United States Patent [19]

Thomas

[11] **3,788,523**

[45] **Jan. 29, 1974**

[54] **OVERCAP SAFETY MECHANISM FOR AN AEROSOL CONTAINER**

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[73] Assignee: **American Home Products Corporation,** New York, N.Y.

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[21] Appl. No.: **327,376**

[52] **U.S. Cl.** **222/153,** 222/402.11

[51] **Int. Cl.** **B65d 83/14**

[58] **Field of Search** . 222/402.11, 182, 153, 402.13, 222/402.12, 394

[56] **References Cited**

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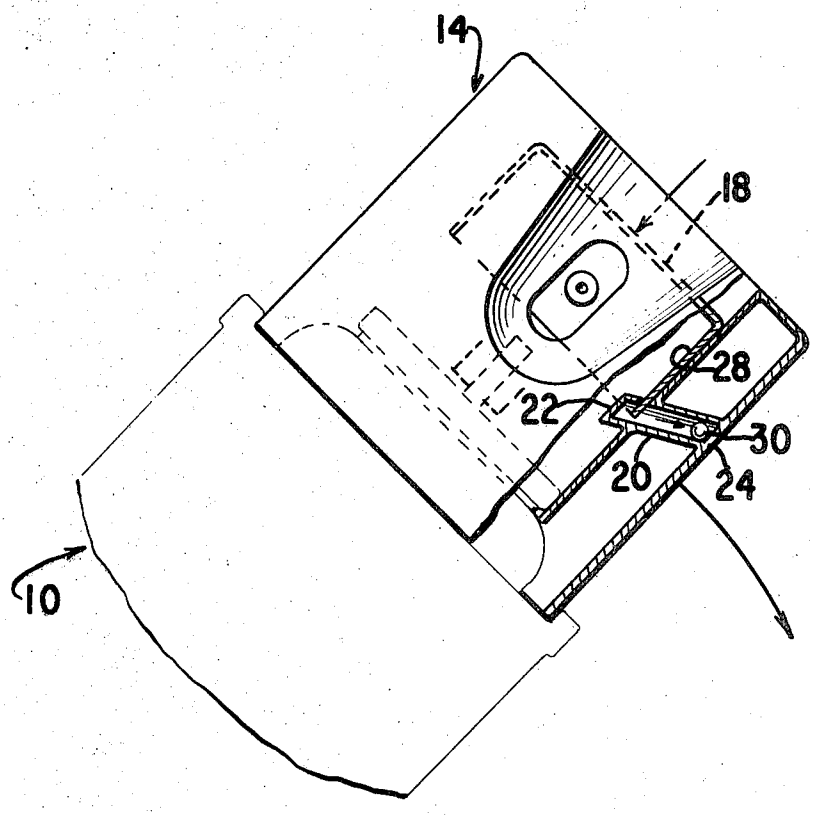
2,954,904	10/1960	Potoczky	222/402.12 X
3,419,187	12/1968	Bazarnic	222/153 X

Primary Examiner—Stanley H. Tollberg
Assistant Examiner—James M. Slattery

[57] **ABSTRACT**

A childproof, safety overcap for aerosol containers is disclosed which has a closed end slotted conduit connected to the fixed member so that the movable member must pass through the slot to actuate the valve. A ball is free to roll in the conduit and to move in or out of the slot depending on the position of the container. The position of the ball in the slot permits or prevents the actuation of the valve and discharge of the contents. In a normally vertical discharge position, discharge of the contents is prevented, but is accomplished by rotating the container to an inverted position to roll the ball out of the slot and simultaneously depressing the first movable member into the slot and then righting the container to permit the discharge of the contents from the vertical position.

