

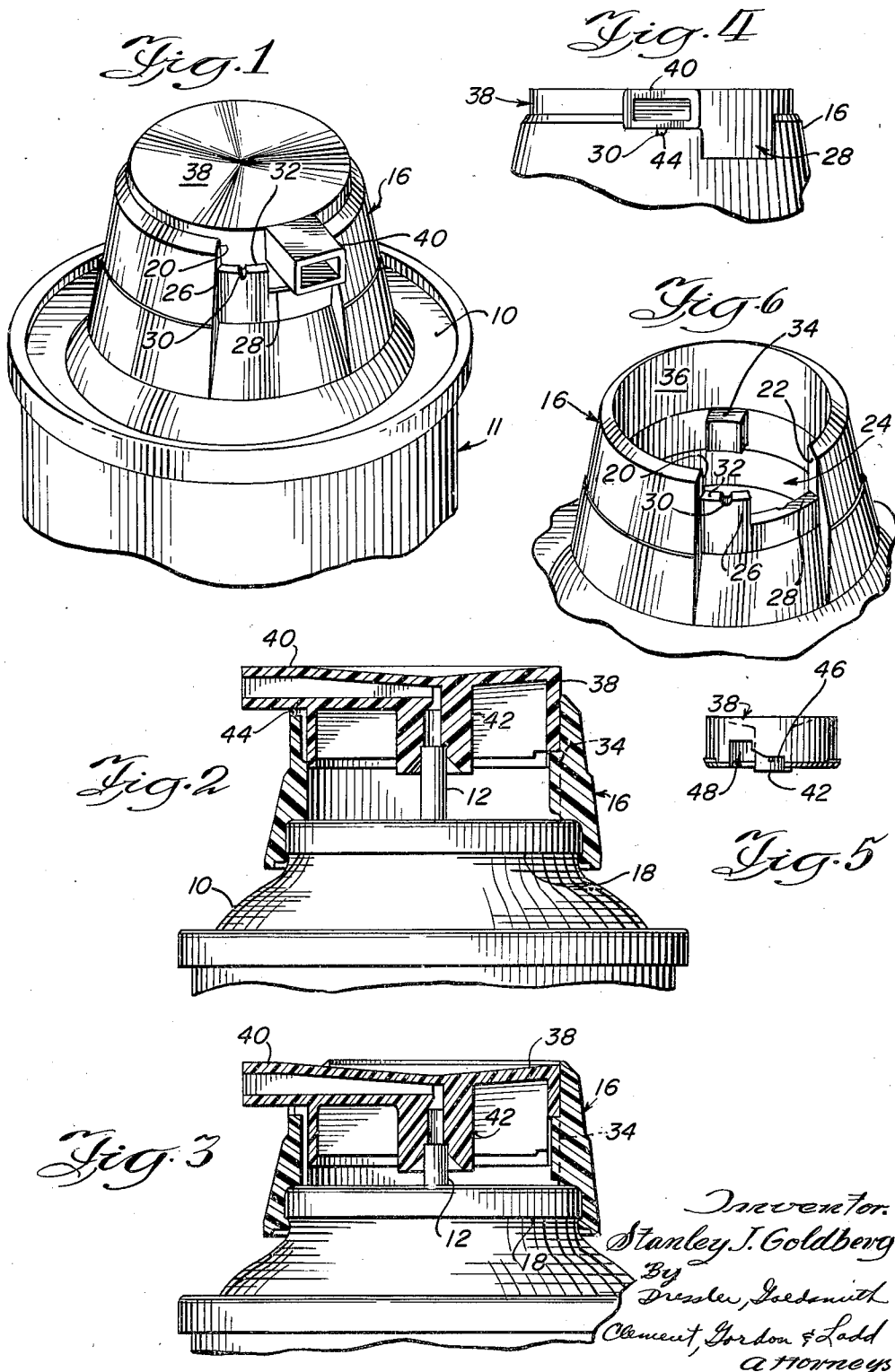
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ACTUATING MECHANISM

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ACTUATING MECHANISM

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This application relates to valve actuating mechanisms and more particularly to valve actuating cover assemblies for aerosol type containers.

