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H. A. STEINKAMP
AEROSOL CAN ASSEMBLY AND THE ACTIVATOR CAP FOR
COMPLETELY DISPENSING THE CONTENTS
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3,137,414

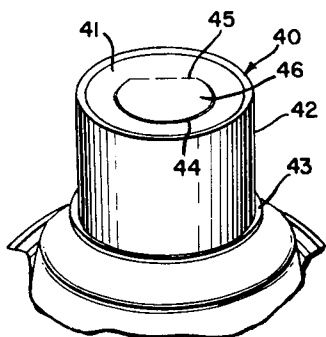


FIG. 1.

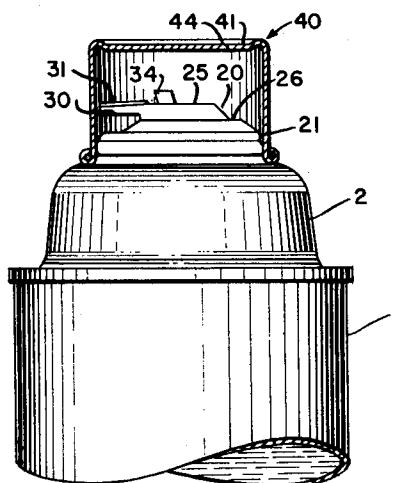


FIG. 2.

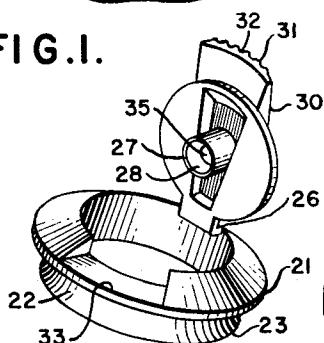


FIG. 5.

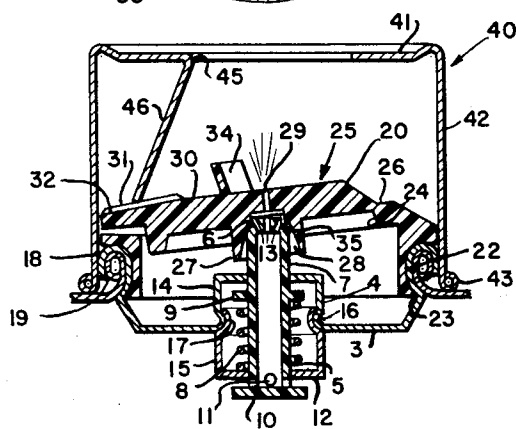


FIG. 4.

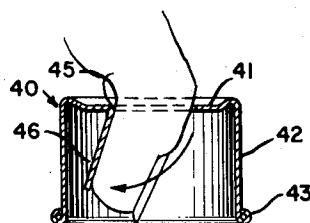


FIG. 3.

INVENTOR
Herman A. Steinkamp

BY

Paul D. Boone

ATTORNEY

1

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AEROSOL CAN ASSEMBLY AND THE ACTIVATOR CAP FOR COMPLETELY DISPENSING THE CONTENTS

Herman A. Steinkamp, Baltimore, Md., assignor to The Eastern Cap and Closure Company, Baltimore, Md., a corporation of Maryland

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4 Claims. (Cl. 222—182)

This invention relates to a cap for directly actuating the valve mounted on pressurized liquid spray containers. It relates more particularly to a novel actuator cap or cover for actuating the valve on the spray container, wherein the valve stem on the container is indirectly manipulated by a portion of the metal cap to put the valve in open position; and as a result, the contents of the pressurized container will be discharged. It relates more particularly to a novel cap which can be quickly transformed so that, when so transformed and correctly mounted on the end of the aerosol container, it will automatically hold the spray valve of the container in open position for the complete discharge of its contents as an aerosol spray.

The invention also relates to the entire aerosol can structure, which is the combination of the cylindrical, metal pressurized container with a valve for releasing the contents, a plastic spray head which is capable of engaging the neck ring of the metal container, and a metallic valve actuator cap which frictionally engages the edges of the plastic spray head and the neck ring of the container to stay in place upon the container.