5 Claims, 7 Drawing Figures



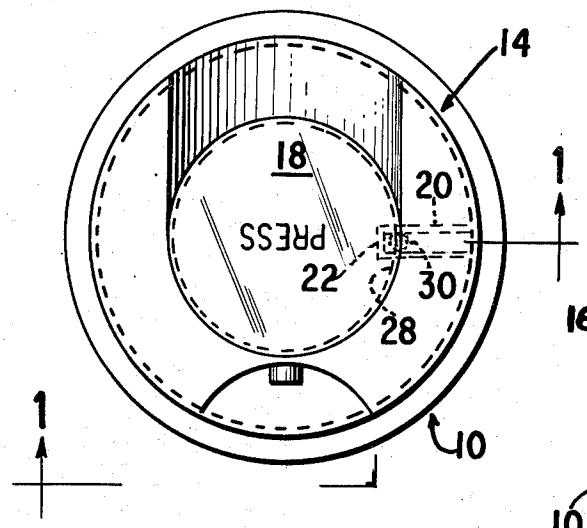


FIG. 2

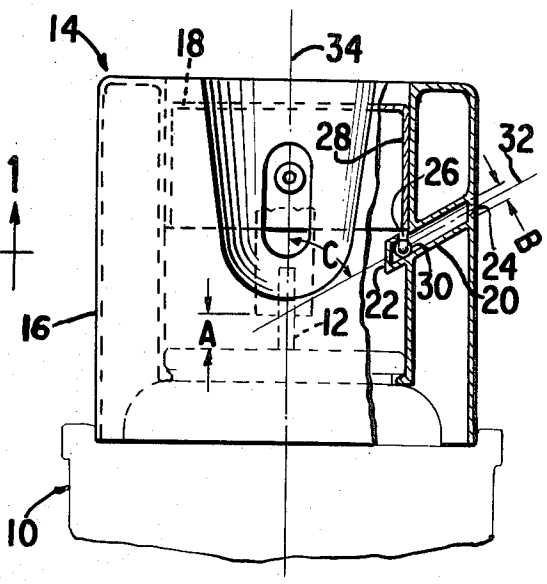


FIG. 1

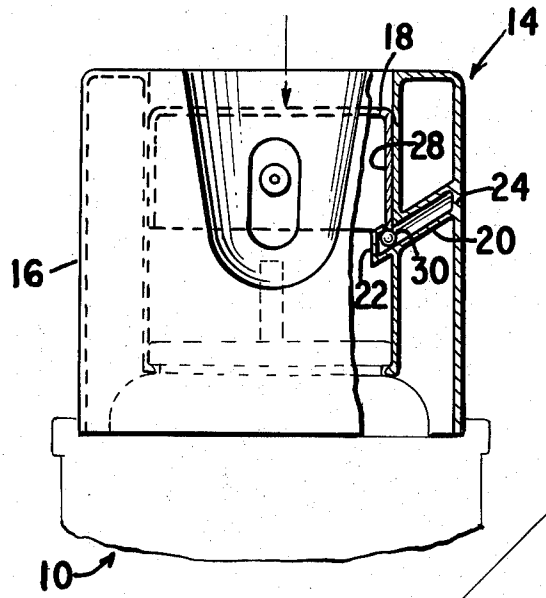


FIG. 3

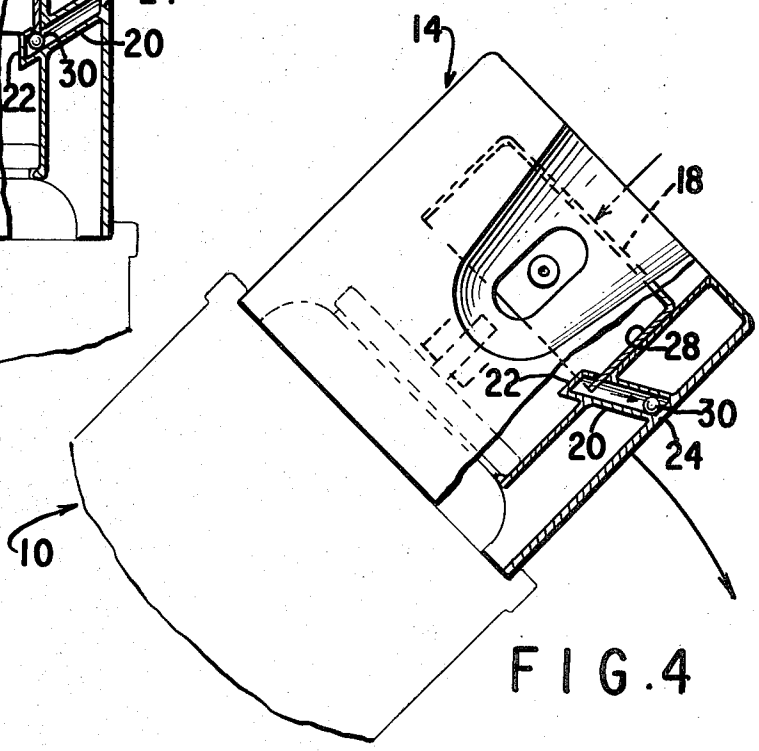


FIG. 4

FIG. 6

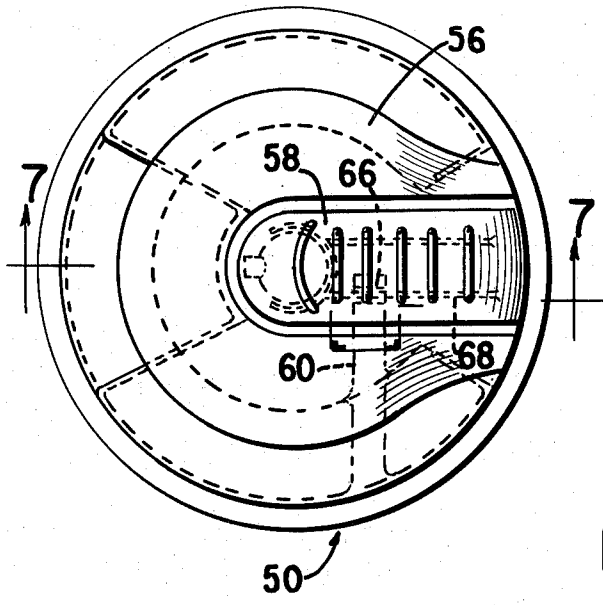


FIG. 7

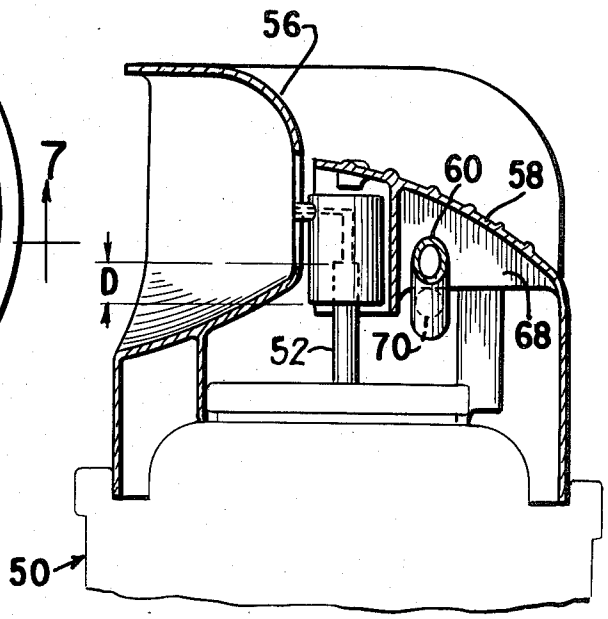
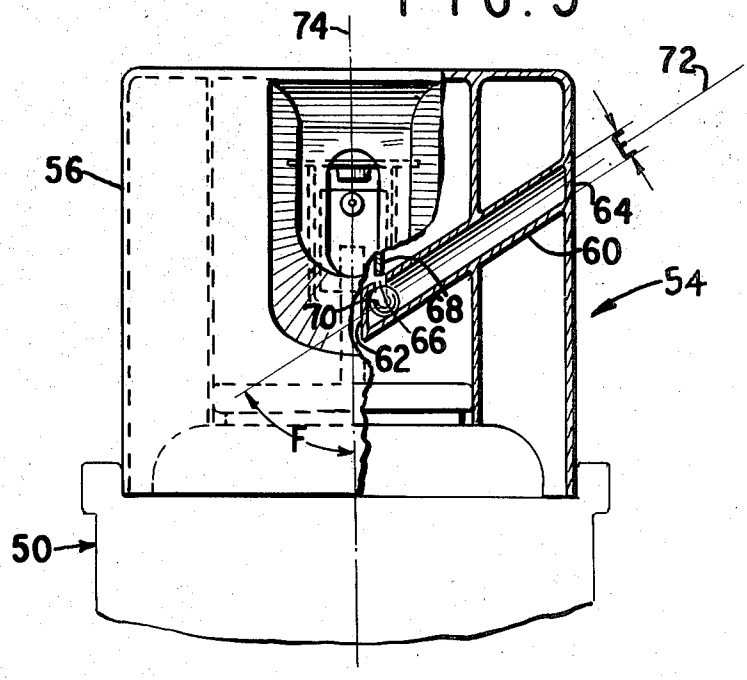


FIG. 5



OVERCAP SAFETY MECHANISM FOR AN AEROSOL CONTAINER

This invention relates to a safety overcap for an aerosol container. More particularly it relates to an overcap which prevents discharge of the contents when the container is in the vertical position. To discharge the contents the container must first be inverted and the actuating push button, or movable member, partially depressed, and then the container rotated to the upright position so that the contents, rather than the propellant, are discharged from the container.

