Aug. 30, 1966 J. F. WEISS 3,269,141

BEVERAGE CONTAINER

Filed Feb. 26, 1965

FIG. 1

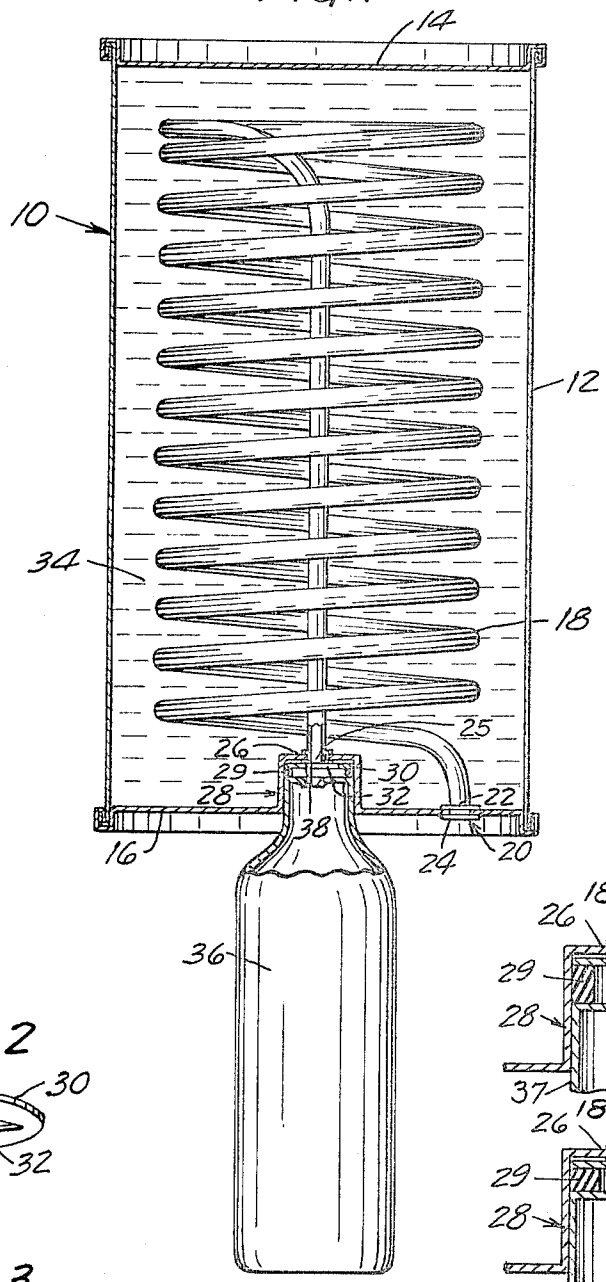


FIG. 2

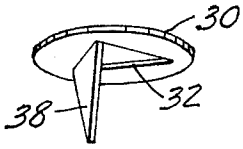


FIG. 3

FIG. 4

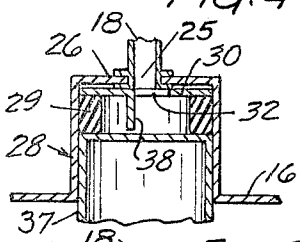
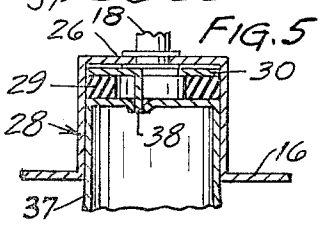


FIG. 5



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BEVERAGE CONTAINER

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This invention relates to unitary containers for potable materials in which the temperature of the contents may be readily altered from ambient temperature to a preferred temperature for consumption.

In particular it relates to cans containing liquids which are normally or preferably consumed at a temperature within the range of 33–45° F.

Others have addressed themselves to the problems of heating and cooling of foodstuffs, beverages, etc., see for example United States Patents 2,425,900, 2,373,611 and 2,579,405.

It is an object of the present invention to provide a container which is relatively simple to manufacture, which does not require a change in the present dimensions of commonly used commercial beverage cans and which is capable of being subjected to the stresses and forces encountered in normal production, packaging and shipping of such containers.

The present invention provides a hermetically sealed container for beverages and the like with external entry and exit ports connecting an isolated convolute passageway through the internal regions of the container whereby controlled passage of a liquified gaseous material through the contents of the container may be utilized to effect alteration (e.g., cooling) of the contents of the container.

Other objects of the invention will appear from the accompanying drawings and the detailed description therewith.

In the drawings:

FIGURE 1 is a vertical section through the outer shell of a container according to the invention, and showing abutting thereagainst (in partially broken away form) a cartridge source of coolant material;

FIGURE 2 is an inferior perspective view of a piercing means used in the container of FIGURE 1;

FIGURE 3 is an inferior perspective view of a sealing member used in the device of FIGURE 1;

FIGURE 4 is a vertical section of the presently preferred form of entry port in the container of FIGURE 1 immediately before puncturing the seal on the source of coolant; and

FIGURE 5 is another vertical section of the entry port illustrating an initial stage in puncture of the sealed end of the coolant cartridge.

