United States Patent

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[54] **AEROSOL VALVE**
7 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **222/402.22**
[51] **Int. Cl.** **B65d 83/14**
[50] **Field of Search** 222/402.22, 402.18, 145, 402.21, 402.24, 402.23

[56] **References Cited**

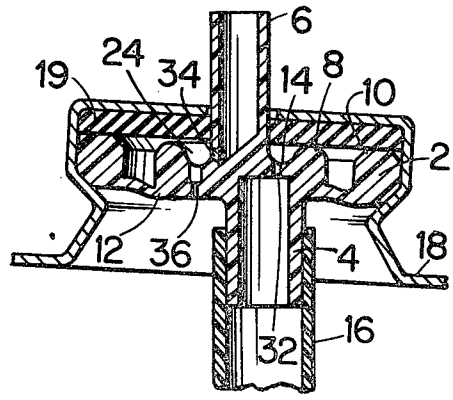
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Primary Examiner—Robert B. Reeves
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ABSTRACT: An aerosol dispenser valve comprising a single valve member having inlet means, outlet means, first chamber means in communication with the inlet means, second chamber means in communication with the outlet means, and means for separating the first and second chamber means, the separating means being biased in separating position, he valve member being movable to remove the separating means from separating position, whereby to permit flow of material through the valve.



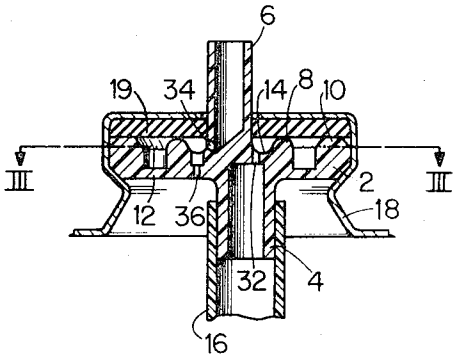


Fig. 1.

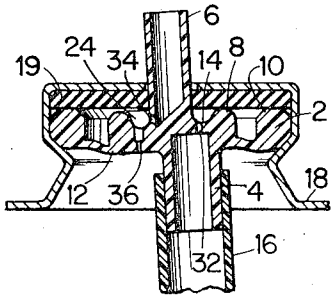


Fig. 2.

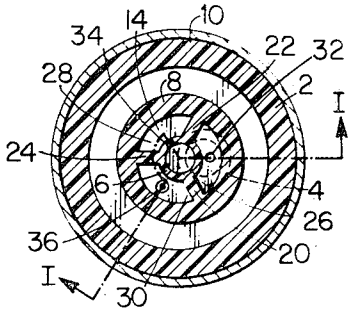


Fig. 3.

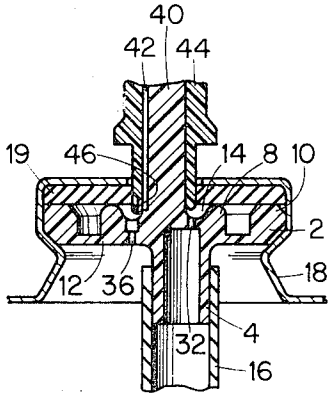


Fig. 4.

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AEROSOL VALVE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to valves and is directed more particularly to an aerosol dispenser valve.

2. Description of the Prior Art

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

The various valve members are manufactured separately and subsequently fitted together in a valve assembly operation. Generally, the spring pressure required in operation of the valve is supplied by a metal wire coil spring included in the valve assembly. Accurate assembly of the various components is necessary and is costly in view of the time and labor involved; further, the handling of the various components prior to assembly presents problems further increasing the overall cost of the valve. Still further, it has been found that the metal coil spring is at times deleteriously affected by the material contained in the dispenser and on still other occasions the material contained is adversely affected by contact with metal.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a valve assembly including a single valve member, thereby eliminating the requirement for accurately connecting together of multiple-valve components.

A further object of the invention is to provide such a valve assembly in which the single valve member is biased, but eliminating the requirement for a wire coil spring.

A still further object of the invention is to provide such a valve in which the biasing means is of a material generally not adversely affected by substances which tend to adversely affect metal and generally not deleterious to materials flowing through the valve.

Still another object of the invention is to provide a valve which is relatively noncomplex in structure and easily and inexpensively manufactured.

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 including a unitary valve member having an inlet passage, an outlet passage, a first chamber in communication with the inlet passage, a second chamber in communication with the outlet passage, and a separating means for separating the first and second chamber biased in separating position, thereby obstructing flow-throug the valve. The valve member is movable to remove the separating means from an obstructing position whereby to permit flow from the inlet passage to the outlet passage.

The above and other features of the invention, including various novel details of construction and combinations 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 valve assembly 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 valve assembly illustrative of an embodiment of the invention, taken along lone I—I of FIG. 3;

FIG. 2 is an elevational sectional view, similar to FIG. 1, but showing the illustrative valve in a flow-through condition;

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

FIG. 4 is an elevational sectional view similar to FIG. 1, but showing an alternative form of valve assembly illustrative of the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to FIG. 1, it will be seen that the illustrative valve assembly includes a valve member 2 having integral therewith an inlet tube 4 and an outlet tube 6. The valve member 2 is so configured as to have concentric walls 8, 10 upstanding from a generally planar portion 12 of the valve member. The inner concentric wall 8 bounds an annular groove 14 disposed about the outlet tube 6. A dip tube 16 may be attached to the inlet tube 4 and extends to a position proximate to the bottom (not shown) of a container 18 in which the valve is disposed.

