May 24, 1955 J. A. SPERRY 2,708,830

PORTABLE DRINK DISPENSER

Filed July 22, 1952 4 Sheets-Sheet 1

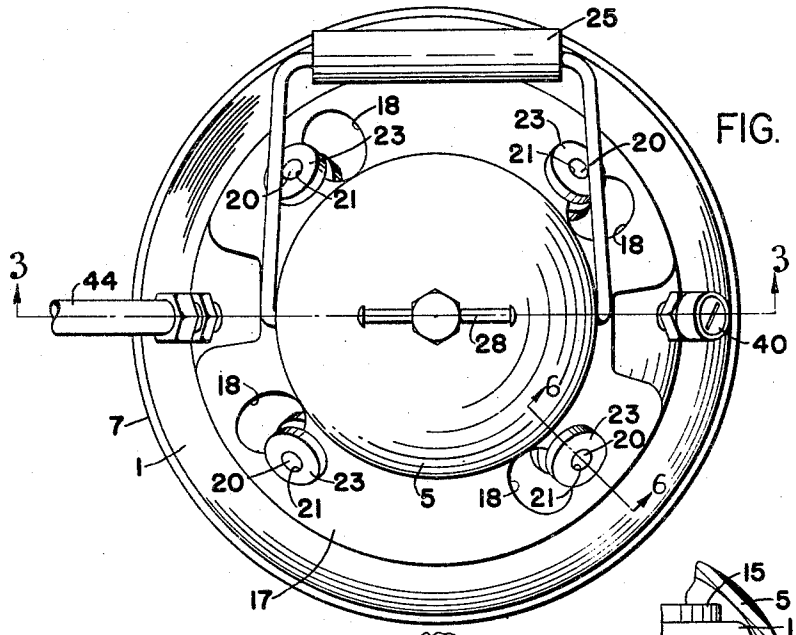


FIG. 1

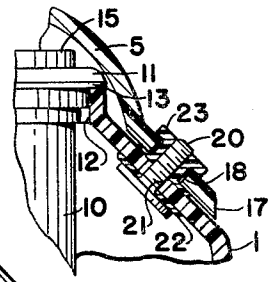
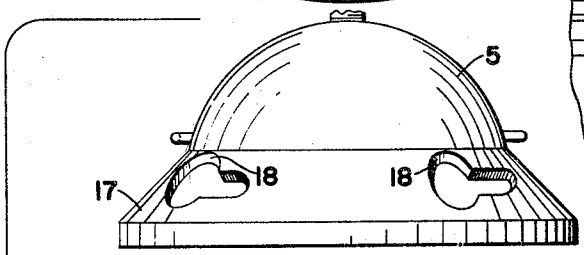


