

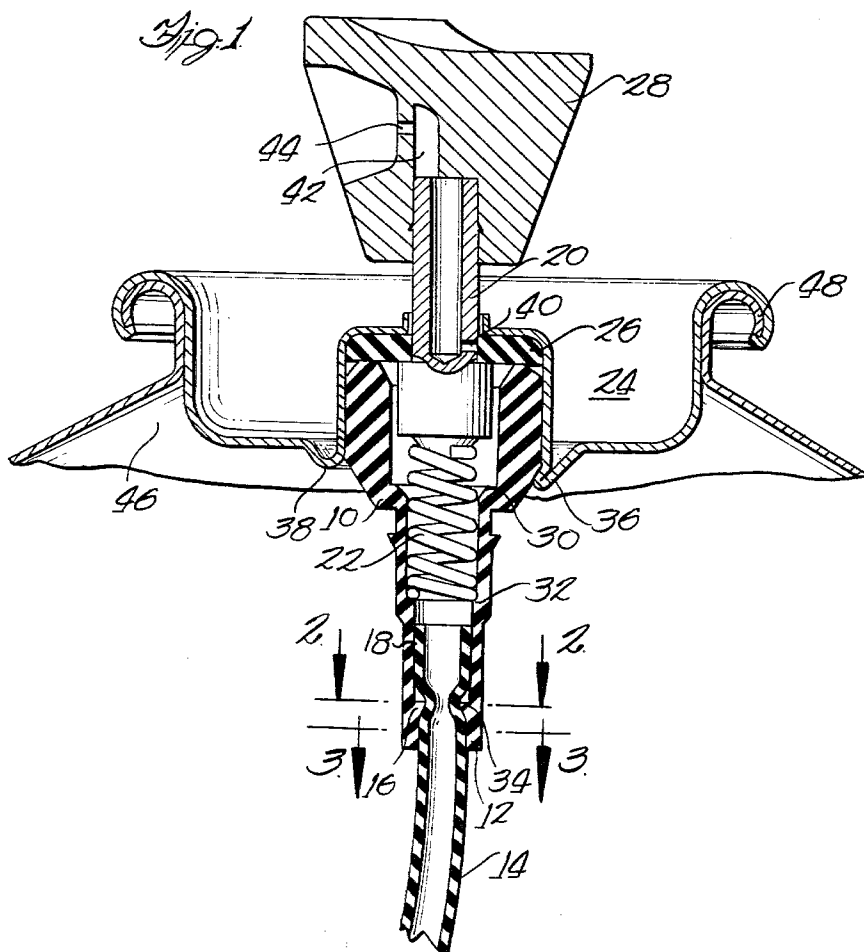
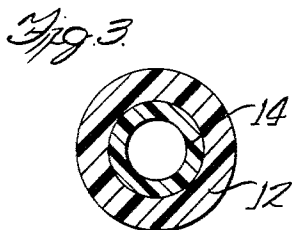
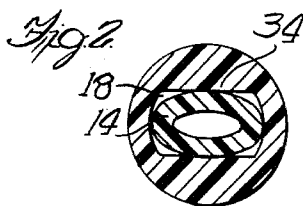
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AEROSOL VALVE WITH SECURE ATTACHING MEANS FOR DIP TUBE

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AEROSOL VALVE WITH SECURE ATTACHING MEANS FOR DIP TUBE

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1 Claim. (Cl. 222—394)

This invention relates to an aerosol valve and more particularly to an aerosol valve especially useful for utilizing a capillary dip tube.

Aerosol containers have become quite popular in the merchandizing of liquid and powdered products because of their convenience of use. Such containers usually have a convex bottom for structural strength against the internal pressure of the propellant. This bottom also serves to channel the terminal portion of the contents to the periphery of the can bottom where the bottom open end of the dip tube is usually located. It should be evident that this provides for better emptying of the can as the contents are depleted.

In most structures the valve body has a dip tube attachment tail around which the dip tube is force fitted. The dip tube is of extra length so that it is bowed between the tail and the outer peripheral bottom of the can.

In dispensing the terminal portions of the contents of the can, it is desirable to hold the can so that the bottom end of the dip tube extends to the lowermost position of the can. To accomplish this, the trade has customarily provided a mark on the dispensing head or the valve housing to indicate the direction of bow of the tubing; thus the user is aware of the most optimum position for complete emptying of the can.

Recently, capillary tubing as dip tube material has come into existence because of the desirability of dispensing controlled minute amounts of the contents of the can. Pharmaceuticals, perfumes, food flavoring and the like are typical examples where only a minute quantity of the contents need be expelled.

It has also become customary to pressure fill certain cans especially where the contents must be continually enclosed within a sealed vessel. Such pressure filling is done after the valve has been mounted and sealed to usual crown top of the can.

