United States Patent

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[54] **AEROSOL DISPENSER VALVE**
6 Claims, 3 Drawing Figs.

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[50] Field of Search 222/402.1, 402.21, 402.22, 402.24, 402.25, 513, 514, 518, 511; 251/354

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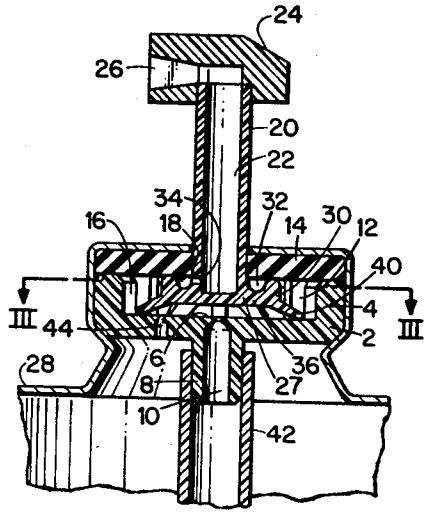
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ABSTRACT: An aerosol dispenser valve including a spring-biased valve member having a spring-biasing means integral therewith.



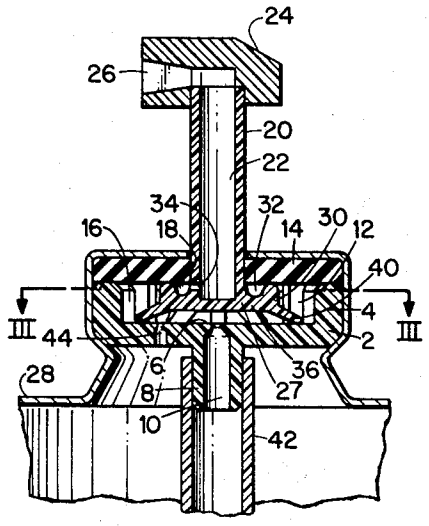


Fig. 1.

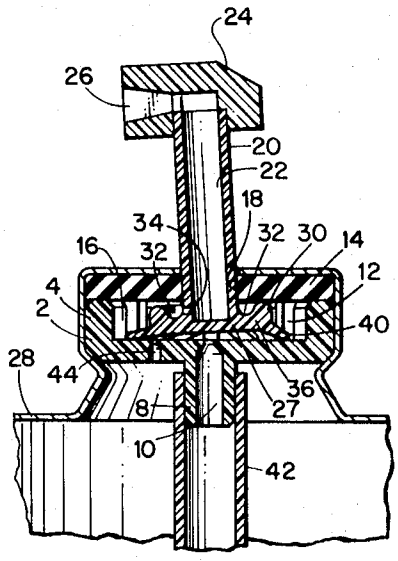


Fig. 2.

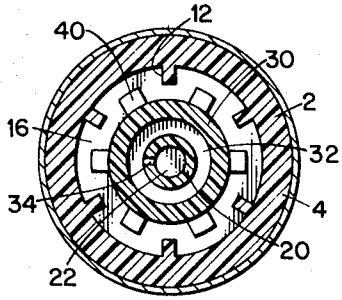


Fig. 3.

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AEROSOL DISPENSER VALVE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to aerosol dispenser valves and is directed more particularly to an aerosol dispenser valve having a spring-biasing member.

2. Description of the Prior Art

Aerosol dispenser valves presently in use generally include at least one valve member which is spring biased in such a manner as to close the valve. In order to open the valve, an operator moves the valve member against the spring pressure.

Generally, the spring pressure is supplied by a metal wire coil spring included in the valve assembly. The use of the coil spring is objectionable from a valve manufacturing standpoint because of the cost involved in the handling of the spring prior to and during the valve assembling stage and the need for accurately placing the spring in the valve assembly. Further, it has been found that the metal coil spring is at times deleteriously affected by the material contained in the dispenser; and at times the contained material is adversely affected by contact with the metal spring.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a valve assembly including a spring-biased valve member, but eliminating the requirement for a wire coil spring.

A further object of the invention is to provide an aerosol valve having a spring-biased member with the spring-biasing means being an integral part of the member, thereby eliminating spring handling and alignment problems.

A still further object of the invention is to provide such a valve in which the spring means is of a material generally not adversely affected by substances which tend to adversely affect metal, and which will not adversely affect contents exposed to the spring means.

With the above and other objects in view, as will hereinafter appear, a feature of the present invention is the provision of an aerosol valve assembly comprising a valve member movable between first and second positions, and leaf spring means integral with said valve member and operable to urge said valve member into said first position whereby to prevent flow of material through said valve. The spring means is yieldable to permit movement of the valve member to the second position whereby to permit flow of material through said valve.

The above and other features of the invention, including various novel details of construction and combination of parts, will now be more particularly described with reference to the accompanying drawings and pointed out in the claims. It will be understood that the particular device embodying the invention is shown by way of illustration only and not as a limitation of the invention. The principles and features of this invention may be employed in various and numerous embodiments without departing from the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference is made to the accompanying drawings in which there is shown an illustrative embodiment of the invention from which its novel features and advantages will be apparent.

FIG. 1 is an elevational sectional view of one form of aerosol valve illustrative of an embodiment of the invention, the valve being shown in the closed position;

FIG. 2 is similar to FIG. 1 but shows the valve in an open position; and

FIG. 3 is a sectional view taken along line III—III of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, it will be seen that the illustrative valve includes a housing 2 having an annular wall 4 defining a recess 6, and a nozzle 8 having an inlet passage 10. Integral with the annular wall are inwardly directed radial extensions or ribs 12 (see FIG. 3). A sealing member 14 is disposed upon the free edge of the annular wall 4 to cover the recess 6 and thereby to form a substantially closed chamber 16.

