

[54] **PROCESS OF ASSEMBLING PRESSURE CONTAINER AND OVERCAP**
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[73] Assignee: **The Gillette Company**, Boston, Mass.
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[52] U.S. Cl.**29/428, 29/407, 30/289, 33/1 F**
[51] Int. Cl.**B23p 17/04, B23q 3/18, B26d 7/16**
[58] Field of Search.....**29/407, 428; 30/289; 33/1 F, 33/DIG. 12; 222/402.13, 402.15; 73/343 B, 432 R**

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Primary Examiner—Wayne A. Morse, Jr.
Attorney—R. W. Furlong

[57] **ABSTRACT**
Assembly of a valved pressurized container with an overcap arranged to actuate the valve is facilitated by mounting an oversize actuating member on the valve, then cutting it to size using as a reference the same portion of the container as is in contact with the overcap.

3 Claims, 6 Drawing Figures

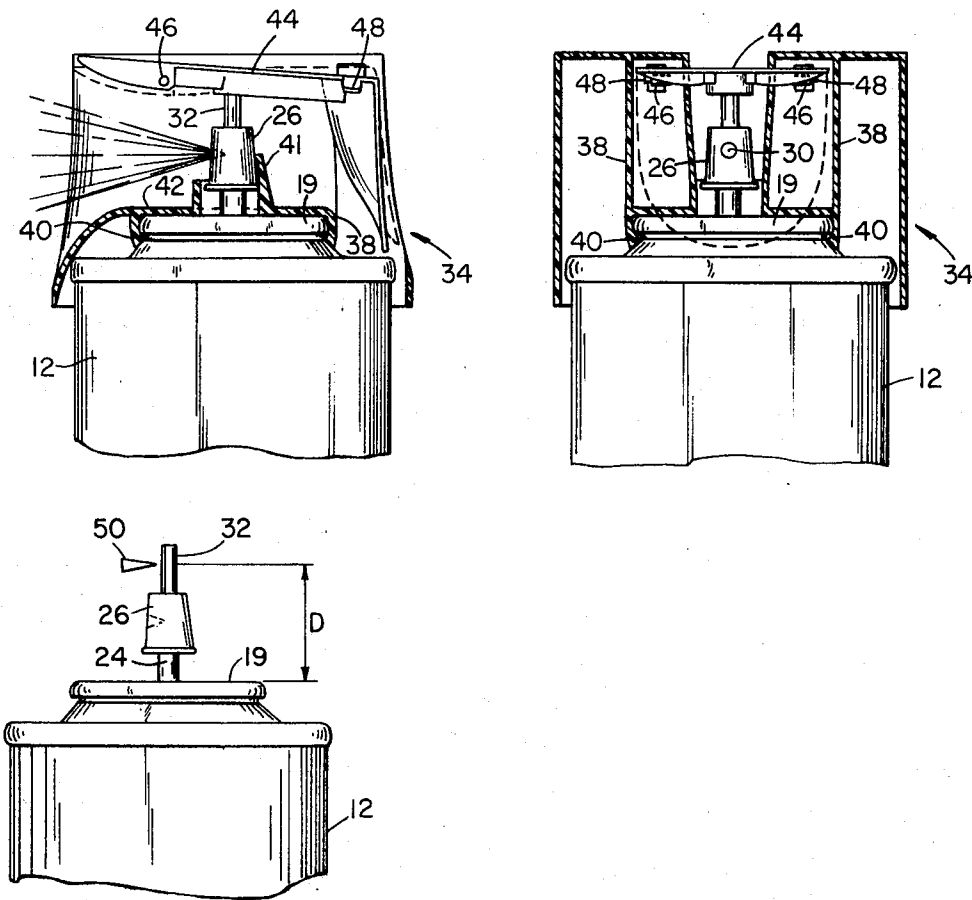


FIG 1

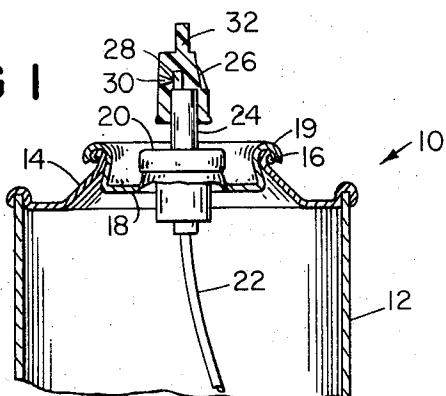


FIG 2

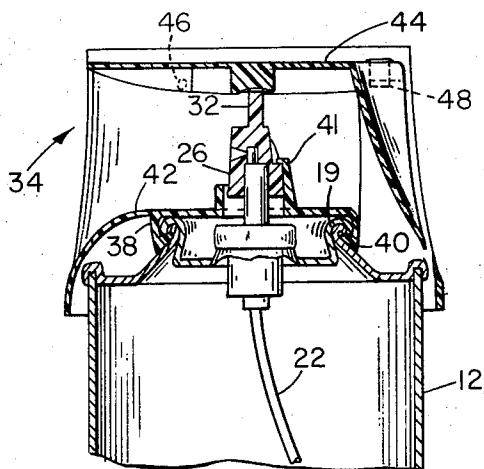


FIG 3

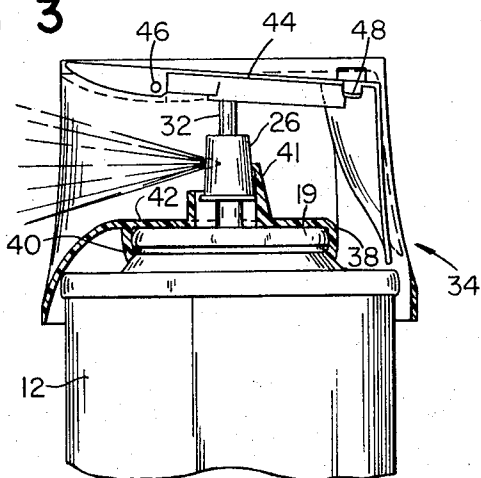


FIG 5

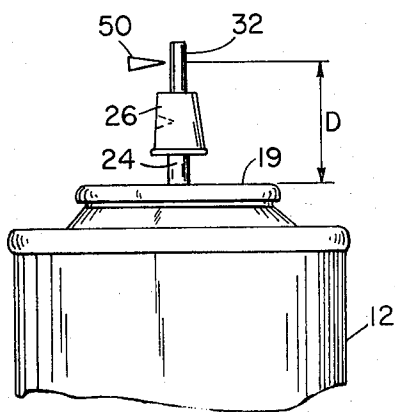
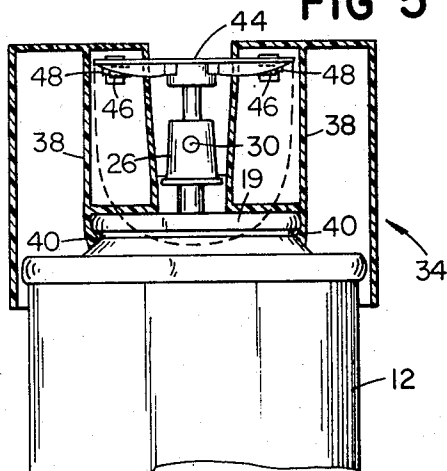


FIG 4

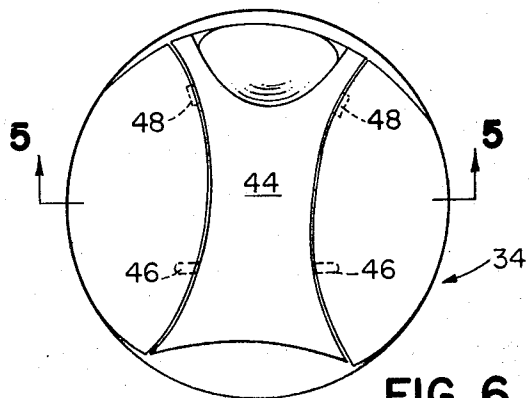


FIG 6

PROCESS OF ASSEMBLING PRESSURE CONTAINER AND OVERCAP

This invention relates to a valved pressurized container of the aerosol type and pertains more specifically to a process for assembling such containers with overcaps of a decorative or protective nature mounted over a dispensing valve.

