May 23, 1967 G. J. WHALEN 3,320,767

SELF-CHILLING DISPOSABLE CONTAINER

Filed Sept. 23, 1965 3 Sheets-Sheet 1

FIG. 1

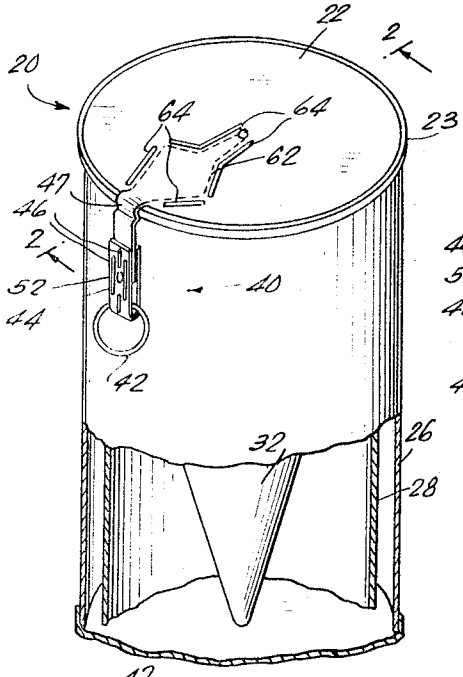
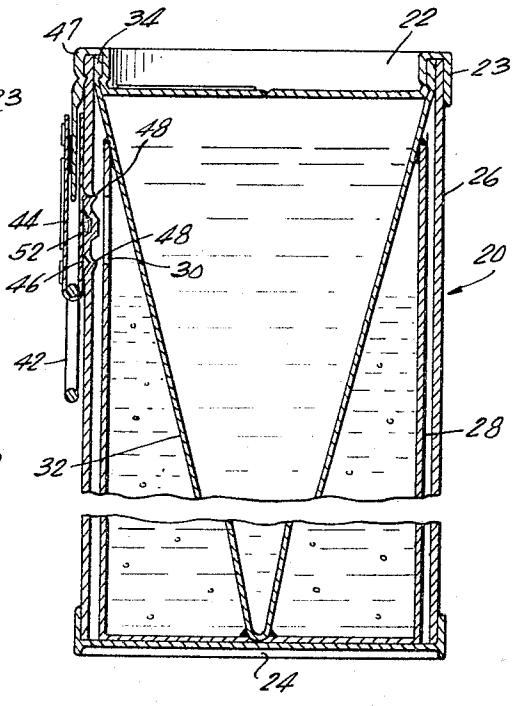