FIG. 6



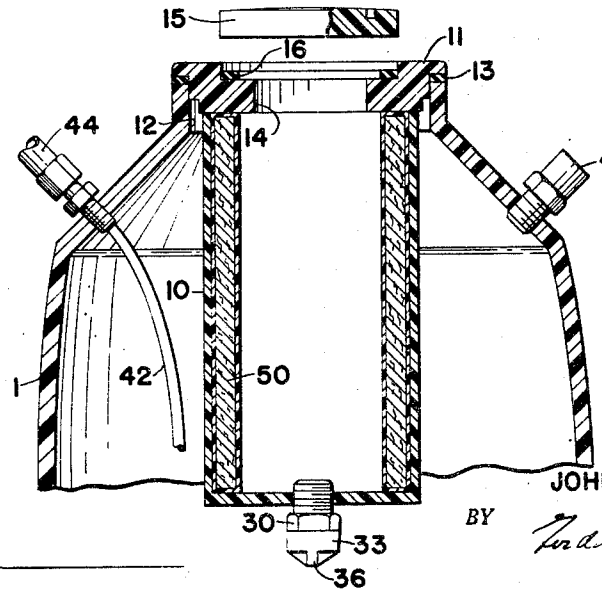


FIG. 4

INVENTOR.
JOHN A. SPERRY
BY
ATTORNEY

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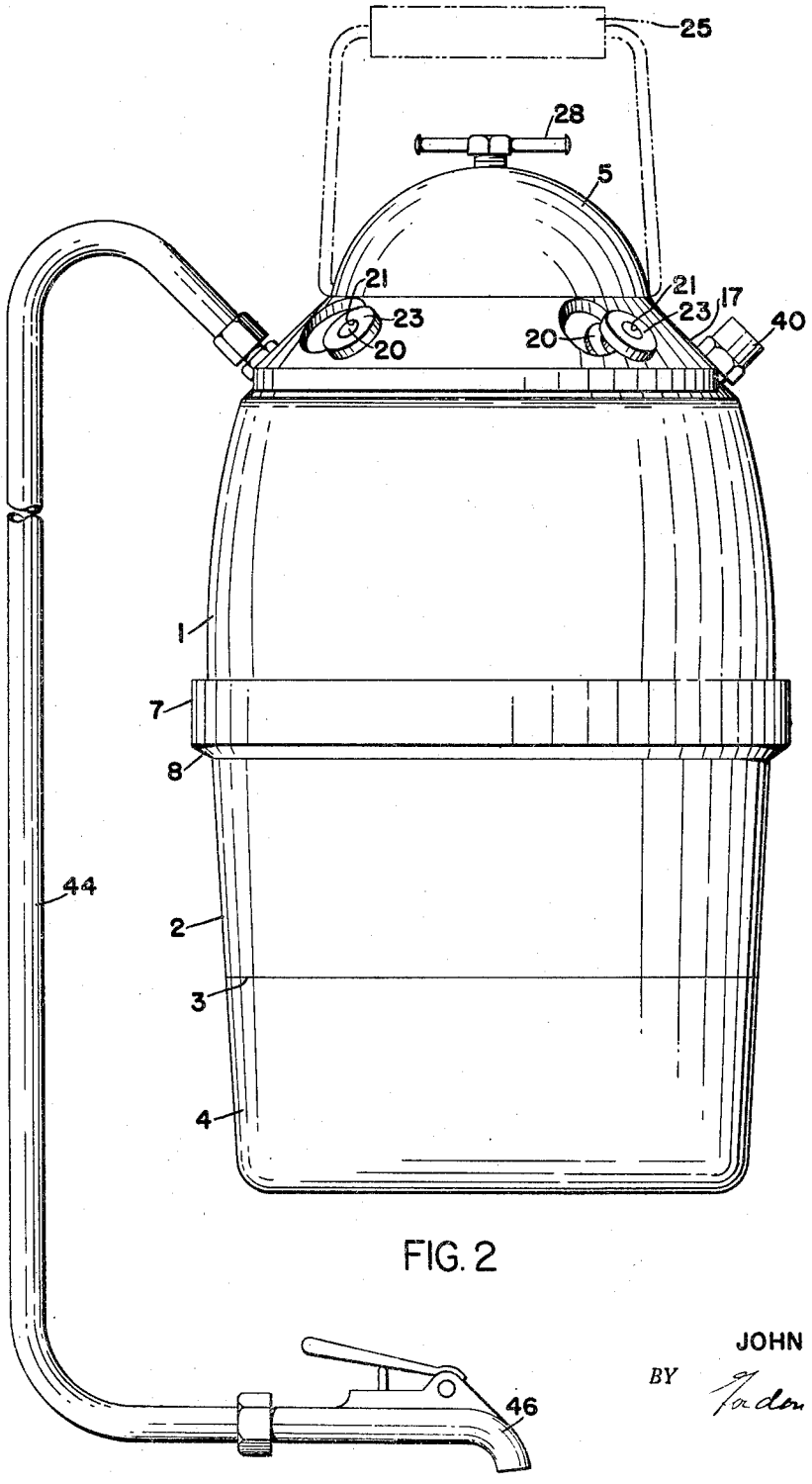


