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Morane

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[54] **CONTAINER FOR CORROSIVE PRODUCTS TO BE STORED UNDER PRESSURE**

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[51] **Int. Cl.** **B65d 83/14**

[58] **Field of Search** 222/105, 397, 183, 222/394; 220/63

[56] **References Cited**

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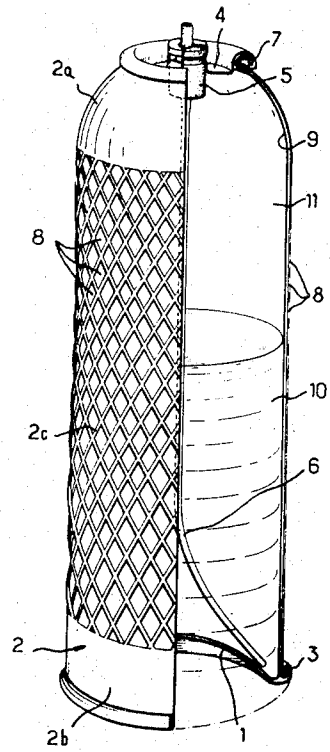
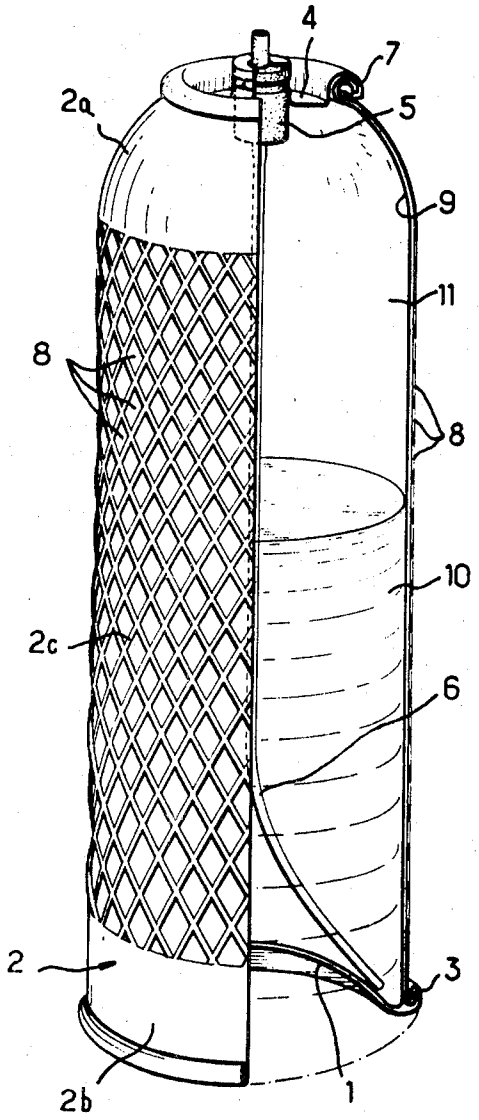
[57] **ABSTRACT**

Container for corrosive fluids to be stored under pressure comprises a strong, rigid, perforate can carrying a filling and dispensing valve and an inner plastic bag impermeable to liquids but permeable to gases, the interior of which is connected to said valve.

4 Claims, 1 Drawing Figure

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CONTAINER FOR CORROSIVE PRODUCTS TO BE STORED UNDER PRESSURE

SUMMARY OF THE INVENTION

When products which are relatively corrosive and have a tendency to decompose are stored under pressure there is always a risk that they will corrode the container. When the container is a metallic can of the aerosol bomb type it has already been suggested that the walls of the container be internally coated in a manner which will protect the metal against possible attack by the products stored therein. However, if this product is nevertheless capable of decomposition which will produce gas, such a coating will not prevent the possible creation of an excessive pressure inside the can, which is then capable of exploding.

It has already been suggested that the product be enclosed within a bag of deformable plastic material adapted to separate the product from the metallic walls of the container. The results are not, however, entirely satisfactory, because the sheets of plastic material composing the bags which hold the products are permeable to gas so that the decomposition gases which may be formed inside the bag diffuse through the walls of the bag and come into contact with the metallic walls of the container and neither the risk of corroding these metallic walls nor the risk of an explosive pressure are avoided.

It is the purpose of the present invention to provide a new container for products under pressure which is adapted to avoid both the above mentioned disadvantages.

It is the specific object of the present invention to provide as a new article of manufacture a container for products under pressure which are to be dispensed in the form of an aerosol spray or a fluid jet, which container comprises dispensing and filling valve means, which may be combined in a single valve, and is essentially characterized by the fact that it comprises a strong perforated wall which resists the internal pressure and a bag of plastic material permeable to the gas but impermeable to liquids, said bag having substantially the interior shape of the resistant wall, and the inside of the bag being connected to the outside of the container through the valve means.

In a preferred embodiment of the invention, the outer wall of the container is perforated by numerous holes distributed over a substantial area of this wall. The dispensing and filling valve is attached to a cap crimped to one end of the container, with the open end of the bag of plastic material gripped between the periphery of the cap and the edge of the container. The bag of plastic material is made of a sheet of flexible plastic material such, for example, as polyethylene, polyvinyl chloride or the material sold under the trademark Rilsan.

The bag of plastic material is formed by blowing, or by heat sealing a sheet of plastic material. The strong external wall of the container is a metallic wall made, for example, of aluminum or an aluminum alloy.

When the outer wall of the container is formed by stamping and drawing a metallic disc and then forming the base and the open end of the can, this wall has a cylindrical shape having no sharp angles and may be perforated by as many holes as desired after completion of the stamping operation. The bag of plastic material is then placed inside the metallic can and attached to the metallic wall along with the filling and the dispensing valve by crimping the periphery of the cap which carries said valve to the upper edge of the wall.

When the strong wall of the container is made from several pieces assembled together, the lateral part of the wall may have small pieces stamped out of it to form holes in a large portion thereof, which may have a decorative shape. The lateral part of the wall is then formed into a cylinder and a base is crimped to one end of this lateral part. The other end is shaped to make it slightly conical. The bag of plastic material is then introduced into the can and attached to the lateral wall by crimping it between the wall and the cap which carries the dispensing and filling valve.

In order to fill the container according to the invention, the desired quantity of the product to be stored therein is introduced into the bag of plastic material before or after crimping of the cap to the wall. Then, after crimping of the cap, the desired quantity of propellant gas which will cause dispensing of the products stored therein under pressure is introduced through the valve. The product is dispensed by actuating the container valve, and is ejected in response to the force exerted by the propellant gas in the form of a jet of fluid or an aerosol spray. Any of the gases conventionally used as propellants may be selected for this purpose, and in particular the light hydrocarbons such as butane and propane and the chlorofluorinated hydrocarbons sold under the trademarks "Freon," such as trichlorofluoromethane, dichloro-difluoromethane, and dichlorotetrafluoroethane. It is obvious that the quantity of propellant gas to be injected into the container according to the invention must be selected in dependence on the diffusion of this propellant gas through the walls of plastic material of the bag which encloses the stored product, in other words, in dependence on the average storage time of the container before use. The quantity of gas introduced into the container must remain sufficient to produce the desired operation when the user acts on the dispensing valve, despite the loss of some of this gas by diffusion through the wall of the plastic bag.

It is also clear that in selecting the propellant gas it is necessary to take into account the nature of the product to be stored so as to avoid any chemical interaction between the propellant gas and said product. In order that the container according to the invention may be used in all positions it is necessary to provide the dispensing valve with a depending tube extending the full depth of the bag which encloses the product to be dispensed. It will be appreciated that the container according to the invention makes it possible to prevent the metallic walls from being attached by the product stored therein, since this product is separated from the metallic wall by the plastic wall of the bag which encloses it. Moreover, the gases resulting from decomposition cannot attack the metallic wall since after having diffused through the plastic wall of the inner bag, they escape into the atmosphere through the perforations in the lateral wall of the metallic can. This escape is facilitated by the fact that the propellant gas diffuses at the same time through the material of the plastic wall the inner bag and thus serves as a carrier and diluting gas. I have thus solved the problem of inner corrosion of the metallic walls of the cans of this type.

Moreover, if the product stored is accidentally subjected to sudden decomposition and generation of gas an excessive pressure is produced within the plastic

inner bag which increases the speed of evacuation of the gases of decomposition. However, if the excessive pressure is too great, producing a situation which would result in explosion of a conventional container, the bag of plastic material breaks in alignment with the perforations of the metallic can, thus permitting relief of the excess pressure without producing any dangerous explosion. It will thus be seen that the inner bag of plastic material serves as a safety valve.