FIG. 2



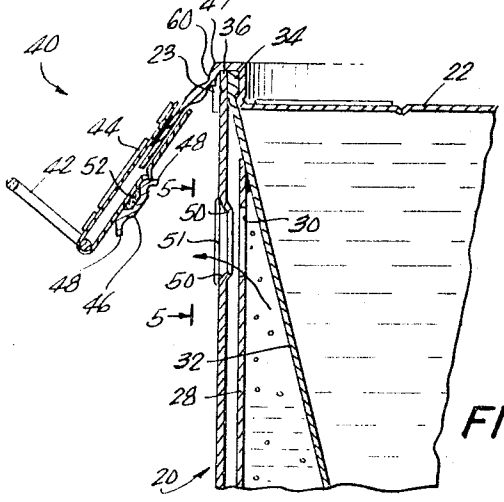


FIG. 3

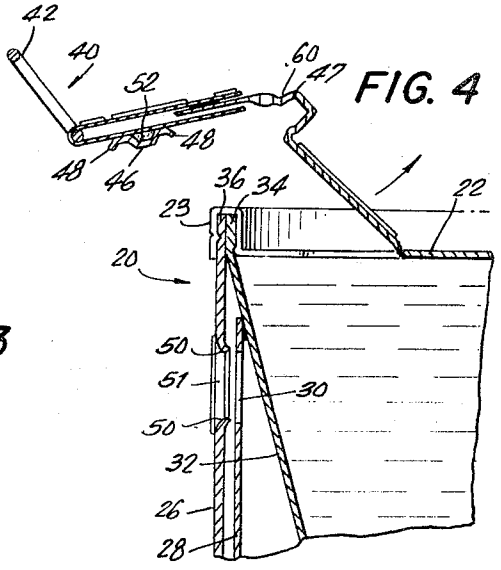


FIG. 4

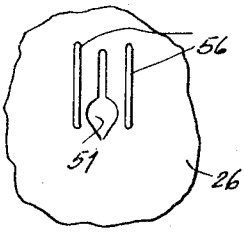


FIG. 5

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SELF-CHILLING DISPOSABLE CONTAINER

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FIG. 6

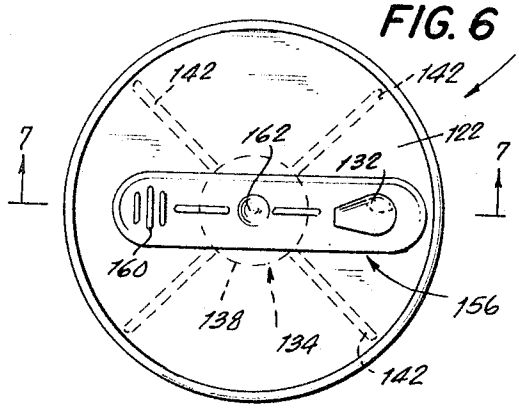


FIG. 7

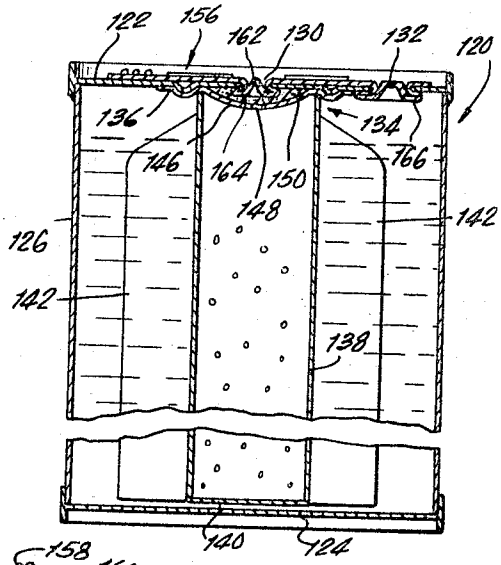
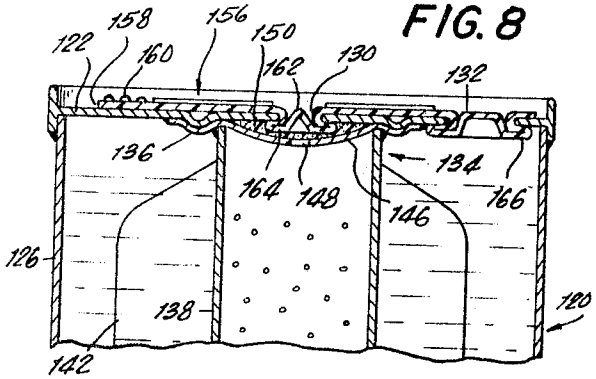
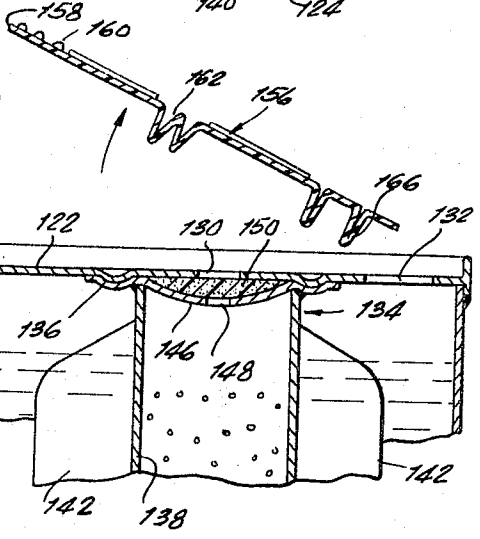