A sealing member 19 is disposed adjacent the valve member 2 and may be clamped thereto by a pinching configuration of the envelope body of the container 18. The walls 8, 10 engage the sealing means 19 which is fitted adjacent the outlet tube 6.

Referring to FIG. 3, it will be seen that radial walls 20, 22, 24 extend outwardly from the outlet tube 6 to the annular wall 8 to divide the annular groove 14 into three chambers 26, 28, and 30. The radial walls engage the sealing member 19 to prevent flow of material from one chamber to another. An orifice 32 places the chamber 26 in communication with the inlet tube 4. In like manner, an orifice 34 places the chamber 28 in communication with the outlet tube 6, the radial wall 22 separating the chambers 26, 28, whereby to obstruct communication between the inlet 4 and the outlet 6.

It is desirable in the use of some aerosol products that propellant gas be mixed with the contained material immediately prior to discharge. In such instance, there may be provided a vapor tap orifice 36 interconnecting the upper portion of the interior of the container 18 and the chamber 30. Thus, gaseous propellant is permitted to enter the chamber 30, but prevented from further flow by engagement of the walls 20, 24, and 8 with the sealing means 19.

In order to operate the valve, the outlet tube 6 is tilted, as by a finger of an operator (not shown). Referring to FIG. 2, it will be seen that the planar portion 12 of the valve member 2 is resilient and "gives way," or deforms, under the tilting pressure exerted on the outlet tube 6. As the planar portion 12 deforms, the annular wall 8 disengages from the sealing member 19 and the radial walls 20, 22, 24 remove from the sealing member to permit flow from the inlet tube 4 to the outlet tube 6. The flow of material through the valve is joined by propellant entering through the vapor tap orifice 36.

When pressure on the outlet tube 6 is released, the planar portion 12 of the valve member 2 acts as a spring means and urges the annular wall 8, as well as the radial walls, back into engagement with the sealing means 19, thereby interrupting flow between the various chambers and terminating flow through the valve.

Referring to FIG. 4, it will be seen that in lieu of the outlet tube 6 there may be provided a stem 40 having an outlet passage 42. The stem 40 receives an actuator button 44 which may be depressed by an operator to cause movement of the valve member away from the sealing member to effect operation of the valve substantially as described above. The actuator button 44 may include a recess 46 for interconnecting the outlet passage 42 and one of the chambers.

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 dispenser valve comprising a unitary valve member having inlet means and outlet means, an annular wall forming an annular groove about said outlet means, scaling means engageable by said annular wall to enclose said annular

groove, radial walls extending outwardly from said outlet means to said annular wall and traversing said annular groove and engageable with said sealing means to divide said annular groove into a plurality of chambers, a first orifice in a first of said chambers for interconnecting said inlet means with said first chamber, a second orifice in a second of said chambers for interconnecting said outlet means and said second chamber, and resilient spring means comprising a generally planar portion of said valve member for yieldingly urging said annular wall and said radial walls into engagement with said sealing means.

2. The invention according to claim 1 including a third orifice in a third of said chambers for interconnecting the third chamber and a source of propellant gas disposed in a container to which the valve is fixed.

3. Aerosol dispenser valve comprising a unitary valve member having inlet means, outlet means, a first chamber in communication with said inlet means, a second chamber in communication with said outlet means, said first and second chambers comprising portions of an annular groove, radial wall means traversing said groove and separating said first and second chambers, and sealing means engageable with said radial wall means, said member being movable to remove the radial wall means from engagement with the sealing means, whereby to open communication between said first and second chambers.

4. The invention according to claim 3, in which said radial wall means is urged into engagement with said sealing means by a spring means.

5. The invention according to claim 4, in which said spring means comprises a leaf spring means formed as an integral part of said unitary valve member.

6. Aerosol dispenser valve comprising a valve member having a generally planar portion, a first generally circular wall upstanding from the periphery of said planar portion, a second generally circular wall upstanding from said planar portion and disposed within said first circular wall, a stem upstanding from said valve member and disposed centrally of said second wall, said stem having a discharge passage therein, an inlet tube depending from said valve member and having an inlet passage therein, said stem and said second wall forming an annular groove therebetween, radial wall means extending from said stem to said second circular wall and traversing said groove to divide said groove into a plurality of chambers including first and second chambers, said first chamber having an orifice interconnecting said first chamber and said inlet passage, said second chamber having an orifice interconnecting said second chamber and said discharge passage, and sealing means connected to said first circular wall and engageable by said second circular wall and said radial wall means, said planar portion being deformable to permit removal of said second circular wall and said radial wall means from said sealing means whereby to open communication between said first and second chambers, but urging said second circular wall and said radial wall means into engagement with said sealing means whereby to interrupt communication between said first and second chambers.

7. The invention according to claim 6, in which said plurality of chambers further comprises a third chamber, said third chamber having an orifice for interconnecting said third chamber and a reservoir of propellant gas.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,633,798 Dated January 11, 1972

Inventor(s) Milo E. Webster

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

On the cover sheet, in the ABSTRACT, line 6, "he" should read -- the --. Column 1, line 51, "flow-throug" should read -- flow through --; line 73, "along lone 1-1" should read -- along line 1-1 --. Column 2, line 74, "scaling" should read -- sealing --.

Signed and sealed this 24th day of October 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.