FIG. 2

INVENTOR.
JOHN A. SPERRY

BY Jordan C. Clark

ATTORNEY

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PORTABLE DRINK DISPENSER

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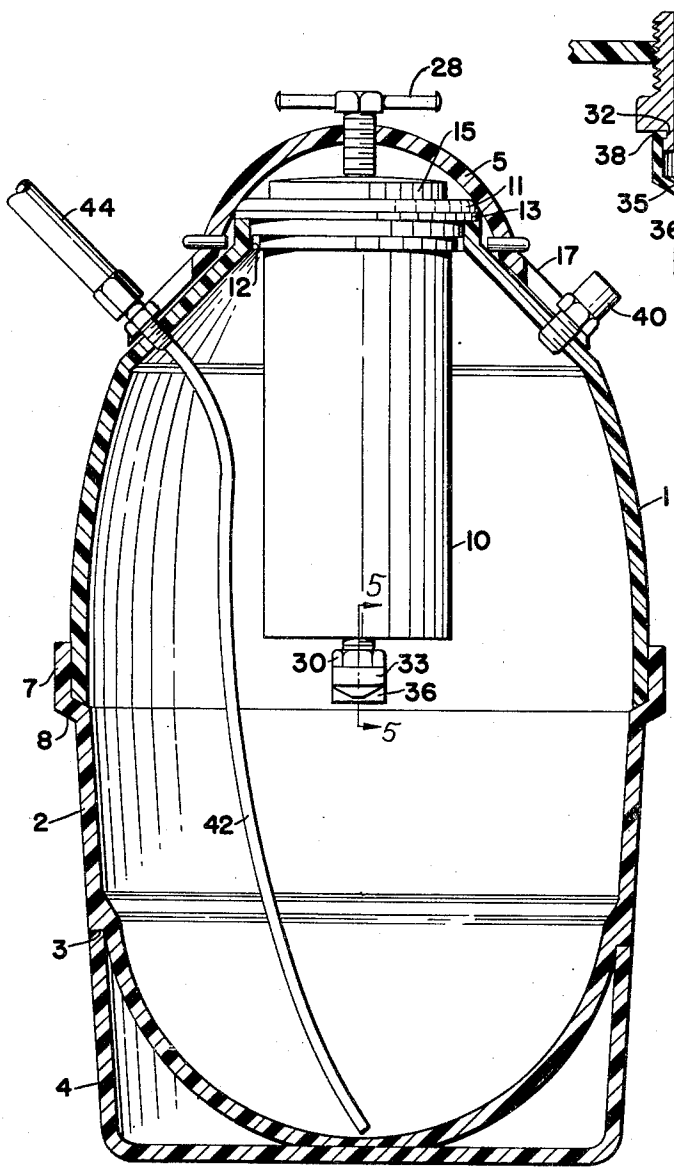


FIG. 3

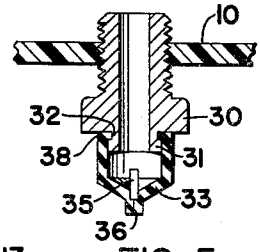


FIG. 5

INVENTOR.
JOHN A. SPERRY

BY Gordon C. Mack

ATTORNEY

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PORTABLE DRINK DISPENSER

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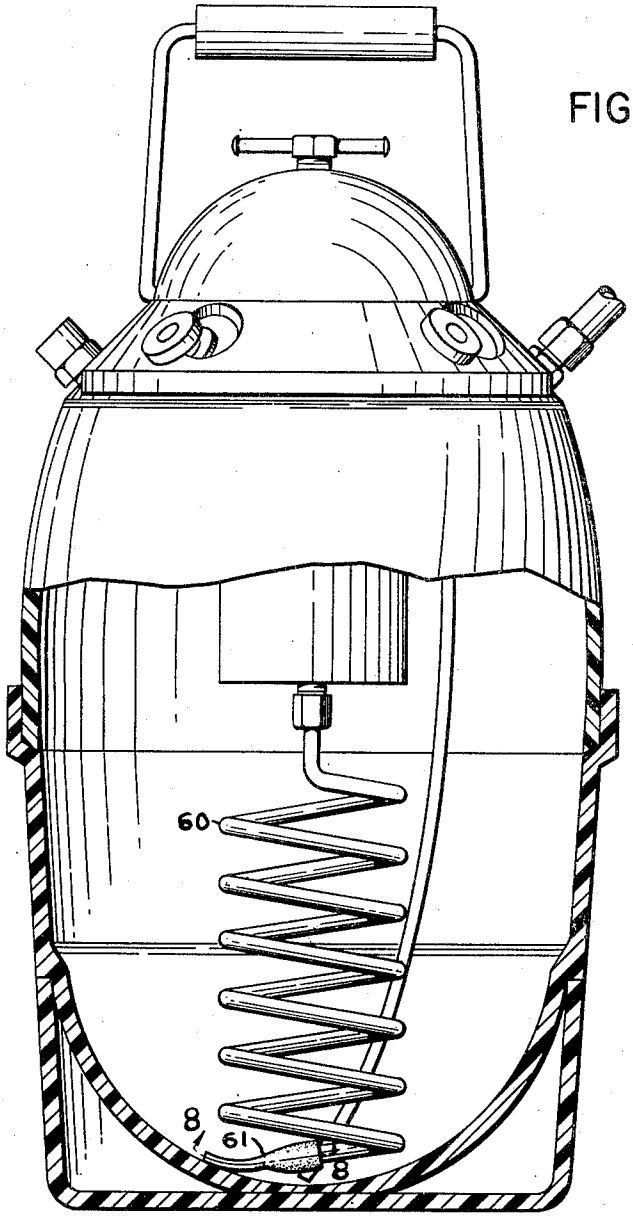