The valves for aerosol cans, or other containers which dispense the product contained therein under pressure, are actuated by displacing in some way the valve stem extending upwardly from the top of the can. These valves include "push-down" valves, actuated by vertically depressing the valve stem, and "tilt-action" valves which can be operated by angular displacement of the valve stem. In aerosol or similar cans provided with such valves, the valve stem usually extends up from the top of the can. The stem is in some manner provided with a dispenser or actuator, either a spray button or some other actuating mechanism.

It is necessary, of course, to prevent premature or undesirable discharge of these cans by accidental opening of the valves through inadvertent activation of the valve stems. In order to guard against such actuation, some aerosol cans are provided with cuplike casings, known as overcaps, surrounding and detachable from the entire valve assembly to enclose the valve stem and attached dispenser. This type of protection, however, is not always possible or even desirable when a foam tip and actuator are utilized. Protection in these cases may be provided by covering the actuating member engaging the valve stem with an external cover. Since these protective devices are necessary primarily to allow for stacking of the cans on display shelves and during shipping, one approach to the problem is to design cans with their actuating members disposed in recessed relation to the side walls of a valve cover or support member in an attempt to afford the desired protection. It is quite clear, however, that this arrangement does not positively eliminate the possibility of accidental discharge.

It is desirable to positively eliminate possible accidental actuation while at the same time using an actuating mechanism that does not require the additional expense and inconvenience of supplemental covers or overcaps. The problems were solved in accordance with the present invention by a positive "locking" actuator which is a simple and inexpensive device. The locking arrangement, in addition to being of simple construction, prevents any movement of the actuating mechanism whether angular, pivotal or reciprocal, when in the locked position since any of these movements of an actuating assembly can activate a valve whether it be a push-down or a tilt-action type valve.

The device embodying the principles of the present invention, as illustrated in the accompanying drawings and described in detail hereinbelow, provides an assembly which can be positioned to lock the actuating mechanism in a stationary position thereby positively protecting against accidental actuation of the valve and discharge of the can. The assembly embodying the present invention is of simple construction, is easily manufacturable, is easily assembled and is able to provide the desired results within the strict economic limitations necessary for such a product to be successful within the industry.

In one embodiment of the present invention, a support member, mounted on the top of an aerosol can, is provided with a recess and with inwardly extending tab means in substantially diametrically opposed relation to the recess.

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A lid having a dispensing member positioned over the recess fits within the base member. The tab means and one portion of the recess cooperate with the lid and with the dispensing member, respectively, to prevent actuation of the valve when the lid is in a first position. The tab means and another portion of the recess cooperate with a slot in the periphery of the lid and with the dispensing member, respectively, to allow movement of the lid and actuation of the valve thereby when the lid is in a second position.

More specifically, one disclosed device incorporating the present invention includes an annular support member fastened to the rim of the valve assembly surrounding the valve stem. A recess having two adjacent steps of different heights is formed in the side of the support member. At least one tab is formed at a point on the inner surface of the support member substantially diametrically opposed to the recess.

A cover actuator provided with a dispensing member is located within the annular space of the support member. The dispensing member, which may be, for example, a spray nozzle or foam spout, extends over the recess portion of the support member. When the actuator is in a first position, a bead on the under surface of the dispensing member engages a groove in the top surface of the upper step of the recess while simultaneously the rim of the actuator engages the tab. In this position, in which the lid engages the above portions of the support member, the lid cannot be depressed, tilted or otherwise displaced in a manner to actuate the valve. The bead and groove cooperate to form a detent to "lock" the lid against accidental displacement from this position.

