in the base member, sealing means for preventing leakage between opposing surfaces of the cap member and the base member, said sealing means including a sleeve of flexible material carried by the cap member, said sleeve extending into the opening in the base member and engaged with the sides of said opening, and a valve operating member carried by the cap member, said valve operating member being aligned with the opening in the base member.

15. In a combined dispenser and valve operating mechanism for a pressurized container, the combination as defined in claim 14 which includes interlocking means on the flexible sleeve and the base member for securing the cap member to the base member.

16. In a combined dispenser and valve operating mechanism for a pressurized container, the combination as defined in claim 14 wherein the valve operating member is carried by the flexible sleeve and extends into the opening in the base member.

17. In a combined dispenser and valve operating mechanism for a pressurized container, the combination as defined in claim 14 wherein the cap member contains the discharge outlet and said outlet communicates with the opening in the base member through the flexible sleeve.

18. In a combined dispenser and valve operating mechanism for a pressurized container, the combination as defined in claim 14 which includes an index member carried by the base member, said index member cooperating with the cap member for indicating the angular position of the cap member relative to the base member.

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