It has been proposed (U.S. Patent No. 2,941,700) to have a valve actuator for a closure, and a spray head for the discharge of the contents of the container in response to depression of the spray head, characterized by a hand lever removably pivotally mounted on a bar and extending over the spray head, whereby manual downward pressure depresses the spray head. The spray is discharged in a lateral direction, the opening in the spray head being on the front side.

It has also been proposed in U.S. Patent No. 2,841,443 to have a slide on the valve body and wherein it is not required that the operator deflect the cap itself to actuate the valve stem in open position. This cap sprays in a semi-lateral direction. But a disadvantage of this cap is stated in this patent, namely that the cap should be "removed when the bomb is not in use, inasmuch as slight pressure accidentally imposed on the novel cap, as for example during shipment, might accidentally cause discharge of the bomb."

The cap of the present invention can be kept on the pressurized container during shipment, display purposes in stores, and at all times. In its non-actuated form it protects the spray valve from dust and dirt as does the conventional cap of aerosol assembly spray units to be seen in stores. The novel cap of the present invention, which may be removably mounted on the upper end of an aerosol spray container, is both economical to manufacture and convenient to use. This novel cap is removed from the container to set or form it into its operating position, then replaced upon the pressurized container to actuate the valve stem of the container to open position and thereby spray the contents of the container as an aerosol.

The cap of the present invention may be used with pressurized cylindrical containers of various kinds which have a reduced neck portion and valve cup positioned in the reduced neck portion, where the valve cup has a valve stem that is vertically movable, controlling the admission of the contents of the container to the valve stem, a spray head affixed or joined to the said container, the spray head

2

having a lever capable of pressing down upon the valve stem.

The above and other advantages of my invention will become apparent from the following description and the accompanying drawing in which I have illustrated the activator cap of my invention associated with a conventional pressure type dispensing container, and with a plastic spray head that engages the inside circumferential edge and top edge of the valve cup of the container, the plastic spray head having a lever that actuates the valve stem of the container. Throughout the description reference will be made to the drawing wherein like characters denote corresponding parts throughout the several views, and in which:

FIGURE 1 is a side elevation of the activator cap of my invention mounted upon a pressurized aerosol container.

FIGURE 2 is a section view of cap, mounted upon a pressurized aerosol container provided with a spray head.

FIGURE 3 is a sectional view of the aerosol activator cap, showing an individual's finger having pushed the actuator into operating position.

FIGURE 4 is a sectional view of the activator cap of the present invention, mounted in operating position, with sectional view of the spray head and upper portion of the container.

FIGURE 5 is a perspective view of the dismounted spray head with that portion hinged elevated.

I have shown, for the purpose of illustration, a cylindrical container 1 having a reduced neck portion 2, the opening of which is closed by a valve cup 3. In the valve housing, numbered 4 in the drawing, there is a valve numbered 5. There is a valve nozzle 6 through which the liquid and gas under pressure in the container may be released upon activation of the valve stem 7 (FIGURE 4), which normally is held closed by the pressure in the container and by the compression of the spring 8 acting on the head 9 on its under side. There is attached a plate 10 to the lower end of the valve stem 7. And there is a hole 11 at the very base of the valve stem. When the valve stem 7 is in a closed position, due to the gaseous pressure in the container 1 and the compression of the spring 8, the plate 10 abuts the lower side of the base portion of the valve housing. And in this position, communication of the passageway in the valve stem with the interior of the container is prevented.

In the embodiment shown in the particular spray unit, the channel in the valve stem 7 is divided by three partitions numbered 13, spaced at 120°, which facilitate the production of a spray in the form of an aerosol, when the said unit is in open position.

The upper section 14 of the valve housing is thus seen (FIG. 3) to be a part of the valve cup. The valve cup 3 terminates in a neck ring 18, inside U-shaped portion of which fits tightly over the curled edge 19 of the reduced neck 2 of the container 1. The valve box or housing in this embodiment, as is to be seen from FIGURE 4, consists of an upper section, numbered 14, and a lower section, numbered 15. The concave portion bearing numeral 16 of the said upper section fits into the co-operating larger concave section numbered 17 of the said lower section.