The actuator-lid can be rotated into a second position wherein the dispensing member is aligned with the lower of the two steps in the recess. In this position, the tab on the support member is vertically aligned with a slot in the rim of the lid. The relationship between the spout and the lower step, and between the tab and slot allows movement of the actuator to displace or tilt the valve stem thereby opening the valve and allowing for discharge of the contents maintained under pressure within the can.

In addition to the foregoing, numerous other advantages and features of the present invention will become readily apparent from the following detailed description of the invention and one embodiment thereof, from the claims and from the accompanying drawings in which each and every detail shown is fully and completely disclosed as a part of this specification, in which the reference numerals refer to like parts and in which:

FIGURE 1 is a perspective front view of the actuator cover assembly shown mounted on the top of an aerosol can;

FIGURE 2 is a perspective view of the support member shown without the lid in place;

FIGURE 3 is a sectional view of the assembly of FIGURE 1 taken along the lines 3—3 showing the assembly in actuated position;

FIGURE 4 is a sectional view of the assembly of FIGURE 1 taken along the lines similar to FIGURE 3 but showing the assembly in locked position;

FIGURE 5 is a front elevational view showing the assembly in locked position; and

FIGURE 6 is a rear elevational view of the lid showing a slot located in the rim thereof.

Referring more specifically to the drawings, there is shown one embodiment of the present invention wherein the upper portion 10 of an aerosol can 11 is provided with a valve having a valve stem 12 extending through its upper surface. The valve, when actuated, allows the contents of the can 11 to be dispensed under pressure.

The actuating-cover assembly includes a substantially annular support member 16 fitted to the rim 18 of the

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valve assembly surrounding the upwardly extending valve stem 12. Two guide walls 20, 22 in support 16 define a bi-level recess 24 provided with an upper step 26 and a lower step 28. A radial groove 30 is formed in the top surface 32 of the upper step 26.

At least one tab 34 is provided on the inner surface 56 of the support member 16. The tab or tabs 34 are evenly spaced in relation to the recess 24 to define a stop acting uniformly on a lid 38 rotatably and depressibly disposed within the support member 16. If, as shown, only one tab 34 is provided, it is substantially diametrically opposed from the upper step 26.

The lid 38 is provided with a horizontal, outwardly extending spout 40 passing through the recess 24 above the steps 26, 28. An actuating member 42 extends down from the center of the lid 38 to engage the valve stem 12. Rotational movement of the lid 38 is limited by confinement of the spout 40 between the guide walls 20, 22 of the support member 16.

The bottom surface of the spout 40 is provided with a radially extending bead 44 which, when the spout is positioned adjacent wall 20 a top the upper step 26, engages the groove 30 in the top surface 32 of the upper step 26 to deter rotational movement of the lid 38. When the lid 38 is in this position, the tab 34 engages the peripheral rim 46 of the lid 38. The cooperative engagement between the upper step 26 and spout 40, and between the peripheral rim 46 and tab 34 prevents actuation of the valve by either depression or angular displacement of the lid 38.

When the lid 38 is rotated so that the spout 40 is in vertical alignment with the lower step 26, a slot 48 in the lid 38 is positioned to coact with the tab 34. As a result, the lid 38 can be depressed, tilted, or otherwise actuated to operate the valve stem 12 and discharged the contents contained within the container.

Thus, there has been disclosed a new and improved actuator-lid assembly capable of providing positive locking action against accidental actuation of the aerosol valve. In accordance with the present invention, this positive protection is provided by the elements of the actuating-cover mechanism itself without complicated modifications or expensive additions. As a result, the use of additional protective lids or similar devices is no longer necessary in order to insure against undesirable discharge of pressure cans as a result of accidental actuation of valves associated therewith.

It will be readily observed from the foregoing detailed description of the invention and in the illustrated embodiment thereof that numerous variations and modifications may be effected without departing from the true spirit and scope of the novel concepts and principles of this invention.