One type of conventional aerosol container has an upwardly projecting valve-actuating member, usually in the form of a tubular stem having on its upper end a plastic button including a side delivery spray nozzle. The valve and valve actuator are conventionally mounted on a metal cup which is crimped to the neck of the container. It is also conventional to provide for such containers a plastic or metal overcap which is secured to the crimped margin of the cup or to some other upper portion of the container and which serves not only to improve the appearance of the top of the container, but also to protect the valve actuator against damage or accidental discharge, and in some cases, to facilitate stacking of the containers. Such overcaps may have a fingerpiece movably mounted with respect to the remainder of the cap and in position to engage the actuating member to open the valve. Because in large scale production dimensional variations occur in the valve and its actuator and in the cup as well as in the overcap itself, it has been found that in frequent cases the fingerpiece of the cap is not in proper relation to the valve actuator after assembly. While in some cases manual adjustment of the assembled container is possible, such an operation is difficult and expensive to carry out, and in any event there remains an excessively large number of assembled containers which must be rejected. In addition, the step of crimping the valve cup to the beaded or curled upper margin of the container neck involves not only radial expansion of the lower part of the cup beneath the bead of the neck, but also some vertical displacement of the bottom of the cup as a necessary consequence. This vertical displacement is not closely controlled and is an additional source of dimensional variation causing improper positioning of the valve with respect to the fingerpiece.

The present invention provides a process for cutting off the upper part of the valve member at a fixed spacing or distance from an upper portion of the container, then mounting the overcap in contact with the same upper fixed portion of the container so that the valve member and fingerpiece are consequently in proper relation to each other. The assembly method of the present invention compensates for a large part of the dimensional variations in the several parts by relating both the valve member and the overcap to the same fixed upper portion of the container, making it possible to employ relatively wide manufacturing tolerances in the fabrication of the various parts.

In the drawings:

FIG. 1 is a view in vertical section, partly broken away, showing a preliminary stage in the assembly process;

FIG. 2 is a view in vertical section partly broken away showing the container with the cap in place after assembly has been completed, with the valve in closed position;

FIG. 3 is a view similar to FIG. 2 with the valve in opened or actuated position;

FIG. 4 is a view similar to FIG. 1 showing the step of cutting off the end of the valve actuator and indicating diagrammatically the reference position from which the location of the cutting element is gaged;

FIG. 5 is a view in vertical section taken at right angles to FIG. 2; and

FIG. 6 is a top plan view of the cap.

As shown in the drawings, container 10 which typically is made of sheet metal includes a substantially cylindrical side wall 12 and a metal neck portion 14 having its circular outer margin crimped to the top of cylindrical side wall 12. Neck portion 14 which extends generally upwardly and inwardly from its outer margin terminates in a bead 16, which is rolled outwardly and downwardly to form a circular central opening, in which is mounted a metal cup 18 which has its outer margin 19 overlying bead 16 and crimped or rolled with the bead 16 so as to secure the cup 18 in sealing relation with the opening in neck portion 14. Cup 18 carries mounted on it valve 20 connected at its inner side to dip tube 22 extending to the bottom of the container. The valve is provided with a hollow tubular element 24 extending upwardly from the top of the container and which has mounted on its upper end in frictional engagement therewith a button 26, which typically is made of synthetic plastic material, and which is provided with a hollow bore 28 communicating with tube 24 and with a side delivery nozzle aperture 30. Button 26 is also provided with an extension 32 molded integral with the button and preferably smaller in diameter than the button extending upwardly therefrom. Tube 24 and button 26 together form a valve actuator which is spring-biased to the upper, closed position of the valve and which, when moved downwardly by external force, serves to actuate the valve to open position releasing the contents of the container through element 24 and nozzle 30.