During such pressure filling, the tubing frequently blows out or turns. If the tubing blows out, it becomes difficult to empty the can. If the tubing turns, the user is misled by the dispensing mark so that some of the contents is wasted.

An object of this invention is to provide a novel aerosol valve which may utilize a capillary dip tube.

Another object is to provide an aerosol valve, wherein the dip tube is positively anchored to the tail of said valve.

Still another object is to provide an aerosol valve wherein the dip tube will not turn or blow out during pressure filling of the can.

A further object is to provide an aerosol valve wherein the dip tube is optimally bowed to the lowermost portion of the can when the can is used.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing in which:

FIG. 1 is a side cross-sectional view of an embodiment of the aerosol valve of this invention.

FIG. 2 is a cross-sectional view of the valve of FIG. 1, taken along line 2—2.

FIG. 3 is a cross-sectional view of the valve of FIG. 1 taken along line 3—3.

Similar reference characters refer to similar parts throughout the several views of the drawing.

As seen in FIG. 1, the aerosol valve, in its broadest aspects, has a valve body 10 wherein the structure of the dip tube attachment tail 12 is such that the capillary dip tube 14 is inserted, with a force fit into the cavity of the tail and retained there by an inner annular anchoring means and, if desired, a flattened inner tubular cavity 18 preferably above the ring (see FIG. 2).

More particularly, the valve of this invention comprises a hollow tubular valve body 10. The lower end of which acts as the dip tube attachment tail 12. The inner surface of the tail contains an anchoring ring 16 and has a flattened tubular cavity (see FIG. 2) above said ring so that when a dip tube is force fitted into the tail 12, it is firmly anchored therein and furthermore is prevented from turning. Indeed, the flattened tubular cavity 18 and the anchoring ring 16 coact to almost permanently secure the dip tube to the valve body. Attempts at removal of the dip tube from the body frequently results in severance of the tube. Thus, it should be evident that a substantially permanent union between the tube and the valve body has been created.

Now specifically, describing all the elements of the aerosol valve, it consists of a hollow tubular valve body 10 having a dip tube attachment tail 12 extending downwardly.

Within the cavity of the valve body is a valve stem biasing means, preferably a helical spring 22, the lower end of which sits upon step 32 in the wall of the body. The upper end of spring 22 bears against the lower closed end of the valve stem 20 and biases it upwardly against sealing means 26, generally a resilient washer of rubber or plastic which is located between the upper end of the valve body 10 and valve housing 24. Housing 24 is crimped at 36 and 38 to the valve body.

It will be noted that the valve stem has an orifice 40 on its side wall, which is normally blocked by the valve sealing means 26. When the valve stem is depressed into the valve body by pressure upon the dispensing head 28, the orifice 40 is moved free of the sealing means and the contents of the aerosol are expelled by the force of the propellant within the can, through the cavity of the valve body, through the dispensing orifice, through the valve stem cavity, through passageway 42 and nozzle 44 in the dispensing head 28.

Affixed to the dip tube attachment tail of the valve body is a capillary dip tube. It is uniquely affixed to the tail by inserting it into the cavity of the tail to a depth wherein the annular anchoring ring 16 and the flattened tubular cavity of the valve body just above the anchoring ring 16 firmly grip the tube.

After the valve has been assembled and inserted into the crown top 46 of an aerosol can and crimped thereto at 48, the valve is in condition for pressure filling. During such filling the anchor ring 16 prevents the capillary dip tube from blowing out. And because of the flattened tubular cavity 18 of the dip tube attachment tail 12, the dip tube will not turn to change the direction of bow of the tube. If any vibration of the tube occurs, it will be absorbed by the free end of the tube. Because of such reliability in the direction of bow, the manufacturer may apply an appropriate mark on the dispensing head 28, or upon the hollow valve stem or upon the body to help in pointing the dispensing nozzle 44 in the same direction

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as the bow of the dip tube. Thus the user of the can will automatically tilt the can in the proper angular position for the most efficient emptying of the can.

Although the valve described is of the hollow stem variety it should be realized that the unique features herein may be applied to other embodiments of aerosol valves. For example, it may be applied to valves which utilize solid inverted mushroom-shaped valve stems.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claim is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described, what I claim as new and desire to secure by Letters Patent is:

A valve for use upon an aerosol can, said valve having

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a dip tube not subject to blow out or turning when said can is pressure-filled comprising a tubular valve body with a capillary tubular dip tube attachment tail and a dip tube affixed thereto by a force fit of said tube into the cavity of said tubular tail, said tail having dip tube anchoring means on its inner surface and a non-circular tubular cavity with one transverse dimension greater than another transverse dimension wherein said tube is firmly anchored to said tail and prevented from turning during pressure filling of the can, passage means within said valve body for dispensing material from said can, sealing means for said passage means and means whereby said valve is normally maintained in closed condition.

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