Referring now to FIGURE 1, the container **10** is of known construction having any conventional cylindrical sidewall **12** and sealed top end **14**, but the bottom sealed end **16** has been modified according to the present invention by the provision of two apertures therein connecting a convolute passageway defined by a heat-conducting tubing **18**. One aperture is an exit port **20**, to which one end of the tubing is fixed, as by soldering an internal gasket ring **22** and crimping of the terminal portion **24** of the tubing in order to provide a seal which prevents leakage of the contents **34** of the container. Instead of a soldered gasket ring other means for affixing the tube may of course be employed; e.g., forming the gasket in situ, as by swagging, or by use of metal to metal adhesives which are non-toxic when cured or thermoset, etc.

The other end of the tubing **18** is also fixed in the end **16** of the container in a similar manner, at an entry port **25**, which is centered at the bottom of a cylindrical depression **28**, the latter being formed as by metal stamping or deep drawing of the depression in the end **16**. Piercing means **30**, comprising a disk having a barb **38** extending perpendicular from the plane of the disk is positioned in the inferior portion of the depression and against the end **26** of the depression.

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The piercing means **30** may be simply and economically produced by a V-shaped stamping in a relatively thin circular disk or piece of sheet metal, as illustrated in FIGURE 2, the thus formed inner wall **32** and corresponding portion of the barb **38** defining an opening which communicates with the interior of the tubing **18**.

The piercing member may be adhesively held against the end **26**, or simply may be held in place by gasket means **29**, such as a friction-fitting elastomeric or plastic "O" ring or quad ring as shown in FIGURE 3. In a preferred form of the invention this gasket further functions to prevent undesired escape of gas, as will be explained more fully hereinafter.

To cool the liquid contents **34** in the container, one takes a cartridge **36** similar in size and construction to the type of CO_2 cartridges used for carbonating water in home dispensers or charging a gas operated pellet gun (but which may be filled with any liquid cryogenic gas such as liquid nitrous oxide), and inserts the cartridge neck **37** into the depression **28** in the cover of the can. The barb **38** pierces the cap on the cartridge and allows the liquid to expand and flow through the opening in the piercing means and through the passageway defined in part by the tubing **18**, whereby a rapid cooling of the contents of the container takes place.

In the presently preferred form of the invention illustrated in FIGURES 4 and 5, the gasket **29** is resilient and of a thickness greater than the length of the barb **38**. Thus as one inserts the cartridge a temporary seal is formed between the top of the cartridge and the bottom of the gasket before contact takes place between the tip of the barb and the cartridge. FIGURE 5 illustrates that by the time the sealed end of the cartridge actually is ruptured, the gasket is firmly compressed and prevents leakage and consequent waste of the gas. This also obviates any danger of injury to the user due to "blow-back" of the liquid against the user's fingers.

Using liquid nitrous oxide I have found it to be important to allow an unrestricted flow of the N_2O for as great a distance as possible when it first enters the tubing, in order to avoid (on occasion) "ice" formation on the inside of the tubing which tends to block the passageway, thus retarding or preventing one from achieving the desired cooling effect. Therefore in the preferred form illustrated, the tubing **18** from the entry port **25** to the first convolution in the tubing, is essentially straight and free of constriction or convolutions substantially for the maximum distance possible in relation to the height of the container.

I claim:

1. A hermetically sealed container containing a potable beverage therein, one end of said container having fixed therein an entry port and an exit port, said entry port being in the form of a cylindrical depression adapted to receive the sealed mouth and neck of a cartridge containing a cryogenic material, the bottom of said depression having fixed therein piercing means formed from a circular metallic disk having a V-shaped barb punched therefrom and extending perpendicular from the plane of said disk, said ports being connected by a sealed continuous partially convolute passageway for conducting a cooling medium through said beverage, said passageway being defined by a material which is a good heat conductor, and said piercing means having thereover a resilient ring-shaped gasketing material.

2. A hermetically sealed container containing a potable beverage therein, one end of said container having fixed

therein an entry port and an exit port, said entry port being in the form of a cylindrical depression adapted to receive the sealed mouth and neck of a cartridge containing a cryogenic material, the bottom of said depression having fixed therein piercing means for opening the said sealed mouth and said piercing means having thereover a resilient ring-shaped gasketing material, said ports being connected by a sealed continuous partially convolute passageway for conducting a cooling medium through said beverage, said passageway being defined by a material which is a good heat conductor and said passageway, from the entry port to the first convolution, being essentially straight and free of convolution for a

maximum distance in relation to the height of said container.

3. A container according to claim **1** in which said passageway from the entry port to the first convolution is essentially straight and free of convolution for a maximum distance in relation to the height of said container.

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WILLIAM J. WYE, *Primary Examiner.*