FIG. 7

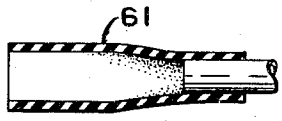


FIG. 8

INVENTOR.
JOHN A. SPERRY

BY

ATTORNEY

United States Patent Office 2,708,830
Patented May 24, 1955

2,708,830

PORTABLE DRINK DISPENSER

John A. Sperry, Tallmadge, Ohio

Application July 22, 1952, Serial No. 300,269

3 Claims. (Cl. 62—91.5)

This invention relates to a portable container for dispensing drinks such as beer, etc. The container includes a removable cooling unit for carbon dioxide to keep the drink cold. As the carbon dioxide gasifies it is discharged from the cooling unit into the storage container which holds the drink, and the pressure thereby generated is used to force the drink out of the container through a dispensing tube.

The cooling unit is located in an opening in the top of the storage container. It is removed when fresh drink is to be added to the dispenser, and the drink is introduced through the opening. The opening is relatively large and gives access to the interior of the dispenser for cleaning, etc.

The top of the cooling unit is provided with a fitting which includes a flange which rests on the edge of the opening in the storage container. There is an opening in the fitting through which the solid carbon dioxide is introduced. A cover fits into this latter opening. It may be held in place in any suitable manner. In a preferred form of the invention, there is a cap which is removably fastened to the top of the storage container over the fitting. A screw threaded through the top of the cap is adapted to be turned down against the closure to hold it in place.

There is a one-way valve near the bottom of the cooling unit through which all of the carbon dioxide generated in its passes into the storage container. The pressure of the carbon dioxide on the drink in the storage container forces it out through a dispensing tube, the inner end of which is located near the bottom of the storage container. The flow of liquid through the dispensing tube is controlled by providing a suitable nozzle at the outer end of the tube. There is a relief valve in the storage container which prevents excess pressure from being developed within it.

The storage container is preferably formed of a dome-shaped top, a bottom which is the shape of an inverted dome, and a support for the latter. These three parts are united to one another by suitable means.

The storage container, the cooling unit and the cap are all preferably molded from fibre glass and a thermoplastic or a thermosetting resin. The fitting and closure for the cooling unit may be similarly constructed. Many resins are now used in the fabrication of articles from fibre glass. In general, any of these resins may be used which are non-toxic and insoluble in the drink which is to be dispensed, and are solid at summer temperatures and not brittle at temperatures somewhat above freezing at which drinks are customarily dispensed. The polyester resin known as Selectron 5003 (manufactured by Pittsburgh Plate Glass Company) has been found satisfactory. A solution of this resin is satisfactory for bonding the molded pieces of the storage container to one another and for bonding this container to the support.

The dispensing tube necessarily passes near the outer wall of the cooling unit. To prevent the cold from freezing the drink in the tube and thus plugging it up, it has been found desirable to insulate the vertical walls of the unit. For this purpose a bag of glass fibres is located against the inner surface of these walls.

The dispenser is provided with a handle or strap or the like so that it can be easily carried, and it is designed particularly for dispensing beer and other drinks (carbonated or not) at sports events, picnics, etc.

The invention will be further described in connection with

Fig. 1 is a plan view of the dispenser;

Fig. 2 is an elevation of the dispenser;

Fig. 3 is a vertical section of the dispenser on the line 3—3 of Fig. 1;

Fig. 4 is an exploded view partly in section of the top of the dispenser showing the cooling unit, its closure, and the cap which fits over this end of the dispenser;

Fig. 5 is a detail of the one-way valve in the bottom of the cooling unit, on the line 5—5 of Fig. 3;

Fig. 6 is a detail in section showing how the cap is fastened to the dispenser;

Fig. 7 is an elevation, partly in section, of a modified form of the invention; and

Fig. 8 is a section on the line 8—8 of Fig. 7.

The storage container is formed of the dome-shaped top **1** and the bottom **2** which is of inverted dome shape. There is a ledge **3** on the exterior of the container near its bottom. This rests on the support **4**. The cap **5** is fastened over the top of the dispenser.

