

May 19, 1970

R. F. EWALD
AEROSOL CONTAINER

3,512,685

Filed April 25, 1968

2 Sheets-Sheet 1

Fig. 1

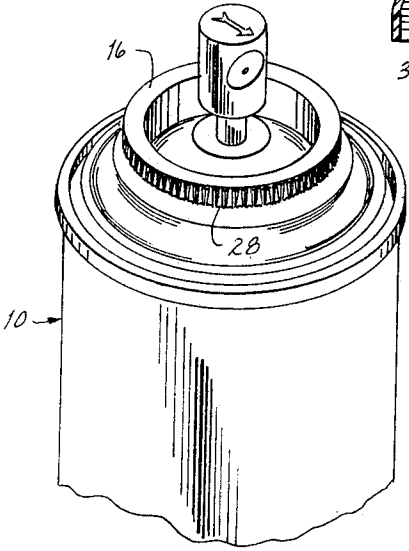


Fig. 2

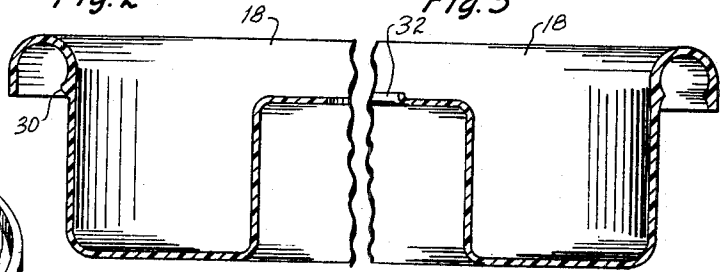


Fig. 3

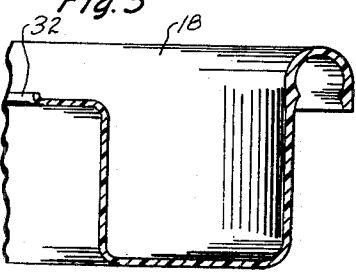


Fig. 4

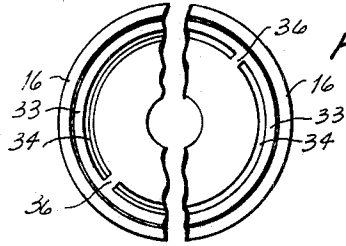


Fig. 5

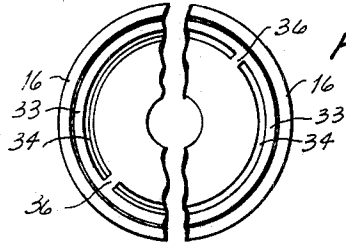


Fig. 6

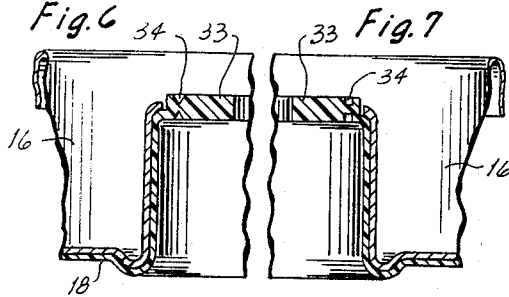


Fig. 7

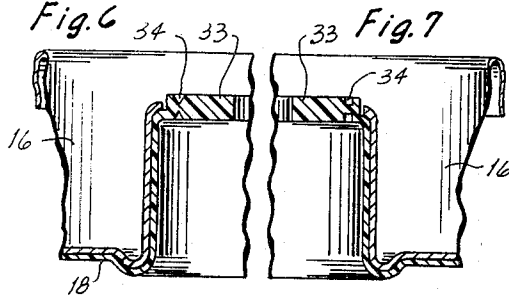


Fig. 8

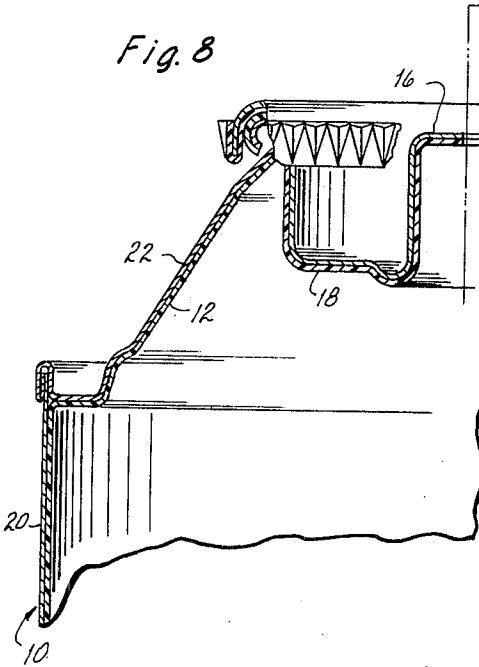
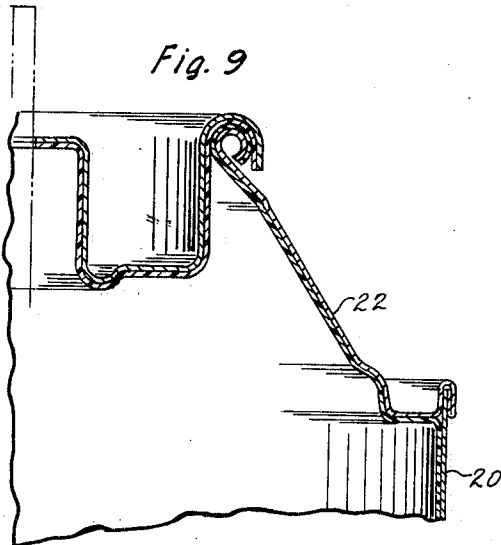