Cap 34 (FIGS. 2 and 3) which may be made of metal or any other suitable material is preferably made of molded synthetic plastic as illustrated in the preferred embodiment and is provided with an outer peripheral skirt which overhangs the upper marginal portion of side wall 12 of the container, and an inner cylindrical skirt 38 having an inwardly directed flange 40 at its lower margin in position to engage beneath the outer edge of rolled marginal portions 16, 19 of neck portion 14 and cup 18. The skirt 38 an flange 40 are sufficiently flexible and elastic to permit the flange to expand as it is forced downwardly over the margin 19 of the cup during assembly. Cap 34 is provided with a valley or throat extending diametrically across it and having an aperture in its bottom 42 through which tubular element 24 protrudes carrying button 26 to permit the spray issuing from nozzle 30 to exit without removing the cap. A key 41 is formed integrally with the cap to mate with a keyway in button 26 to ensure proper orientation of nozzle 30 with the throat of the cap. The bottom 42 of the throat or valley of the cap rests upon the top surface of rolled marginal portion 19 of cup 18 so that the cap is securely held in position on the container.

Cap 34 is also provided with a generally L-shaped fingerpiece 44 extending across the top of the valley of cap 34 and pivotally secured adjacent one end to the cap at 46. Detents 48, 48 are provided adjacent the

other end of fingerpiece 44 in position to engage with a portion of the wall of throat of cap 34 to limit the outward or upward movement of the fingerpiece, while the central portion of the fingerpiece rests upon the upper surface of button extension 32 so that when the fingerpiece is moved downwardly (FIG. 3) by finger pressure, the valve actuator, including tubular member 24, button 26, and button extension 32, is forced downwardly to open the valve and cause the spray to be dispensed from nozzle 30.

Dimensional variations in the depth of cup 18, as well as in the length of tube 24 the button 26 cause the position of fingerpiece 44 to vary considerably from one assembled container to another. However, by carrying assembly of the various parts up to the point shown in FIG. 1 before the cap is mounted in position, and by providing a valve actuator which (by virtue of button extension 32) is of greater length than necessary, then cutting off extension 32 at a precisely determined distance above the top surface of rolled marginal portion 19 of the cup on which the cap rests as shown in FIG. 4, the variation in the position of fingerpiece 44 is very much reduced. The cutting or severing operation may be performed by any conventional equipment such as a circular saw or knife 50 and by employing a conventional jig or gate (not shown) resting on the upper, outer marginal portion 19 of the cup 18 to determine the position of knife 50, thus determining very precisely the spacing or dimension identified as D in FIG. 4. When the cap is subsequently assembled in place as shown in FIGS. 2 and 3, the position at which fingerpiece 44 is supported by contact with extension 32 in the finished assembled product is independent of

any variations in the dimensions of the cup or of the valve actuator (before cutting) including tube 24 and button 26.

It will be appreciated that the cutting operation is readily controlled and may, if desired, be carried out on conventional equipment. Button extension 32 is not critical to the use of the process of the present invention; instead, the entire body of button 26 may be cut off at any desired level so that it will engage and support the fingerpiece of the assembled cap and container.

I claim:

1. In the process of assembling a valved pressurized aerosol container having an upwardly projecting valve-actuating member actuable by vertical movement mounted with said valve and member mounted on a cup secured to said container, the steps which comprises cutting off the upper portion of said member at a fixed spacing from a fixed upper portion of said container or from said cup, then mounting in fixed position in contact with the same fixed upper portion of said container or said upper an overcap including a fingerpiece movable with respect to the remainder of said overcap and engageable with said member to actuate said valve.

2. The process as claimed in claim 1 in which said fingerpiece is pivotally mounted on said overcap and is in contact with said member.

3. The process as claimed in claim 1 in which said valve is mounted on a cup secured to said container, said spacing is measured from the upper outer margin of the cup, and the overcap is mounted in contact with the upper outer margin of the cup. *

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,694,891

Dated October 3, 1972

Inventor(s) Edward J. Adams

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 33, "from" should be --form--;

Column 3, line 12, after "24", insert --and-- and delete "the";

Column 4, line 18, "comprises" should be --comprise--;

Column 4, line 22, delete "upper" and insert instead --cup--.

Signed and sealed this 13th day of February 1973.

(SEAL)

Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents