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CONTAINER FOR GASOLINE

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FIG. 1

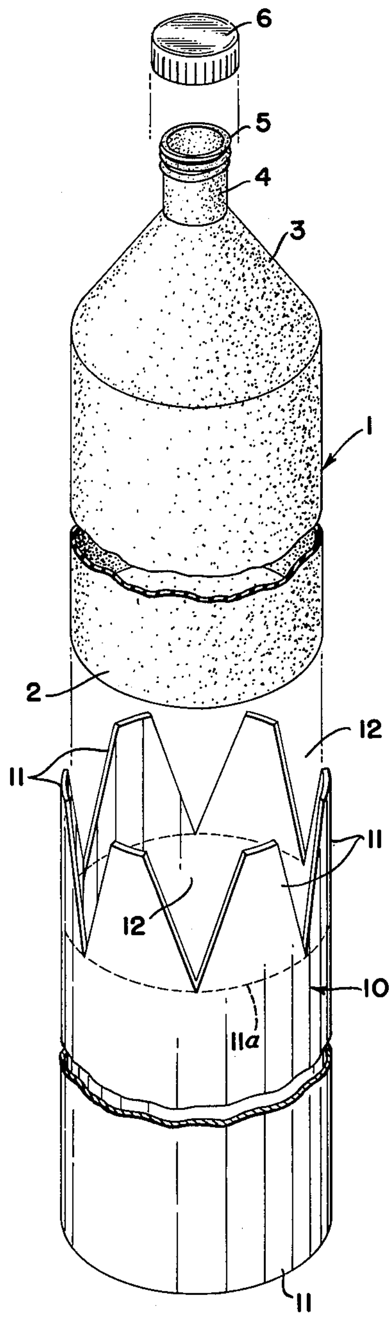
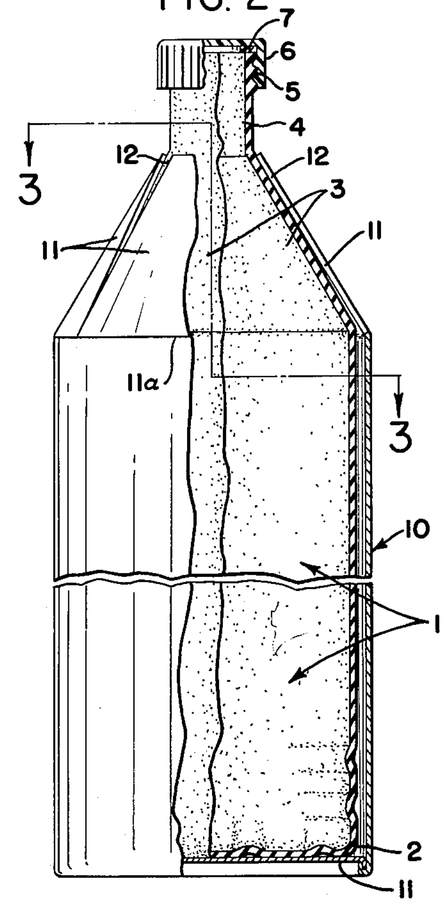


FIG. 2



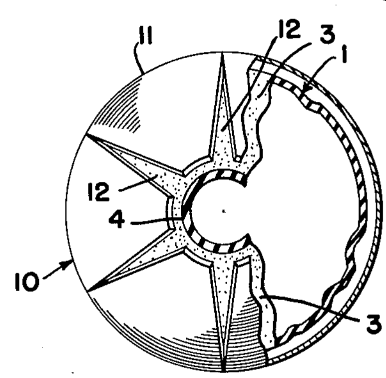


FIG. 3

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1

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CONTAINER FOR GASOLINE

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This invention relates to a container for gasoline.

The experience of running out of gasoline has occurred to many motorists. Statistics show that despite the fact that there is a service station at almost every main crossroads in the country, over a million motorists run out of gasoline each year. When this happens, it is necessary to get to a service station and get a can of gasoline and transport it to the stalled car, so that the car can then be operated to the service station for a fresh supply. As any motorist knows who has had the experience even once, it is time-consuming and annoying.

It would be highly desirable to be able to carry a reserve supply of gasoline in the car, so that if, for some reason almost always unforeseen, the motorist should run out of gasoline, he would have a supply that could be emptied into the tank which would get him to the closest service station.