It is recognized that the prehensile movement of children in the accident prone age of 24 to 48 months is not fully developed. The present invention requires the use of a well developed prehensile capability in order to discharge the contents of aerosol containers. Moreover, it requires three consecutive motions to discharge the contents, **1**, inversion of the container, **2**, partial depression of the push button, or movable member, and **3**, rotation of the container to an upright position.

As a further safety feature the overcap need never be removed from the container to actuate the valve mechanism.

Many aerosol containers require that the container be in an upright position in order to discharge the contents. If the container is in position substantially different from the upright only the propellant gas is discharged. While the invention will be described with regard to such containers, it will be apparent to those skilled in the art how the invention may be applied to aerosol containers designed for discharge from other positions. Variations of the invention are possible by simple rearrangement of the relation of the parts with regard to the discharge configuration of the aerosol container.

The closest known prior art is the following three United States patents. U.S. Pat. No. 2,643,799 issued June 30, 1953 to Countryman shows a valve actuation mechanism for a pressure dispenser which utilizes a ball to close the outlet port when the device is in the vertical position. The ball is held in place by a cap which must be removed to release the pressure on the ball which will be unseated by gravity when the container is moved out of a vertical position.

U.S. Pat. No. 2,954,904 issued Oct. 4, 1960 to Potoczky which utilizes a metal ball as part of a mechanical linkage to transmit an operative pressure from the top of the cap to the actuating valve to permit discharge of the contents. The ball is positioned for discharge when the container is in a position such that the ball is at its lowest kinetic energy level due to the force of gravity.

U.S. Pat. No. 3,186,605 issued June 1, 1965 to Potoczky utilizes a non-compressible sphere in the internal valve mechanism of a gas pressure type dispensing container as part of a mechanical linkage to actuate the valve to permit discharge of the contents when the container is in a position such that the sphere is at its lowest kinetic energy level due to the force of gravity, normally the vertical position. When the container is in other than the pre-determined position, the sphere engages a non-movable member and prevents the valve from being actuated or the contents discharged.

It is an object of this invention to provide a safety overcap for an aerosol container which need not be removed to dispense the contents of the container and thus the safety features are always operative and not dependent on the action of the user to return the overcap to the safety position.

It is another object of this invention to provide a childproof overcap for an aerosol container in which the valve dispensing mechanism is automatically locked after use.

It is a further object of this invention to provide a childproof overcap for an aerosol container which requires the succession of three motions in order to accomplish the discharge of the contents of the container.

Other and further objects of this invention will be apparent to those skilled in the art from a reading of the following description in conjunction with the drawings in which:

FIG. **1** is a partial elevational view, partly in section, taken from the discharge side showing the overcap of the present invention in position on an aerosol container;

FIG. **2** is a top plan view of the container in Fig. **1**;

FIG. **3** is a front elevational view partly cut away showing the blocking of discharge by the present invention;

FIG. **4** is a front elevational view of the container of FIG. **1** partly cut away showing the rotation of the container to permit discharge of the contents;

FIG. **5** is a partial elevational view, partly in section, showing the application of the present invention to a lever-type overcap in use on an aerosol container;

FIG. **6** is a top plan view of the embodiment of FIG. **5**; and

FIG. **7** is a sectional view taken generally along lines **7—7** of FIG. **6**.

A preferred embodiment utilizing a vertically reciprocable moving member is shown in FIGS. **1–4**. As is shown in FIGS. **1** and **2** the present invention is used in combination with an aerosol container **10**, which, as is well known in the art, is a metallic container having its contents pressurized by a propellant and dischargeable through a valve **12** which is normally biased to the closed position. More particularly the present invention resides in the overcap **14**. The overcap **14** has a non-movable member **16** which is fixably connected to the container **10** and a movable member **18** supported in and by the non-movable member **16**. The movable member **18** is adapted to engage the valve **12** and move it through a distance A to permit discharge of the contents.