FIG. 8





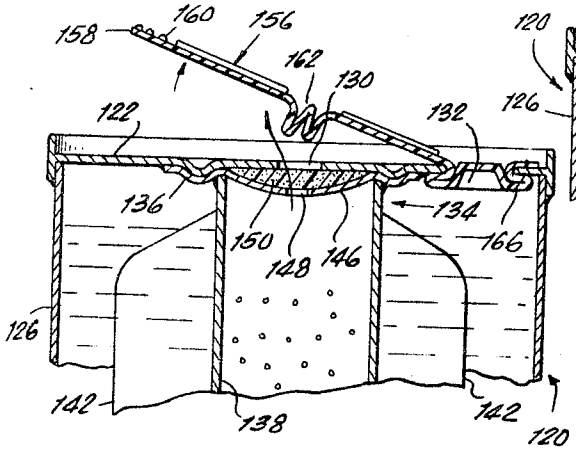


FIG. 10

FIG. 9

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FIG. 11

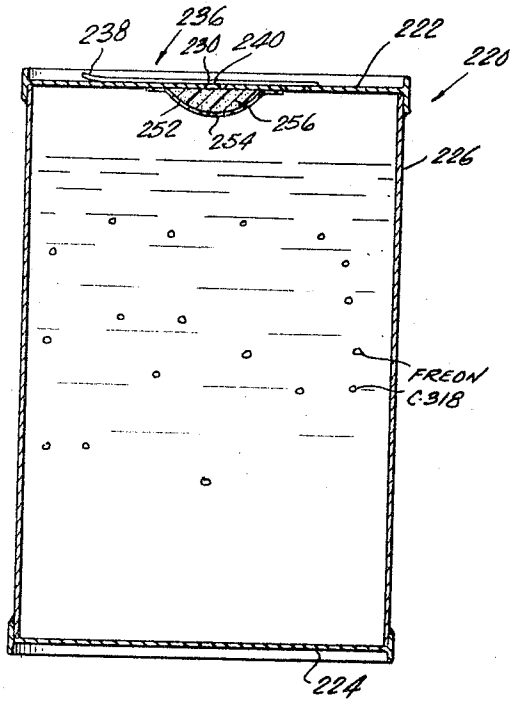
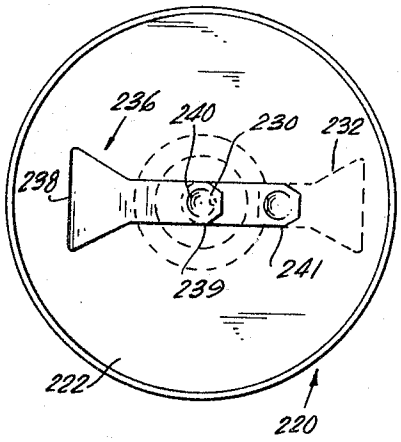