The carrying of extra gasoline in the car, however, is dangerous and is often forbidden by law. The reason for this is that gasoline is quite volatile and inflammable and because both the liquid and the gaseous vapors within the container expand appreciably with heat. It is, therefore, impossible to hermetically seal a non-expanding gasoline container because if the car were sitting in the hot sun, the container may be heated so as to burst or leak, which would present a fire hazard. If the container is constructed with an opening or a vent so that it can "breathe" as the gasoline expands and contracts, combustible fumes will be emitted. If, for example, the container is kept in the trunk of the car, this "breathing" may fill the trunk with gasoline vapors which may become ignited by a spark and set the car on fire.

It is an object of the present invention to provide a gasoline container which avoids the above hazards and is safe to carry in the car.

These objects of the invention will be better understood in connection with the following description and drawings forming a part hereof and in which:

FIGURE 1 is an exploded and a perspective view of the gasoline container showing the cap removed from the bottle and showing the bottle separated from a protective sheath;

FIGURE 2 is a view, partly in section, showing the entire gasoline container within the bottle inside the protective sheath; and

FIGURE 3 is a top view taken along line 3—3 of FIGURE 2 looking in the direction of the arrows.

Referring now to the drawings, the gasoline container comprises a bottle **1** formed from a flexible rubber or rubber-like material, or plastic, which is flexible and elastic and which is insoluble in gasoline. By the words "rubber material" herein is meant any natural or synthetic rubber or plastic material which is elastic and flexible, which is gasoline insoluble. Those skilled in the art know how to select such materials. A rubber material suitable for this purpose is the so-called nitrile rubber formed from polyacrylonitrile.

The bottle is preferably of such dimensions that it holds approximately one gallon and for this purpose may be about 14 inches long and 4½ inches in diameter. The bottle has a bottom **2** and the upper portion is formed in the shape of a cone **3** which terminates in a neck **4**. Formed on the neck **4** are threads **5** so that a cap **6** having similar matching threads on the interior thereof may be screwed on the neck **4** so as to close the container. A seal **7** is provided within the cap so that when the cap is screwed on tight, the rubber bottle is hermetically sealed.

2

It will be understood that other dimensions may be employed but it is generally desirable to have the container big enough so that approximately one gallon of gasoline may be held in the container since this amount is about the minimum that will assure getting to the nearest service station. Smaller or larger sizes may, of course, be utilized.

A metal sheath **10**, generally cylindrical in shape, and having a bottom **11**, is adapted to surround the bottle. The upper portion of the sheath terminates in a plurality of fingers **11** formed integrally with the wall of the sheath but nevertheless deformable along the line **11***a* where the fingers join the wall of the sheath. The sheath **10** is formed of sheet metal of such strength as to resist puncture or bending in ordinary usage; the material of the thickness commonly used for forming heavy cans and pails is suitable.

The fingers **11** are so dimensioned that when they lie in the same plane as the sides of the can **10** there is a space **12** between them. This permits the fingers to be bent towards the center, as is shown in FIGURE 3, diminishing the space **12** between the individual fingers **11**.

In assembling the apparatus, the sheath **10** is formed with the fingers extending in a vertical upright position and the rubber bottle **1** is then dropped into the sheath. The fingers are then bent inwardly so as to follow generally the contour of the conical portion **3** of the bottle and the fingers act to retain the rubber bottle within the sheath.

The dimensions of the bottle and the sheath are critical and the outer volume occupied by the bottle **1** when filled must be not more than 90% of the volume occupied by the interior volume of the sheath **10**. In other words, there is a 10% free space between the rubber bottle and the metal sheath. This is essential in order to permit expansion. If the rubber bottle has a volume of approximately one gallon and is filled with gasoline at ambient temperatures, it will expand no more than 10% throughout the normal temperature range to which the container is apt to be subjected in all foreseeable normal usages.

Thus, if the car is sitting in the sun in the desert, and the temperature rises within the trunk of the car where the container may be kept, for example, the gasoline and the vapors will expand and the rubber being flexible and elastic will similarly expand but the volume of the rubber bottle will not more than fill the volume of the metal sheath.

In the structure shown, the rubber will be protected against puncture and there will be no possibility of "breathing" or rupture to emit dangerous or explosive gasoline fumes.