Fig. 9



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Fig 10

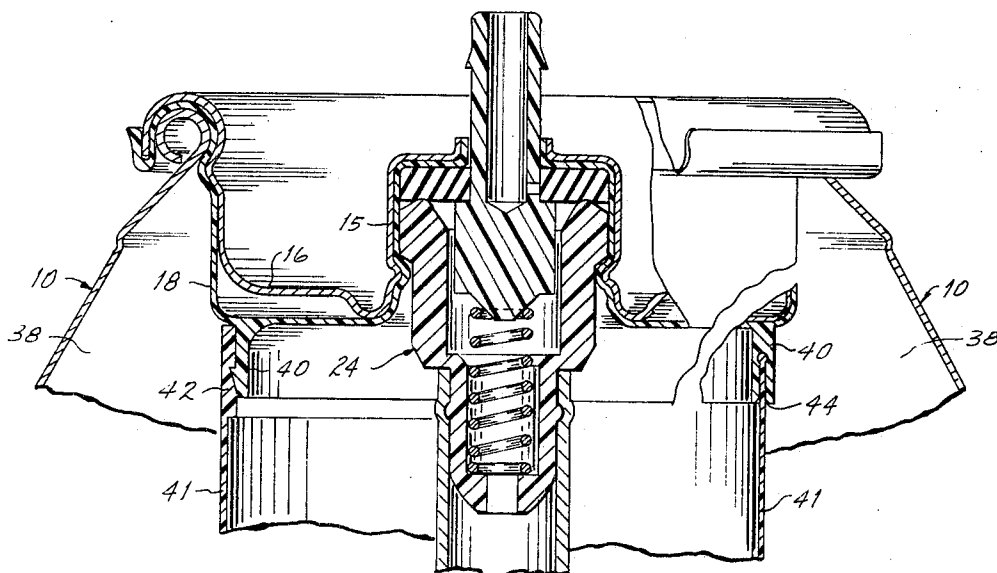
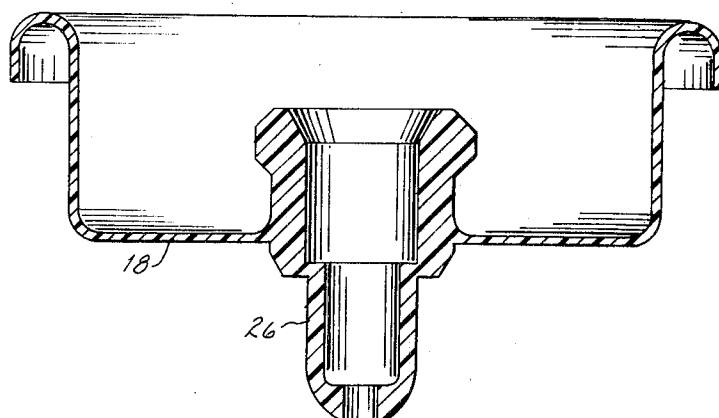


Fig. 11



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3,512,685

AEROSOL CONTAINER

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Filed Apr. 25, 1968, Ser. No. 724,010

Int. Cl. B65d 83/00

U.S. Cl. 222-396

4 Claims

ABSTRACT OF THE DISCLOSURE

An aerosol container with an inner auxiliary plastic container internal to the customary metal can. A preformed plastic disc contoured to fit against the inside of the usual mounting cup of the valve is crimped into the valve opening of the can to isolate all metal surfaces from the product within the container. The disc may be used decoratively or may have an annular inner groove to provide a safety release for excess pressure or be provided with an inner annular protrusion to hold a container of product separate from the propellant within the can.

This invention relates to an aerosol container and more particularly to a unique structure for an aerosol container and valve wherein the product is isolated from all metal surfaces.

The modern trend to convenience items, especially foods, has stimulated a great demand for aerosol dispensers. Today there is a great variety of products, available in aerosol form. It is likely that such a trend will continue at an even greater pace.