The bottom **2** of the storage container is formed around its top edge with a rim **7** and a ledge **8** immediately inside of the rim. The dome-shaped top **1** fits snugly within the rim **7** and rests on the ledge **8**. The top **1** is cemented to the bottom **2**, and the bottom **2** is cemented to the support **4**.

As best shown in Fig. 4, the cooling unit **10** for the frozen carbon dioxide is provided with a fitting which includes the flange **11**. This unit is supported in the opening **12** in the top of the container. The gasket **13** rests on the rim of the opening. The flange **11** rests on this gasket. There is an opening **14** in the fitting which is closed by cover **15**. The gasket **16** surrounds the opening **14** and forms a tight seal with the cover **15**.

The skirt **17** of the cap **5** is provided with four evenly spaced, keyhole openings **18**. These are used to fasten the cap on the dispenser. Four evenly spaced, threaded studs **20** are passed outwardly through openings **21** in the top part of the dispenser. Gaskets **22** are located under the heads of studs **20** to form a liquid-tight seal. Spools **23** are screwed down tight on the studs **20** and the intention is that they shall never be removed. To fasten the cap **5** on the dispenser the large portion of each keyhole opening is placed over one of the spools and the cap is turned clockwise to bring the narrow portions of the keyhole openings about the shanks of the respective spools. The weight of the container can be supported by the handle **25** which is fastened into the cap.

The screw **27** is threaded through the top of the cap **5** and in its outer end is the pin **28** which is used to facilitate turning the screw **27**. After the unit **10** has been placed in the opening **12** of the storage container, with the flange **11** resting on the gasket **13**, and the closure **15** in place, cap **5** is placed over the flange **11** and closure **15**, and turned so that the keyhole openings in it engage the spools **23**. The screw **27** is then turned down against the closure **15** to hold it tightly in place.

Thus the cap 5 forms an insulating chamber over the cover 15.

The metal fitting 30 is screwed down into the bottom of the cooling unit 10. Its bottom end 31 is of slightly greater diameter than the neck 32 by which the portion 31 is connected to the balance of the fitting. The rubber nipple 33 is fitted over this portion 31. There is a slot 35 in the inner surface of the nipple that extends across the bottom and a short distance up the wall at each end. There is a slit opening 36 in the bottom of this nipple which readily opens when pressure develops inside of the holder 10. The slot 35 extends upwardly from the slit 36 and facilitates the opening of the slit 36 by reducing the thickness of rubber which must be flexed to produce an opening. The upper edge of the rubber nipple extends inwardly at 38 about the neck 32.

This one-way valve construction in the rubber nipple permits carbon dioxide gas to escape from the cooling unit 10 into the container. When excessive pressure is built up in the container, the relief valve 40, which is of any usual construction, opens and vents the excess gas to the atmosphere. The pressure of gas within the storage container is maintained at a sufficiently high level to force the drink out through the dispensing tube 42. The portion of this tube within the storage container is ordinarily of relativey rigid plastic and its lower end is always held just above the bottom of the interior of the container. The upper end of this tube is held in the metal coupling 43. A flexible dispensing tube 44 which will ordinarily be of vinyl resin or other plastic which does not impart taste to the drink, is fastened onto this fitting by the coupling 45. The outer end of the tube 44 is provided with any suitable dispensing nozzle 46.

The dispensing tube 44 comes so close to the outer wall of the cooling unit 10 that if this wall is relatively thin it is advisable to protect it by the insulating bag 50. This bag is annular and is filled with glass fibres or the like. The bag may be of polyethylene or other plastic film that does not become rigid when cooled to the temperature of frozen carbon dioxide, and is of such diameter that it fits against the wall of the refrigerating compartment. The insulating bag 50 prevents the contents of the dispensing tube 44 from becoming cold enough to freeze and plug the tube.

To use the dispenser, beer or other drink is put in the storage container. Frozen carbon dioxide is placed in the cooling unit 10 either before or after it is located on the container. This unit is closed with the cover 15. The cap 5 is then lowered in place and turned in a clockwise direction to engage the narrow portions of the keyhole openings 18 with the spools 23. This locks the cap in place. The pin 28 is turned to press the bottom end of the screw 27 against the top of the cover 15 (as illustrated in Fig. 3), and hold it in place.