A spray head 20 is mounted in the valve cup 3. It is made by a conventional injecting molding practice, utilizing thermoplastic material, as for example polyethylene. It has therefore, sufficient elasticity and resiliency to function in the manner presently to be described. It has a ledge 21, the circular underside of which is very slightly concave to fit snugly upon the ridge-portion of neck ring of the valve cup. The downwardly-extending skirt portion 22 of the spray head has a slightly outwardly flared lower edge 23. When pressed down in

place, the underside of this spray head 20 sits upon the ridge-shaped portion of the neck ring of the valve cup, its skirt portion 22 and outwardly flared edge 23 clinging fast to the inside curved wall of the valve cup. The elastic nature of the plastic in conjunction with the contour of the downwardly projecting elements just described, result in the spray head 20 remaining firmly yet detachably secured to the cylindrical container.

In the embodiment shown in the drawing, the circular ledge on its up-side has a short vertical portion merging into an inwardly inclined or rising section 24 integral with the ledge of the spray head 20; it forms an angle of about 35° to the horizontal. A tab made from the same plastic has a relatively narrow hinge connection 26 at one end of the tab (considered the front end in this description); it is otherwise entirely free from attachment to the spray head.

The tab is provided at its underside with a hub 27 having therein a socket 28 adapted to receive and closely fit the upper end of valve stem 7. There is a shoulder at the upper end of the socket. And with said socket communicates a very narrow outlet passage 29, which extends to the exterior of the spray head. Through this passage 29 material to the socket 28 from the interior of pressurized container 1 may be discharged for its intended use.

The tab 25 is circular in form, except for the hinge connection 26, and there is a narrow space between its circular periphery and the upper extremity inside cylindrical wall of the spray head. Extending from the hinge 26 there is a lever element 30 of the spray head, which lever extends with a flare to the opposite side of the spray head. It has a projecting part 31 with a plurality of slightly raised radii 32 thereon to make it easier for the operator's thumb to hold fast to it during the spraying operation. This projecting part is not as thick as the rest of the lever element, in fact it tapers in thickness toward the periphery.

In a previous paragraph, reference was made to the circular-shaped ledge 21, with short vertical portion merging into rising section 24 to which at the front thereof a circular tab is affixed at hinge 26. There is a conical section 33 of an arc of about $\frac{3}{4}$ of a circle, completely cut out of the ledge directly below that. The narrow passageway 29 for the discharge of the container's contents, previously referred to, extends vertically through the tab 25 and the lever 30. On the rear side of the passageway 29, there is a shield element 34.

In the non-operating position, the top surface of cylindrical tab 25 of the spray head lies flush with the uppermost extremity of the incline section 24. This is depicted in FIG. 2 of the drawing. When pressure is put on the end 31 of lever 30, the projecting part fills the space 33. And the shoulder 35 of hub 27 in turn forces the valve stem 7 down, whereby the passageway or hole 11 comes into contact with the interior of the pressurized container 1. As a result the contents are sprayed as an aerosol from the passageway 29 of the spray head.

So far the description has been confined to the cylindrical pressurized container, the valve structure and the spray head. None of these, however, constitute any part of the present invention. But the aforesaid description appears to be necessary in order to show the operation of the cap of my invention.

My invention is the novel cap or cover for activating the spray head affixed to the pressurized container and thereby the valve structure, which latter is a part of the pressurized container structure. This cap will now be described.

My novel cap 40 is formed from thin metal. It has a flat top 41 circular in construction, which merges into vertically depending cylindrical side wall 42. The latter terminates in an outwardly curled edge 43. There is cut in the top of the cap an arc 44 of a circle that approximates $\frac{3}{4}$ of the circumference of a circle. Between

the end of the cut on each side there is formed a crease 45, the purpose of which will become obvious. In the form in which it is manufactured and placed in non-activating position on the pressurized container, the actuator 46 extends downwardly about 1-3° from the horizontal. When it is desired to use the cap to actuate the lever of the spray head and in turn the valve stem, an individual simply pushes down upon the actuator 46 with his second finger, whereby it assumes the position shown in FIG. 3 of the drawing. The individual then simply removes his finger.

