This invention relates to valve actuating caps for pressurized dispensers and particularly to such caps of novel construction and mode of operation. The usual pressurized spray dispenser for household, boudoir and like use comprises a container for the mixture to be dispensed with a centrally ascending hollow discharge valve control element which when depressed will laterally spray the contents of the container. The present invention relates to a novel cap construction which is mounted over the top of the container and contains a movable member adapted when actuated to depress the valve control element, without removing the cap.

In its preferred embodiment the invention comprises a snap-on cap for the container having an axially slidable manually operable conduit member of special construction and mounting adapted to depress the valve control element.

It is therefore the major object of this invention to provide a cap and valve control assembly of simple construction for a pressurized dispenser container wherein the cap is removably mounted on the top of the container and includes a novel shiftable member that may be manually actuated to control the discharge valve of the container without removal of the cap.

A further object of the invention is to provide a cap and discharge valve control assembly for a pressurized container of the type characterized by an upstanding valve control element formed with a discharge passage and spring biased to closed position, wherein a special manual valve actuating member is freely slidable mounted on the cap and is formed with a passage constituting an effective continuation of the passage through said element.

Another object of the invention is to provide a novel cap and discharge valve control assembly for a pressurized container having an axially slidable valve actuating member adapted to engage the usual valve control element of the container and having an outlet passage aligned with a discharge passage through said valve element.

It is a further object of this invention to provide a novel cap and discharge valve control assembly for a pressurized container of the type characterized by an upstanding valve control element formed with a discharge passage and spring biased to closed position, wherein a special manual valve actuating member is freely slidable mounted on the cap and is formed with a passage constituting an effective continuation of the passage through said element.

Further objects will appear as the description proceeds in connection with the appended claims and the annexed drawings wherein:

FIGURE 1 is a side elevation partially broken away and in section showing the novel cap and actuator structure of the invention according to a preferred embodiment installed on a conventional type pressurized dispensing container;

FIGURE 2 is a top plan view of the cap assembly of FIGURE 1;

FIGURE 3 is one side elevation of the cap assembly of FIGURE 1 apart from the container;

FIGURE 4 is the opposite side view of the cap assembly of FIGURE 3;

FIGURE 5 is a top plan view of the cap assembly with the valve actuator member removed;

FIGURE 6 is a side elevation looking in the same direction as FIGURE 3, showing the valve actuator member apart from the cap assembly;

FIGURE 7 is a side elevation of the valve actuator member looking at right angles to FIGURE 6;

FIGURE 8 is a fragmentary bottom plan view of part of the valve actuator member of FIGURE 7 substantially on line 7—7 of FIGURE 7;

FIGURE 9 is a medial section through the valve actuator member, substantially on line 9—9 of FIGURE 2;

FIGURE 10 is a side elevation of the cap of FIGURE 1 with the valve actuator member removed;

FIGURE 11 is a bottom plan view of the cap of FIGURE 10; and

FIGURE 12 is a section substantially on line 11—11 through FIGURE 10.

Referring to FIGURE 1, the novel cap and valve actuator assembly of the invention is mounted on a standard type pressurized dispenser container 12.

Container 12 comprises a rigid, usually sheet metal can body 13 closed at its top by a domed cover member 14 which has its periphery clinched tightly around the can body by a stiff formed bead 15. In the disclosed embodiment cover member 14 is formed with a channel 16 inwardly of bead 15 with the outer periphery 17 of the channel being cylindrical and the inner periphery 18 of the channel formed with an outwardly projecting annular bead 19. The lower end of the can body 13 is closed by a bottom cover 21 clinched tightly thereupon by a bead such as that at 15. The can body 13 and both top and bottom covers form a relatively stiff enclosure adapted to contain a mixture of liquid and vapor under considerable internal pressure.

Upstanding from the center of domed upper cover 14 is a valve control element 22 which is reciprocably axially of body 13, spring biased upwardly in FIGURE 1, and formed with a discharge passage 23. This valve control element 22 is of known construction and known manner of mounting within the container, and a small depression of element 22 toward the interior of the container, downwardly in FIGURE 1, will result in opening a valve (not shown) inside the container to permit discharge of the container contents through passage 23. This type of valve control element and the valve mechanism associated with it may be that disclosed in United States Letters Patent No. 2,631,614 to which attention is directed for further detail.

Preferably at least the upper end of valve control element 22 is a nylon or like hollow cylindrical tube.

The cap assembly 11 consists essentially of only two parts, a cap 24 which may be an integral molded member of polyethylene or like relatively stiff but resilient plastic and an integral valve actuating member 25 which is axially reciprocably mounted on the cap 24. Member 25 may also be a rigid molded part of light non-metallic plastic material.