Gases are generated by the carbon dioxide as it cools the drink. These pass from the cooling unit through the slit opening 36 in the one-way valve 33 into the storage container. They maintain the drink under pressure greater than atmospheric and tend to carbonate it, or at least prevent the loss of carbon dioxide. As the nozzle 46 is opened from time to time to deliver drink from the dispenser, the pressure of the carbon dioxide gas within the storage container forces the drink out through the dispensing tube. Any excess pressure generated in this container is exhausted through the relief valve 40.

The drink is dispensed from time to time until the container is empty. The pin 28 is then turned to loosen the pressure of the screw on the cover 15 and the cap is turned in a counterclockwise direction to disengage the narrow portion of the respective keyhole openings from the spools 23. The cap is then lifted from the container. The cooling unit 10 is lifted from the storage container. An additional supply of drink is introduced into the container through the opening 12. The cooling unit 10 is then put back in place and it is charged with fresh carbon dioxide as required. The cover 15 is then again put in place and by turning the pin 28 the assembly is completed.

The dispenser may be made in several sizes ranging, for example, from one gallon to five gallons, or more. The size and the shape of the cooling unit 10 will vary depending upon how much carbon dioxide will be required to cool and dispense the drink from the container, and the length of time the drink is to be stored in the container. The metal fitting 30 may be replaced by a Nylon tube. In the modification shown in Figs. 7 and 8, a cooling coil 60 is provided in the bottom of the cooling unit so as to use to better advantage the cooling effect of the gases given off by the carbon dioxide. This coil may be of stainless steel, plastic, etc. It may be perforated, but all of the gases preferably pass the length of the coil and out into the bottom of the container through the one-way valve 61. This valve is made of a short length of flat rubber tubing. One end is expanded over the end of the coil. No gases enter the coil through the flattened end of the tubing. The walls of the container and the compartment 10 will ordinarily be about one-quarter inch thick, but may be somewhat thinner or considerably thicker. The compartment 10 may be relatively long and narrow so that the one-way valve 23 is immersed in the liquid even though there be but little liquid in the container. However, this is not necessary and generally it will be made relatively short so that the one-way valve 33 is out of contact with the liquid after the first portion of the liquid has been withdrawn from the container, unless the cooling unit is provided with a cooling coil such as is illustrated in Fig. 7.

What I claim is:

1. A dispenser with a relief valve therein, which dispenser is formed of a container having an opening at the top thereof, a dispensing tube passing through the container near the top thereof with its inner end near the bottom of the interior of the container, a cooling unit for frozen carbon dioxide in the opening with a flange at the top thereof which rests on the top of said container around the opening, said unit being removable from the container, means for the passage of carbon dioxide gas from said unit into said container, a large opening in the flange with a removable closure therein, evenly spaced studs projecting outwardly around the top of the container, a cap fitting over the flange and closure with a skirt having keyhole openings therein with the smaller portions thereof engaging the studs and releasable therefrom by turning the cap, and a screw threaded through the top of the cap with its bottom pressing on said closure, and means at the outer end of the screw to facilitate turning the same.

2. A dispenser formed of a storage container having an opening near the top thereof and a dispensing tube passing through the wall thereof with the inner end of the tube terminating near the bottom of the interior of the container, a cooling unit for frozen carbon dioxide removably located in the opening, an opening in the top of the cooling unit and a removable cover laid thereon, means for passing carbon dioxide gas from said unit into the interior of said container, a relief valve in the dispenser for the release of gaseous carbon dioxide therefrom, a closure cap fitting onto the end of the container and over the cover of said unit and enclosing the opening in the container, with means on the container with which the cap is disengageably loosely engaged so as to be capable of substantial movement at least a limited distance upward therefrom, and a screw threaded through the cap with its lower end pressing against the cover and with means at its upper end to facilitate turning it said closure cap being dome shaped with continuous contact thereof with the storage container about the opening whereby an insulating chamber is formed over the cover.

3. A dispenser formed of a storage container, a cooling unit for frozen carbon dioxide and a support, said con-

tainer being formed with a dome-shaped top, the bottom of the container being the shape of an inverted dome with a ledge and rim around the top, the dome-shaped top resting on the ledge within the rim and adhered thereto, the bottom being formed with a ledge on its under surface, said support being located under the container with the ledge resting on the support and adhered thereto, an opening in the dome of the top, with said cooling unit projecting through the opening, there being means for passing carbon dioxide gas from said unit to the interior of said container.

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