The sealing member 14 has a centrally disposed opening 18 which receives an actuating stem 20 having a discharge passage 22. A first end of the stem 20 is provided with an actuating button 24 having a discharge orifice 26 in communication with the discharge passage 22. A second end of the stem 20 comprises a valve member 27 disposed in the chamber 16.

Still referring to FIG. 1, the sealing member 14 and the housing 2 may be clamped together by a cover means 28 which may comprise simply the configuration of a container in which is disposed a material under pressure to be dispensed by the present valve assembly.

The valve member 27 includes an annular wall 30 circumscribing an annular groove 32. The free edge of the annular wall 30 is normally in engagement with the sealing member 14, thereby interrupting communication between the groove 32 and the chamber 16. An orifice 34 interconnects the groove 32 and the discharge passage 22 (FIG. 3).

The annular wall 30 is integral with a plate portion 36 of the valve member 27. The plate portion is in turn integral with the stem 20 and closes the second end of the stem. Integral with the plate portion 36 of the member 27 and extending radially therefrom, and at an angle so as to extend partly axially therefrom in a direction away from the stem, are a series of fingers 40 which bear upon the housing 2.

The valve member 27 is of a plastic composition so that the fingers 40 are of a resilient material and act as leaf springs, urging the annular wall 30 into engagement with the sealing member 14. The resiliency of the fingers 40, however, permits their deflection, as by tilting or depressing the stem by pressure exerted upon the button 24.

Referring to FIG. 2, it will be seen that, in operation, pressure exerted upon the button 24 acts upon the valve member 27 to displace the free edge of the annular wall 30 from a first position adjacent the sealing member 14 to a second position removed therefrom, to place the groove 32 in communication with the chamber 16. The chamber is in communication with the interior of the container by way of the inlet passage 10, so that such movement of the wall 30 relative to the sealing member 14 opens a passageway extending from the interior of the container, through the orifice 34, and the discharge passage 22 to the discharge orifice 26, whereby to dispense the contents of the container. The rib means 12 serve to prevent the sealing member 14 from "following" the annular wall 30 when the wall is forced away from the sealing member.

When pressure on the button 24 is released, the spring fingers 40 act upon the valve member 27 to return the valve member to the first position and thereby to urge the wall 30 back into engagement with the sealing member 14, to terminate flow through the valve.

A tube 42 may be attached to the inlet nozzle 8 to facilitate removal of contents from the container. The housing 2 may be provided with a vapor aperture 44 to admit more propellant gas to the chamber 16, to provide a finer, drier dispersion of contents.

It is to be understood that the present invention is by no means limited to the particular construction herein disclosed and/or shown in the drawings, but also comprises any modifications or equivalents within the scope of the disclosure.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. Aerosol valve assembly comprising a housing and sealing member forming a chamber, a valve member independent of said chamber and disposed in said chamber, an actuating stem unitary with said valve member and extending through an opening in said sealing member outwardly from said assembly, and a plurality of fingers unitary with said valve member and extending radially outwardly from said valve member toward an annular wall of said housing but removed from said annular wall, said fingers further being inclined axially toward a plate portion of said housing and slidably bearing against said plate portion to urge said valve member into engagement with said

sealing member, said fingers being yieldable to permit removal of said valve member from said sealing means upon application of pressure upon said stem but operation upon release of said pressure to urge said valve member back into engagement with said sealing member.

2. The invention according to claim 1 in which the free ends of said fingers are slidable upon the chamber surface of said plate portion.

3. Aerosol valve assembly comprising a housing including a plate portion bounded by peripheral annular wall upstanding from only one side thereof, a sealing member disposed adjacent an edge of said annular wall to form a chamber, cover means holding said sealing member in abutting relationship with said annular wall, a nozzle extending outwardly from said plate portion and having an inlet passage in communication with said chamber, said sealing member having an opening therein, an actuating stem disposed in said opening and having a first end extending into said chamber and having a second end extending outwardly beyond said cover, said actuating stem having a discharge passage in communication with the atmosphere, a valve member disposed on and closing the first end of said stem and movably disposed in said chamber, said valve member having an annular recess about said stem formed by a second annular wall upstanding from said valve member and engageable with said sealing member to interrupt communication between said annular recess and said chamber, said stem having an orifice placing said annular groove in communication with said discharge passage, and leaf spring means being a unitary part of said valve member and extending radially therefrom and inclined axially therefrom in a direction toward said plate portion, said spring means bearing against the chamber surface of said plate portion to urge said second annular wall into engagement with said sealing member, said spring means being slidably yieldable upon application of pressure on said stem to permit said second annular wall means to be removed from said sealing member to establish communication between said chamber and said discharge passage and acting upon release of said pressure to urge said second annular wall back into engagement with said sealing member.

4. The invention according to claim 3 in which said leaf spring means comprise a plurality of fingers extending radially outwardly beyond said second annular wall but short of said housing annular wall.

5. The invention according to claim 3 in which said leaf spring means comprise a plurality of fingers unitary at their bases with said valve member and otherwise unattached to each other.

6. The invention according to claim 5 in which the free ends of said fingers are slidable upon said chamber surface of said plate portion.

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