Cap 24 has preferably a cylindrical side wall 26 that at its lower open end (FIGURE 12) is formed with a continuous deep recess 27 intersected by a plurality of, here four, short axial inner surface grooves 28. An continuous internal shallow depression 29 is also formed in the cap wall near its open end, and in the assembly of FIGURE 1 this depression 29 is adapted to receive the can bead 19. The foregoing recess and groove arrangement defines a flexible lip structure 31 on which depression 29 is located.

When cap 24 is mounted upon the top of container 12 with its lower end in channel 16 the outer cylindrical surface 32 of the cap is backed by outer channel periphery 17, and the flexible lip structure 31 provides a snap-on friction fit with the container cover. Any other suitable snap-on fit may be used between the lower open end of the cap and the container top.

Cap 24 is formed with a relatively thick top wall 33 preferably having an upwardly concave upper surface 34.

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(FIGURES 2, 5 and 12). Wall 33 is interrupted by a diametrically extending slot 35 the side wall surfaces of which are smooth and parallel to the longitudinal axis of the cap but are equally and oppositely inclined and symmetrically disposed on opposite sides of the cap axis. As shown best in FIGURE 4 one end of slot 35 intersects the rear side of cap 24 in an axially extending opening 37 and, as shown in FIGURE 12, the front side of cap 24 in an axially extending opening 38.

Referring to FIGURE 5, the front side wall of the cap 24 is formed with a shallow flat-bottomed recess 39 which is larger than opening 38, and parallel guide rails 41 are formed along the sides of opening 38 just inwardly of recess 39. A similar coextensive flat-bottom recess 40 is formed (FIGURE 12) in the inner surface of the front side wall of cap 12, and the lower edge of recess 40 forms an internal ledge 42.

Referring mainly to FIGURES 2, 6, 7, 8 and 9 the manually operable valve actuating member 25 is axially slidably mounted for free reciprocal movement in slot 35. The opposite flat smooth side walls 43 converge symmetrically toward a substantially keystone shaped forward head 44 having opposite parallel side guide grooves 45 that interfit with guide rails 41 of the cap 24. The lower end of head 44 is disposed within a downwardly open trough groove 46 that fits slidably over the vertical guide lip 47 that extends along the lower edge of front opening 38. A flat bottom surface 48 is formed on member 25 adapted to engage ledge 42.

The rear end of member 25 is an arcuate skirt 49 (FIGURES 4 and 9) that has a straight lower edge surface 50 adapted to rest on an internal wall ledge 51 formed by an internal wall recess 52 just below opening 37. Ledges 42 and 51 are at the same level. Skirt 49 is slidably guided by recess 52.

The actuating member (enclosed angle about 25°) of walls 43 are such that member 25 is smoothly slidably guided in slot 35. Rails 41 interfit smoothly slidably with grooves 45, and groove 46 fits slidably with lip 47, and this arrangement at the head of member 25 not only aids the slide guiding of member 25 on the cap 24 but it also prevents displacement of member 25 diametrically outwardly of slot 35.

In assembly the member 25 is simply pushed into the open top of slot 35, and to retain member 25 against accidental axial displacement out of the slot 35 the upper edge of slot 35 are formed with integral rounded beads 53 (FIGURE 4) that project slightly into the slot. During assembly member 25 is forced past these beads 53 which is easily possible due to the inherent resiliency of the plastic composing it, and then the beads resume initial condition to block upward movement of member 25.

The upper surface 54 of valve actuating member 25 is concave with the same curvature as cap surface 34, and near the rear side a concave finger receiving depression 55 is formed at the side opposite head 44.

Referring now mainly to FIGURES 1, 6, 7 and 9 a central hollow boss 56 depends from valve actuating member 25 and at its lower end boss 56 is formed with a socket 57 fitting snugly over the valve stem element 22 as shown in FIGURE 1 with the upper end of element 22 abutting the bottom of socket 57. As shown in FIGURE 9, a through passage 58 is formed through valve actuating member 25, this passage 58 extending upwardly from socket 57 where it aligns openly with valve stem passage 23 and then radially outwardly to terminate in a discharge mouth 59 in head 44. Where the discharge is to be in the form of a spray, a small bore nozzle plug 61 is mounted in mouth 59.

The cap assembly 11 is made apart from the container. The separately molded cap 24 and actuating member 25 are operatively assembled by inserting member 25 into slot 35. Now, with the cap assembly 11 apart from container 12, the member 25 is freely axially slidably mounted between limits defined on the one hand by surfaces 48 and 50 abutting ledges 42 and 51 respectively, and on the other hand by beads 53 engaging the upper part of member 25.

To assemble the cap and container, the open end of cap assembly 11 is snapped into channel 16. This automatically aligns valve stem 22 to be received within socket 57, when the axially charge passage will completely extend through member 25. The relative dimensions of the parts are such that after stem 22 bottoms in socket 57 further axial movement of cap 24 to snap into the channel will lift free floating member 25 within the cap. Then when cap 24 is in final position in the container, the valve actuating member will be resting by gravity upon the valve stem 22, with its upper surface 54 substantially continuous with cap surface 34, and with its lower end well above ledges 42 and 51.

The slide mounting member 25 is sufficiently frictionless, and the weight of member 25 so small compared to the spring bias of stem 22, that there is no depression of stem 22 and hence no discharge of the container contents as the cap assembly is placed on the container.

To secure the container the operator merely points the head side 44 toward the area to be sprayed, and with his finger depresses member 25. Before member 25 bottoms on the cap leads valve stem 22 will have been sufficiently to open the internal valve, and the container contents will discharge under pressure. It will be noted that since head 44 is located essentially outside the cap 24, the discharge from the mouth of passage 58 does not have to pass through any part of the cap. Release of member 25 by the operator restores the parts to original position.

While the upper ends of cap 24 and member 25 are concave, they could be made flat or in any other corresponding shape, a finger depression like that at 55 being in all embodiments. The bevelled head shape of member 25 notifies the operator the spray direction immediately and no special indicia is needed.

The cap assembly of the invention comprises two mold components that are easily assembled, and mounting of the assembly on the container automatically locates the parts in position for immediate use. The structure is simple and inexpensive, and reliable in operation, with only one moving part in the cap assembly.

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 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. An actuator cap assembly for a pressurized container of the type having an upwardly spring biased projecting moulty mounted hollow valve stem which when depressed toward the container will permit discharge of the container contents through said stem, said assembly comprising a hollow body open at its bottom and adapted to enclose the top of said container including said stem, a top wall and an annular side wall on said body, means providing an upwardly open slot extending entirely across said top wall and intersecting said side wall at an upwardly open recess, said wall, means providing a removable snap-on fit for said body and said container and a rigid valve operating member slidably guided on said side wall at said recesses extending entirely across said top wall and reciprocally mounted on said body for free movement in said slot on the axis of said container of member eccentrically带动 valve stem without removing said cap assembly, said valve operating member being a separate member with respect to said body and resting in the assembly directly upon
said valve stem but being of insufficient weight to depress said valve stem, and said valve operating member having a depending hollow portion telescoped with the upper end of said valve stem and being formed with a discharge passage that communicates through said portion with the valve stem passage and extends to a laterally directed discharge aperture in the side of said valve operating member.

2. An aerosol type container and cap assembly of the type that permits discharge of the container contents without removal of the cap comprising a container for fluid under pressure having an upwardly projecting spring biased hollow stem for controlling a valve within the container, depression of the stem toward the container opening said valve to discharge said fluid, said cap assembly comprising a hollow body open at its bottom and having a side wall formed for attachment to the container, said body extending above the container and enclosing said projecting stem, and a structurally separate manually operable valve actuator member in the form of a transverse rigid member mounted for free reciprocation in an upwardly open guide slot in the top of said body, said rigid member normally directly resting on said valve stem in the assembly and said guide slot extending entirely across said body between upwardly open diametrically opposite side wall recesses, and said transverse member having an intermediate hollow portion telescoped with said stem and slide guide connections at opposite ends with said body at said recesses whereby there is provided an accessible balance sensitive valve actuator member normally supported in the assembly only by resting on said stem with the weight of said actuator member being insufficient to depress said stem, and means providing a fluid discharge passage through said actuator member from said hollow portion to a laterally directed discharge mouth essentially outside said body, and means for preventing displacement of said valve actuator member out of said slot comprising internal side wall ledges in the body in the path of movement of said actuator member toward the container.

3. An actuator cap assembly for a pressurized container of the type having an upwardly projecting and spring biased reciprocably mounted hollow valve stem which when depressed toward the container will permit discharge of the container contents through said stem, said cap assembly comprising a hollow body open at its bottom and adapted to enclose the top of said container including said stem and having a substantially diametrical open upwardly extending guide slot across its upper extremity means for attaching the lower end of said body to said container, a valve operating member extending entirely across said cap body freely reciprocable in said slot and being accessible for actuation of said valve stem without removing the cap assembly, coacting slide guide means on the opposite ends of said member and the body wall, abutment means at opposite ends of said slot limiting reciprocable movement of said member in said slot and means providing a hollow central portion on said member adapted to telescope over and axially abut said stem, said member having a discharge passage therethrough extending from said portion where it communicates with said stem to a laterally directed discharge aperture in one end of said member.

4. The actuator cap assembly defined in claim 3, wherein said guide means prevent substantial lateral displacement of said member along said slot.

5. The actuator assembly defined in claim 3 wherein said slot has vertical flat side walls that converge toward the front side wall, and said member is correspondingly shaped.

6. The actuator assembly defined in claim 3 wherein said guide means at one end of said member comprises spaced vertical rails along the edge of a side wall opening in said body and a head structure on said member formed with side grooves interfitting with said rails.

7. The actuator assembly defined in claim 3 wherein when said assembly is mounted on the container the entire weight of said member rests by its weight on said valve stem in an upwardly displaced position above the lowermost of said abutment means and wherein the upper surface of said member adjacent the sides of said slot is shaped to be a substantial continuation of the top surface of said body when said member is in said upwardly displaced position.

8. An actuator cap assembly for a pressurized container or the like consisting essentially of an integral hollow open top body having a resilient rim around its lower edge for snap-on fit with a container and a top that is closed except for an upwardly open slot that extends entirely from front to rear between upwardly open side wall recesses, and a valve operating member freely reciprocable in said slot on side wall guide means at said recesses that prevent lateral displacement of said member in said slot, there being abutment means formed in the body side walls to limit displacement of said member toward the bottom of said body and means along the upper edges of said slot permitting introduction of said member into said slot during assembly with said body but preventing displacement of said member upwardly out of said slot.

9. The cap assembly defined in claim 8, wherein said guide means comprises an interfitting rail and groove connection between said body side wall and one end of said valve operating member.

10. An aerosol type container and cap assembly of the type that permits discharge of the container contents without removal of the cap comprising a container for fluid under pressure having an upwardly projecting spring biased hollow stem for controlling a valve within the container, depression of the stem toward the container opening said valve to discharge said fluid, said cap assembly comprising a hollow body open at its bottom and having a side wall formed for attachment to the container, said body extending above the container and enclosing said projecting stem, and a manually operable valve actuator member in the form of a transverse rigid member mounted for reciprocation in an upwardly open guide slot in the top of said cap, said actuator member being a separate member with respect to said body and mounted for free displacement in said slot so as to rest directly upon said valve stem, said guide slot extending entirely across said body between upwardly open diametrically opposite side wall recesses, and said valve actuator member having an interfitting head structure on an upwardly open guide slot in the top of said cap, said guide slot extending...
ing entirely across said body between upwardly open diametrically opposite side wall recesses, and said bar having an intermediate hollow portion telescoped with said stem and slide guide connections at opposite ends with said body at said recesses whereby there is provided an accessible balanced sensitive valve actuator member normally supported in the assembly mainly only by resting on said stem with the weight of said member being insufficient to depress said stem, means providing a fluid discharge passage through said member from said hollow portion to a laterally directed discharge mouth essentially outside said body, said slot having flat side walls converging toward the front of said body, and the front and rear side walls of said body being formed with slide surfaces for guiding corresponding surfaces at the opposite ends of said actuator member, and means for preventing displacement of said actuator member out of said slot.

12. The aerosol type container assembly defined in claim 11 wherein said last means comprises internal side wall ledges in the body in the path of movement of said member toward the container.

13. An actuator cap assembly for a pressurized container or the like consisting essentially of an integral hollow open bottom body having a side wall provided with a resilient rim around its lower edge for snap-on fit with a container and a top that is closed except for an upwardly open slot that extends entirely from front to rear, and a valve operating member freely reciprocable in said slot on side wall guide means that prevent lateral displacement of said member in said slot, there being abutment means formed in the body side walls to limit displacement of said member toward the bottom of said body and means along the upper edges of said slot permitting introduction of said member into said slot during assembly with said body but preventing displacement of said member upwardly out of said slot, said body side wall being annular and said resilient rim comprising a continuous edge recess that is deep enough to form an internal flexible lip structure, and said lip structure being longitudinally split for added flexibility and being formed around its inner surface for engagement with a corresponding container formation.

References Cited by the Examiner

UNITED STATES PATENTS

2,706,660 4/1955 Johnson et al.
2,781,950 2/1957 Pritchard 222—394
3,075,709 1/1963 Green 222—394 X
3,107,033 10/1963 Sanborn 222—182 X
3,139,223 6/1964 Kruck 222—394

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