Each product has individual requirements. This has caused the development of many types and styles of aerosol containers. Certain requirements seem to be universal to the field.

One is that an aerosol container must be safe. The propellants, being pressurized, always presents the possibility of explosion, should the container be accidentally or intentionally exposed to heat. While manufacturers have tried to minimize the risk, nevertheless, an occasional potentially dangerous explosion does occur. This usually happens when trash is burned, either by an individual or by city sanitation workers. Until now, the only practical solution has been to strengthen the container. But this, unfortunately, increases costs as well as the violence of potential explosions.

An aerosol packaged product should also have a good shelf life. This requires not only good seals but also chemical inertness or isolation of the product, propellant, solvent, if any, and container. Many products unfortunately react chemically with the propellant, the container, or the components of the valve. This is particularly troublesome where the product is food. Indeed, only limited usage of aerosols has occurred in the food industry due to the tendency of many foods to take on an unpleasant taste because of admixture with the propellant or reaction with the metal usually used in aerosol containers. Attempts have been made to prevent reaction with the metal of the container by spraying a plastic film on the inside of the container. Unfortunately, such film usually has numerous pin holes which allows eventual interaction between the food and the metal. Isolation of the

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food from the propellant has also been tried by use of separate concentric compartments, but such a structure is usually too expensive.

An aerosol container must also be economical due to its throw-away nature. Fortunately, the manufacturing and filling procedure has been so developed that aerosols are feasible for all but the most inexpensive products.

An aerosol container should also be attractive. Many of the products dispensed from aerosol containers compete in very competitive markets. In many cases, success or failure depends upon consumer appeal for the ease of dispensing of the package.

It is therefore an object of this invention to provide an aerosol container of unique structure.

Another object is to provide an aerosol container of the above character wherein there is no contact between the product and the metal surfaces of the container.

Still another object is to provide an aerosol container with safety features incorporated therein.

A further object is to provide an aerosol container wherein the propellant may be isolated from the product.

A still further object is to provide an aerosol container which is uniquely decorative.

Another object is to provide an aerosol container wherein the valve body uniquely comprises a portion of the mounting cup liner.

Another object is to provide an economical aerosol container.

Another object is to provide an aerosol container with increased consumer appeal.

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

The invention, in its most basic form, comprises an internal and auxiliary plastic container and a preformed plastic disc, both of which, when sealed together, provide a plastic barrier between the product and the aerosol can and the customary mounting cup usually used with such can. The plastic container is just slightly smaller in dimension and therefore can be inserted into the aerosol can during formation of the can. The plastic disc is formed to fit the contour of the mounting cup of the valve. Then when the valve is crimped into the can, a plastic to plastic seal is provided and the product and propellant are isolated from all the metal of the can and the valve.

The structure, broadly described above, permits certain unique additional structures. For example, by utilizing excess rim material in the plastic disc, such rim may be used decoratively around the mounting cup. The disc may also be weakened by an annular score line and used in conjunction with a large axial opening in the mounting cup; a pressure safety is incorporated into the aerosol. One can also mold a valve body directly into the axial portion of the disc. Also, the mounting cup can be designed to retain an inner concentric chamber, whereby product and propellant may be stored separately. The product may be dispensed by the propellant collapsing the inner chamber, or by the use of a bleed valve which bleeds off the propellant with the product.

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 drawings in which:

FIG. 1 is a partial prospective view of an aerosol container embodying this invention with the decorative rim feature thereof utilized around the rim of the mounting cup of the valve.

FIGS. 2 and 3 are section views of two embodiments of the disc for lining the mounting cup.

FIGS. 4 and 5 are top views of the safety valve feature.

FIGS. 6 and 7 are partial cross sectional views showing the metal mounting cup and plastic disc-safety valve structure affixed thereto.

FIGS. 8 and 9 are cross sectional views showing the mounting cup with and without a decorative flaring of the plastic disc, crimped into the aerosol container.

FIG. 10 is a cross sectional view showing the auxiliary concentric chamber to separate the product from the propellant.

FIG. 11 is a cross sectional view showing the combined disc-valve body embodiment of this invention.

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

With particular reference to FIGS. 1, 8 and 10, it can be seen that the invention comprises an aerosol can 10 with an auxiliary plastic container 12 internal to said can. The open center top of both said can 10 and container 12 are closed by crimping a plastic lined mounting cup 16 into said open center. A plastic disc 18, contoured so as to fit mounting cup 16, lines the inside of the cup and is interspaced between cup 16 and container 12. In this manner a plastic to plastic seal is accomplished. Also, a closed all-plastic container is created for the product and propellant with no exposure to the metal surface of the can 10 or the mounting cup 16.