FIG. 12



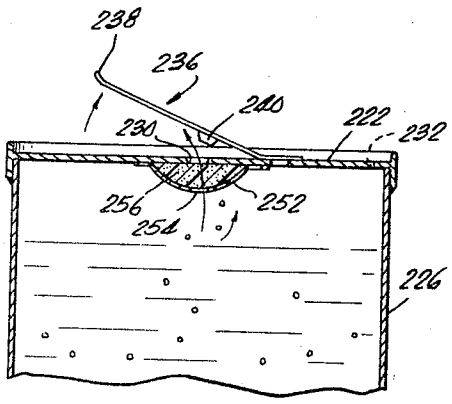


FIG. 13

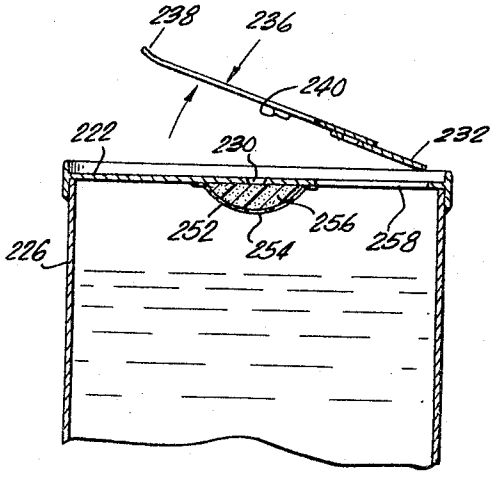


FIG. 14

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SELF-CHILLING DISPOSABLE CONTAINER

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5 Claims. (Cl. 62—294)

This invention relates generally to disposable beverage containers or the like and more particularly to a self-chilling disposable refrigerating container suitable for packaging beverages, fluids or other materials which should be chilled prior to consumption.

Many items of foodstuffs such as beer, soda, fruit juices and the like should be served chilled, which chilling has always presented a problem to the sportsman and outdoor enthusiast in that adequate chilling facilities are not usually available. In an attempt to meet this need, numerous devices such as portable coolers, refrigerable ice packs and the like have been developed and marketed. These devices have certain drawbacks in that they are large, heavy and bulky and require substantial preparation prior to use. The commercially available coolers must be filled with ice, Dry Ice, or other substances which will serve as refrigerants for the coolers. The coolers themselves are of a fairly large size so as to have room for the items of consumption and the refrigerant and when so packed, are heavy and difficult to handle. Further, the refrigerant used for these coolers will be effective for only a short period of time after which it will melt or evaporate, leaving the container full of water or other residue.

After the refrigerant melts or evaporates, the cooler no longer serves any useful purpose and still must be carried, since the cost of the cooler prevents its disposal.

Accordingly, it is an object of my invention to provide a self-chilling disposable refrigerating container.

Further, it is an object of this invention to provide a self-chilling disposable refrigerating container for liquids and the like, which is small in size, light in weight, and which requires no prior refrigeration.

Further, it is an object of the present invention to provide a self-chilling disposable refrigerating container for beverages and the like having a novel opening device which will enable a user to actuate the chillant and to open the beverage container without the use of any tools or other equipment.

Still further, it is an object of this invention to provide a self-chilling disposable refrigerating container having inner and outer containers positively preventing any comingling of the contents of the respective containers.

Further, it is an object of this invention to provide a self-chilling disposable beverage refrigerating container wherein the beverage and the refrigerant may be packed in the same container and comingled.

A further object of this invention is to provide a self-chilling disposable refrigerating container having a uniquely shaped beverage containing container located within a standard commercially shaped outer can.

Further, it is an object of this invention to provide a self-chilling disposable refrigerating container which will be provided with self-opening means thereon which container will be easy to open and use and will be inexpensive to manufacture.

Still further objects, features and advantages of this invention reside in the provision of a self-chilling disposable refrigerating container, capable of being manufactured by mass production methods at a relatively low cost so as to permit wide use and distribution.