In order that the object of the invention may be better understood there will now be described, purely by way of illustration and example, a preferred embodiment of the invention, which is illustrated in the accompanying drawing on which:

The single FIGURE shows in perspective a container under pressure according to the invention with one-fourth of the wall thereof broken away.

Referring now to the drawing, it will be seen that the container according to the invention comprises a bottom **1** which is slightly dished and connected at its periphery to the lateral wall of the container indicated by reference numeral **2.** The annular joint formed between the base **1** and lateral wall **2** carries reference numeral **3.** At the end of the lateral wall **2** remote from the base **1** is a cap **4** which carries a central filling and dispensing valve **5** connected to a depending tube **6.** The cap **4** is connected to the lateral wall **2** by a crimped joint **7.** The container according to the invention is generally cylindrical in shape, but its upper part is slightly conical.

The lateral wall **2** comprises three zones, the first of which, **2***a*, near the cap **4,** is conical in shape. The second zone near the base **1** carries reference numeral **2***b*. Between the zones **2***a* and **2***b* is the zone **2***c*. The lateral wall **2** of the container according to the invention is made from a sheet of aluminum 1 millimeter thick. It has been stamped in the median zone **2***c* to provide lozenge-shaped openings **8.** The zone **2***c* thus appears to constitute a grille. The sheet which forms the lateral wall is then rolled into a cylinder, sealed along one of its generatrices, and the connected by crimping to the base **1** along the annular joint **8** and finally formed into a conical shape in the zone **2***a*. A bag **9** made of sealed polyethylene sheet material is then introduced into the metallic can formed in this manner. The bag **9** has a wall 1 millimeter thick. It has a substantially cylindrical shape and its free end extends slightly beyond the metallic can which contains it.

9,100 cm^3 of a hair dyeing composition having the following formula is then introduced into the bag:

-nonylphenol condensed with 4 molecules of ethylene oxide	23 g
-nonylphenol condensed with 9 molecules of ethylene oxide	25 g
-copra diethanolamide	6 g
-butylglycol	2 g
-propylene glycol	16 g
-20% ammonia	12 ml
-paratoluylene diamine	0.9 g
-para-aminophenol	0.9 g
-meta-diamine-anisol sulfate	0.06 g
-meta-aminophenol	0.2 g
-resorcinol	0.5 g
-nitroparaphenylene diamine	0.02 g
-hydroquinone	0.10 g
-sodium salt of diethylene-triamino-pentaacetic acid	1.5 g
-sodium bisulfite	1.2 ml
-water, q.s.	100 g

The cap **4** provided with its valve **5** and depending tube **6** is then positioned above the open end of the metallic can and the cap is crimped, together with the free end of the plastic bag **9,** to the lateral wall of the container. 30 grams of dichloro-tetrafluoroethane are then introduced through the valve **5** so as to produce above the stored product **10** a gaseous phase **11** under a pressure of 1.7 bars at 20°C.

It has been found that a container made in this manner may be stored with perfect satisfaction for 2 years at a temperature of 20°C. At the end of this storage period there still remains within the container a pressure of propellant gas sufficient to dispense the products stored therein.

It will of course be appreciated that the embodiment hereinbefore described has been given purely by way of illustration and example and may be modified as to detail without thereby departing from the basic principles of the invention.

What is claimed is:

1. Dispenser for storing fluids under pressure and equipped with dispensing and filling valve means, said container comprising a pressure resistant outer wall and an inner bag of plastic material permeable to gas but impermeable to liquids, said bag having substantially the inner shape of said pressure resistant wall, said outer wall being provided with a plurality of perforations extensively distributed thereover and providing direct access to the ambient atmosphere for gas passing outward through the greater portion of the wall of said bag, and the interior of said bag being connected to the exterior of the container through said valve means.

2. Container as claimed in claim **1** in which the dispensing and filling valve is attached to a cap which is attached to said outer wall by a crimped joint, with the open end of the bag of plastic material gripped in said joint between the cap and container wall.

3. Container as claimed in claim **1** in which the bag of plastic material is made of a flexible plastic material selected from the group consisting of polyethylene, polyvinyl chloride and Rilsan.

4. Container as claimed in claim **1** in which the pressure resistant wall is made of a metal comprising aluminum.

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