Normally can 10 is formed by first side seaming metal sheet 20 into a tube and then attaching a crown cap 22 with an open center about one end and a flat base about the other end of said tube. Auxiliary plastic container 12 may be inserted through the bottom or the top, prior to affixing the crown cap or the base respectively. The plastic container 12 is preferably a blown plastic container with an integral crown top and bottom. The crown top has an open center which coincides with the open center of the crown top 22 of the can 10.

Contoured disc 18 is placed in contact with cup 16 prior to crimping the cup into can 10. The can may be filled with product prior to such or by pressure filling through the valve, both in accord with customary practice.

A valve assembly 24 of customary design, is crimped into turret 15 of the mounting cup 16 prior to insertion of the cup 16 into the open center of the metal can 10 (see FIG. 10). The edge of the cup is then crimped inwardly about the head of the open center of the crown top of can 10. In one alternate embodiment (see FIG. 11), the valve housing 26 of the valve assembly 24 may be integral with disc 18.

For a decorative effect, the peripheral edge of disc 18 may be extended (see FIGS. 1 and 8), and turned up external to edge of mounting cup 16 to form a decorative flare 28. It may even be printed or embossed or scalloped etc. Such is most easily accomplished when the disc is still flat and prior to vacuum forming into the desired contour. Printing, etc., of the upturned edge may also be performed where the disc is injection or impact molded, after the molding thereof and prior to being joined to the underside of the mounting cup.

As seen in FIGS. 2 and 3, the disc may be extra thick at the rim area 30 of the mounting cup to avoid the need for gasket material usually used at such area. Also a valve guide 32 in the open center of the disc may be provided

to aid in assembly of the valve or mounting upon the can 10, or in use.

In another embodiment, disc 18 may be provided with raised central portion 33 within an enlarged center opening in cup 16 to act as a pressure relief means in the event excess pressure develops within the can. Portion 33 is provided with an annular scoring 34. Such scoring may be V-shaped or any other configuration, as desired. Preferably at one or more locations, groove 34 has a safety tab 36 (FIGS. 4 and 5), so that disc 18 may fracture at groove 34 but not be completely severed, thereby avoiding a missile-like pressure release.

FIG. 10 shows still another embodiment wherein the propellant and the product are isolated both from each other and, if desired, one or both from contact with the metal can. Where both the propellant and the product are isolated from contact, the plastic container within the can structure of FIG. 8 is utilized. In the more likely situation, where only the product is to be isolated from the propellant and the can but no concern as to isolation of the propellant from the can need be considered, the structure of FIG. 10 is preferred. In this embodiment an auxiliary concentric chamber 41 with a propellant reservoir 38 between chamber 41 and can 10 is provided. Chamber 41 is preferably of a pliant nature, such as polyethylene, polypropylene, nylon, etc., so as to transmit the pressure of the propellant charge to the product and thereby expel it out valve 24. In such structure, chamber 41 may be either stretched about an annular protrusion 40 on disc 18 with anchor ring 42 or said chamber may be pressed into an annular slot 44 in protrusion 40.

As should now be evident, a unique aerosol container has now been provided wherein contact between product and metal of the can is definitely insured. This is in contrast to the haphazard protection accomplished by spraying a liner coating within the aerosol can. The structure described also enables isolation of the propellant charge from either or both of the product and metal can. Disc 18 can be easily and economically fabricated from sheet plastic by vacuum forming. Or both the disc and the plastic container may be fabricated by injection or impact molding, with blow molding preferably used to fabricate the container. An increase in consumer appeal is obtained through use of the decorative flaring 28. And the possibility of potentially dangerous explosive device has been completely eliminated.

Now that the invention has been described, what is claimed is:

1. An aerosol container and valve comprising an outer can having an open end, a mounting cup for supporting said valve, a pre-formed plastic disc contoured to cover the entire interior surface of said mounting cup, said cup and plastic disc crimped to the open end of said can to seal the aerosol contents within the container, said cup having an enlarged central opening and said disc having a raised central portion to conform to said central opening, said raised central portion of said disc having an annular score line interrupted by safety tabs whereby said score lines provide a safety pressure release for the contents of said container and said tabs prevent said central portion from being propelled into the air.

2. The aerosol container of claim 1 further including an integral auxiliary plastic container for containing an aerosol product and propellant, said auxiliary container being contiguous to the entire interior surface of said can, and said cup crimped to the open end of said can with the plastic disc and auxiliary plastic container overlapping each other to effectuate a seal whereby the cap and can are separated from the aerosol contents of said container by the plastic container and disc.

3. The aerosol container of claim 2 wherein said disc is turned up along the peripheral edges of said cup external to the area adjacent the container so as to provide a decorative flair to said cup.

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4. The aerosol container of claim 3 wherein said disc is extra thick at the rim area of said mounting cup to act as a seal.

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U.S. Cl. X.R.

222—399; 222—402.24