What is claimed is:

1. An aerosol valve actuating-cover assembly comprising a support member having guide means defining a bi-level recess, a lid movably mounted relative to said support member and provided with a valve actuator, said lid including a dispensing member extending outwardly therefrom between said guide means, one level of said recess defining stop means for preventing downward movement of said lid when said dispensing member is adjacent a first side of said guide means, another level of said recess defining means for allowing actuating movement of said lid when said dispensing member is adjacent another side of said guide means, and tab means on said support member defining another stop means cooperating with said lid for preventing tilting of said actuator when said spout is adjacent said first side of said guide means.

2. A valve actuating-cover assembly comprising a hollow support member for mounting on an aerosol container, said support member having guide means defining a bi-level recess and also having inwardly extending tab means spaced from said recess, a lid rotatably and depressibly mounted within said support member, said lid having

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a spout extending outwardly over said bi-level recess between said guide means, said tab means and one level of said bi-level recess defining stop means engaging said lid and said spout, respectively, for preventing actuating movement of said lid when said spout is in a first position adjacent one side of said guide means, said tab means and the other level of said recess defining means cooperating with said lid and said spout for allowing actuating movement of said lid when said spout is in a second position adjacent the other side of said guide means.

3. An aerosol valve cover and actuating assembly comprising an annular support member having a bi-level recess of stepped configuration and being provided with horizontally extending tab means spaced from said recess, a lid rotatably disposed within said support member, said lid being provided with a spout extending outwardly therefrom across said recess, one step of said recess and said tab means defining stop means engaging said spout and the peripheral rim of said lid, respectively, for preventing actuating movement of said lid when said spout is vertically aligned with said one step, the other step and said tab means cooperating with said spout and with slot means in said peripheral rim for allowing actuating movement of said lid when said spout is vertically aligned with said other step.

4. A valve actuating-cover assembly comprising an annular support member for mounting on an aerosol container, said support member having vertical guide walls defining a recess provided with two ledges of different heights, a groove formed in the top surface of the upper of said ledges, a horizontal tab integral with said support and extending inwardly from a point substantially diametrically opposed to said recess, a lid rotatably and depressibly mounted within said support member, said lid having an outwardly extending spout provided with a bead along its lower surface and extending over said ledges between said guide walls, said lid having a peripheral rim interrupted by an upwardly extending slot, said lid occupying a first rotational position wherein said tab and said upper ledge define stop means engaging said peripheral rim and said spout, respectively, for preventing reciprocal and tilting valve actuating movement of said lid and wherein said groove and bead are engaged to define catch means for impeding rotational movement of said lid, and said lid occupying a second rotational position wherein said tab means and the lower ledge coact with said slot and said spout, respectively, for allowing actuation of the valve by said lid.

5. An aerosol valve cover and actuating assembly comprising a hollow support member, a bi-level recess formed in said support member, tab means formed on said support member, a lid movably mounted relative to said support member having a dispensing member extending outwardly therefrom, a groove located in one level of said recess, a bead formed on said dispensing member engaging said groove to restrain said lid in a first position adjacent one side of said recess, said one level and said tab means defining stop means for preventing valve actuating movement of said lid when in said first position.

6. An aerosol valve cover and actuating assembly comprising a hollow support member for mounting on an aerosol container, a bi-level recess formed in said support member and partially defined by guide means, said support member being provided with groove means adjacent said recess, tab means formed on said support member at a point substantially opposed to said recess, a lid movably mounted relative to said support member having a dispensing member extending over said recess between said guide means, means associated with said dispensing member and cooperating with said guide means for limiting movement of said lid, bead means provided adjacent said dispensing member engaging said groove means for impeding movement of said lid, said tab means and a portion of said recess defining stop means engaging the rim of

said lid and said dispensing member for preventing actuating movement of said lid when in one position relative to said support member, said stop means cooperating with said dispensing member and the slot in said rim for allowing actuating movement of said lid when in another position relative to said support member.

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