The present improvement comprises a conduit **20** which is connected to the non-movable member **16**. The conduit **20** may be connected by well known means, such as by adhesives, or may be formed directly in the non-movable member. The conduit **20** has an internal dimension B which is preferably equivalent to the distance of travel A of the valve **12**. The conduit **20** is closed at both ends by walls **22** and **24**. A slot **26** is defined in the conduit **20** so as to intersect the path of wall portion **28** of movable member **18**. A non-compressible sphere **30** is disposed in the conduit **20** and when the container **10** is in the upright position the sphere **30** is interposed in the slot **26** and prevents the movement of the movable member **18** into the slot **26** by engaging the wall portion **28**.

The axis **32** of the conduit **20** intersects the axis **34** of the aerosol container **10** and its valve **12** at an angle C.

As may be seen in FIG. **3** when the movable member **18** is depressed while the container **10** is in the upright

position, the sphere **30** is interposed in the path of movement of the wall portion **28** so that the action of the valve is prevented and discharge of the contents is also prevented.

As may be seen in FIG. **4** when the container **10** is rotated to a position so that the end wall **24** of the conduit **20** is lower than end wall **22** of the conduit the sphere **30** rolls to the lower end of the conduit adjacent end wall **24.** The movable member **18** may be depressed and the wall portion **28** passes into the slot **26** so that the valve may be depressed. The contents are discharged by returning the container to the upright position while the valve is depressed.

An alternate embodiment utilizing a lever action moving member is shown in FIGS. **5–7.** As shown in FIGS. **5** and **6** the present invention is used in combination with an aerosol container **50** having its contents dischargeable through a valve **52** which is normally biased to the closed position. The overcap **54** is fixably connected to the container **50.** The overcap has a non-movable member **56** and a movable member **58** supported in and by the non-movable member **56.** The movable member **58** is adapted to engage the valve **52** and move it through a distance D to permit discharge of the contents.

The alternate embodiment comprises a conduit **60** which is connected to the non-movable member **56.** The conduit **60** may be connected to well known means, such as by adhesives, or may be formed directly in the non-movable member. The conduit **60** has an internal dimension E which is preferably equivalent to the distance of travel of the valve D. The conduit **60** is closed at both ends **62** and **64.** A slot **66** is defined in the conduit so as to intersect the path of wall portion **68** of movable member **58.** A non-compressible sphere **70** is disposed in the conduit **60** and when the container **50** is in the upright position the sphere **70** is interposed in the slot **66** and prevents the movement of the movable member **58** into the slot **66** by engaging the wall portion **68.**

The axis **72** of the conduit intersects the axis **74** of the aerosol container **50** and its valve **52** at an angle F.

As may be seen in FIG. **7** when the movable member **58** is depressed while the container **50** is in the upright position the sphere **70** is interposed in the path of movement of the wall portion **68** so that the action of the valve is prevented and discharge os the contents is also prevented.

What is claimed is:

1. An overcap for use in combination with an aerosol container having a valve biased to the closed position through which the contents are dispensed, comprising:

A. A first member fixably connected to the aerosol container adjacent the valve;

B. A second member movably connected to said first member and adapted to move the valve to the open position and having at least one wall defined in it;

C. A conduit closed at both ends connected to said first non-movable member at a predetermined angular relation to the direction of movement of the valve;

D. A slot defined in said conduit and located to intersect the path of travel of said wall of said second member;

E. A plug member movably disposed within said conduit and adapted to be moved by gravity into and out of said slot whereby when said plug member is interposed in said slot, said second member is prevented from entering said slot and actuation of the valve to discharge the contents is prevented and when said plug member is moved out of said slot said second member can enter said slot permitting actuation of the valve and discharge of the contents.

2. An overcap as defined in claim **1** in which said conduit is of a thickness equal to the distance of travel of said valve from the full closed to the full open position.

3. An overcap as defined in claim **1** in which the angle between the axis of movement of the valve and the axis of said cylinder is about 45 degrees.

4. An overcap as defined in claim **1** in which said plug member is a sphere.

5. In an overcap having a non-movable element and a movable element for actuating the release of contents from an aerosol container the improvement comprising:

A. A cylindrical tube closed at both ends,

1. Said tube being connected to the non-movable element and intersecting a first portion of the movable element during its movement;

2. A slot defined in said tube into which said movable portion must enter in order to release the contents of the aerosol container, and

B. A sphere disposed within said tube, said sphere being free to roll from one end to the other of said tube under the influence of gravity so as to fill said slot and prevent full movement of said movable element when said container is in an attitude in which discharge is to be restricted and to roll out of said slot and permit full movement of said movable element when said container is in a predetermined attitude.

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