The cap, which now is converted to the form shown in FIG. 3, is grasped in one hand, and, while holding the container 1 firmly with the other hand, centered above the spray head 20. Precautions at this stage must be taken to make sure that the actuator 46 is positioned transversally in position to the wide end of the lever 30. Thereupon, the individual pushes down upon the top of the cap. And in so doing, the lowermost part of the actuator depresses the free end of the lever 30 to the position shown in FIGURE 4. The lower end of the cylindrical wall 42 springs around the neck ring of the valve cup on the container, with the curled edge 43 of the cap coming to rest upon the rather flat portion on the neck of the pressurized container. When the lever 30 has been depressed to the position shown in FIG. 4, the valve stem 7 has been forced downwardly, and as a result the hole 11 therein opens into the interior of the pressurized container 1. The gas in the latter forces the liquid up through the interior of valve stem 7, out through passageway 29, and the wide opening in the top of the cap. Because the cap 40 is firmly secured on the pressurized container 1, actuator 46 will continue to hold lever 30 of the spray head in depressed position. And the spraying will continue with no further attention required for its spraying, either until the contents of the container are completely discharged or until the operator has completed his task. To secure cessation of the spraying, all that is necessary is for the operator to lift up the cap on the side where the pressure of actuator 46 upon lever 30 exists. Since in the use of the novel cap of the present invention pressure of an individual's finger upon lever 30 is not required to produce a spray, tiring of a person's fingers is eliminated.

From the foregoing it will be seen that a novel and advantageous provision has been disclosed for attaining the desired ends, to wit: a cap simple in structure which comes mounted on the aerosol container to protect the valve structure, and which, when modified and put in place again actuates the valve on the said container.

The foregoing detailed description sets forth the invention in its preferred practical form. It will be obvious to those skilled in the art the possibility of modifications therein without departing from the invention. And therefore, it is intended in the appended claims to cover all such modifications, as fall within the true spirit and scope of this invention.

What I claim as new and desire to protect by Letters Patent is:

1. A removable, metallic valve actuator cap suitable for pressurized cylindrically shaped containers, which have a reduced neck portion with a valve cup terminating in a neck ring, there being a valve housing with a vertically movable valve stem therein with an opening near its base normally held in closed position by a spring means, there being further a plastic spray head secured to the inside circumferential and upper surface of the neck ring of the container, to which spray head a tab is hinged at one side to the base portion thereof and extends away from where it is hinged, on the bottom side of which tab there is a hub with a shoulder therein, and there being a lever associated with the tab, a vertical narrow passageway extending through the tab, said lever projecting over a cut-out portion in the spray head, the metallic valve actuator cap for the said pressurized container formed of a substantially flat, circular shaped metal top having a substan-

5

tially vertically depending cylindrical side-wall, terminating in a curl, the said top having a cut-out portion with a creased line extending between the ends of the said cut, whereby the partially detached portion of the cap can be pivotally depressed to constitute an actuator for the valve by depressing the said lever of the spray head.

2. A valve actuator cap as set out in claim 1, wherein the said cut-out portion in the top thereof is substantially circular and is greater in length than half a circle.

3. In an aerosol can structure, the combination of a pressurized container, a plastic spray head and a removable, metallic valve actuator cap for frictionally engaging the spray head and the said container, the latter being characterized by a reduced neck portion with a valve cup terminating in a neck ring, there being a valve housing with a vertically movable valve stem therein with an opening near its base normally held in closed position by a spring means, the said plastic spray head having a circular concave collar joined to the base for engaging the circumferential and upper edge of the container's neck ring, the spray head's upper portion having a tab hinged at one side of the base of the spray head, and extends away from where it is hinged, on the bottom side of which tab there is a hub with a shoulder therein, a lever associated with the tab, a vertical narrow passageway extending through

6

the tab, said lever projecting over a cut-out portion in the spray head, the said metallic valve actuator cap for the pressurized container being formed of a substantially flat, circular-shaped metal top having a substantially vertically depending cylindrical side-wall, terminating in a curl, the said top having a cut-out portion with a creased line extending between the ends of the said cut, whereby the partially detached portion of the cap can be pivotally depressed to constitute an actuator for the valve by depressing the said lever of the spray head.

4. The aerosol can structure as set out in claim 3, wherein the said cut-out portion in the top thereof is substantially circular and is greater in length than half a circle.

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