In the event that the temperature would exceed all normal temperatures to which the container may be subjected so that the rubber bottle expands more than the 10% permitted by the volume of the sheath, the fingers **11** which are bent along the line **11***a* have sufficient flexibility so that they will be pushed outwardly by any additional expansion, and in this way, the possibility of rupture avoided even though the container is subjected to abnormal temperatures.

I am aware that it has been proposed heretofore to line containers with a flexible bag-like material, such as, for example, as shown in Patent No. 2,338,604. However, in such proposals, there is no recognition of the need to provide for the expansion of gasoline which is attained by critical dimensions between the container and the bag that is contained therein, nor the need to provide for further expansion should the temperature cause expansion beyond the limits provided for by said critical dimensions.

I believe my invention will be a great boon to motorists who can drive with confidence and without anxiety about running out of gas and will eliminate all hazards that have heretofore been attendant to the carrying of an emergency supply of gasoline in the car, particularly the the trunk thereof.

What I claim as my invention is:

1. A container for an emergency supply of gasoline adapted to be carried in a car, comprising a bottle having sides and a bottom and a smaller upper neck portion integral thereof, said bottle being formed of a rubber material insoluble in gasoline, a sealing cap, and means for securing said cap to the neck portion whereby the rubber bottle may be hermetically sealed; a rigid sheath for said rubber bottle to protect said bottle against puncture during usage, the internal volume of said sheath being at least 10% greater than the external volume of said bottle when filled whereby the contents of said bottle may expand as much as 10% within said sheath without causing rupture thereof, and readily flexible retaining means at the neck end of said sheath for retaining said bottle therein whereby said retaining means may flex and prevent rupture of the sheath in the event that the bottle expands more than the 10% permitted by the sheath.

2. A container as recited in claim 1 wherein said flexible retaining means includes a plurality of spring fingers provided on said rigid sheath.

3. A container for an emergency supply of gasoline adapted to be carried in a car, and comprising a bottle having a side wall, a bottom end wall, and a top end wall united with said side wall, said top end wall including a smaller neck portion integral therewith, said bottle being constructed from a rubber-like material insoluble in gasoline, a cap, means for hermetically sealing said cap to said neck portion, a rigid sheath enveloping the major portion of said bottle to protect the same against puncture during usage, said sheath being provided with a plurality of spring fingers overlying said top end wall closely adjacent thereto, the internal volume of said sheath being sufficiently greater than the external volume of said bottle to accommodate enlargement of said bottle due to expansion over normal temperature ranges of any gasoline contained therein.

4. A container for volatile liquid comprising receptacle

means of variable volume to accommodate varying pressures caused by varying temperatures of a volatile liquid stored therein, opening means communicating in fluid-conducting relation with said receptacle means for filling and unfilling the receptacle means with said volatile liquid, hermetic sealing means releasably engaging said opening means to thereby seal said volatile liquid in said receptacle means, sheath means protecting the receptacle means from rupture and permitting and limiting increases in volume of a first portion of the receptacle means to a predetermined amount, and yieldable means in connection with said sheath means permitting further increases in volume of a second portion of the receptacle means if the pressure within the receptacle means increases after the volume of said first portion reaches said predetermined amount.

5. The combination of claim 4 in which the predetermined amount is at least 10% greater than the volume of the first portion when the receptacle means is filled.

6. A container for an emergency supply of gasoline adapted to be carried in a car, and comprising an elongated rubber bottle insoluble in gasoline and of variable volume to accommodate varying pressures caused by varying temperatures of the gasoline stored therein, an externally threaded neck portion integral with the bottle and projecting from one end thereof in fluid conducting relation with the inside of the bottle to facilitate filling and unfilling the bottle with gasoline, an internally threaded cap for threaded engagement with the threads of the neck portion to hermetically seal the gasoline in the bottle, a metal sheath substantially surrounding a major portion of the bottle on the end opposite said cap to protect the rubber bottle from inadvertent rupture and dimensioned to permit and limit expansion of said major portion of the bottle to a predetermined amount greater than 10% of the volume of the portion when filled, integral yieldable fingers projecting from the metal sheath in the direction of the cap permitting further expansion of a second minor portion of the bottle adjacent the cap if the pressure within the bottle increases after the volume of the major portion of the bottle reaches said predetermined amount.

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