Further, it is an object of this invention to provide a self-chilling disposable beverage container having a novel opening device having the facility for opening two separate holes in the lid at different times utilizing the same opening device which opening device is an integral part of the container.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this self-chilling disposable refrigerating container, preferred embodiments of which have been illustrated in the accompanying drawings, by way of example only, wherein:

FIG. 1 is a perspective view of an embodiment of the present invention in a self-chilling disposable refrigerating container, with a portion broken away showing details of the interior construction;

FIG. 2 is a vertical sectional view taken along the plane of line 2—2 in FIG. 1 illustrating in an enlarged scale, the construction of the various components of this embodiment of the invention;

FIG. 3 is a partial sectional view of the self-chilling disposable refrigerating container illustrated in FIG. 2 showing the first step when opening the container;

FIG. 4 is a partial sectional view of the self-chilling disposable refrigerating container showing a further stage on the opening of the container;

FIG. 5 is, looking in the direction of arrows 5—5 in FIG. 3, a detail view in elevation of the key way and air exchange passage in the side wall of the outer container;

FIG. 6 is a top plan view of another embodiment of the present invention showing a modification of the opening device;

FIG. 7 is a vertical sectional view taken along the plane of line 7—7 in FIG. 6;

FIG. 8 is a partial sectional view on an enlarged scale of the self-chilling disposable refrigerating container illustrated in FIG. 7 particularly showing the opening device;

FIG. 9 is a partial sectional detail view on an enlarged scale of the self-chilling disposable refrigerating container illustrated in FIG. 7 showing the first step in opening the container;

FIG. 10 is a partial sectional detail view on an enlarged scale of the self-chilling disposable refrigerating container illustrated in FIG. 7 showing the opened container;

FIG. 11 is a vertical sectional view showing a further embodiment of this invention;

FIG. 12 is a top plan view of this embodiment of the invention particularly illustrating the opening device;

FIG. 13 is a detail sectional view illustrating the opening device partially removed from the self-chilling disposable refrigerating container; and,

FIG. 14 is a sectional view of the self-chilling disposable refrigerating container with the opening device fully removed from the container with the container ready for use.

With continuing reference to the accompanying drawings where like reference numerals designate similar parts throughout the various views, reference numeral **20** generally designates a first embodiment of the self-chilling disposable refrigerating container in accordance with the concepts of the present invention. The outer container **20** is generally cylindrical and is provided with a top **22**, a bottom **24** and a cylindrical side wall **26**. A cylindrical sheath **28** is formed within the outer can **20** and has a gas exhaust aperture **30** formed therein. A cone shaped beverage receptacle **32** is located inwardly of the cylindrical sheath **28** and is sealed with the beverage therein so as to prevent any intermingling of the beverage contained in the cone-shaped receptacle **32** with the coolant. Further, the inner wall of the receptacle **32** may be treated by lining the same with a plastic or other coating mate-

ial so as to prevent chemical interaction between the beverage and the receptacle.

The seal 23 formed at the edge of the top 22 serves multiple purposes, namely, securing the solder bonded edge 34 of the cone 32 and solder bonded edge 36 of the cylindrical sheath 28 to the side wall 26 and further to form a gas tight seal at said juncture preventing the escape of any gas or beverage, while at the same time providing means for capping the receptacle 32 thereby enabling a vacuum sealing of the beverage or the like within the receptacle 32 with the resultant preservation of the contents of the receptacle.

The can 20 is further provided with snap-tab opening means generally designated as 40 having a pull-tab ring or finger ring 42, swivelly mounted to a depending pull-tab 44. The pull-tab 44 is formed with a plurality of stress ridges 46 embossed thereon for the purpose of imparting rigidity to the pull-tab 44. Attached to and formed as an integral part of the side wall 26 is a frangible pull-out vent closure 46 having an angularly inwardly extending enlarged peripheral edge 48 which, when in the assembled condition, forming part of the side wall 26 and overlies and extends beyond the inwardly depressed edges 50 of the side wall 26 which form the vent 51. The frangible pull-out 46 is riveted, welded or otherwise secured at 52 to the inner surface of the pull-tab 44. The pull-out 46 is integrally formed with the cylindrical wall 26, which has weakening grooves formed therein.

The area between the cylindrical sheath 28 and the cone-shaped receptacle 32 is filled with an appropriate coolant or refrigerant such as dichlorodifluoro-methane (CCl_2F_2) or like liquid fluoro-carbons in a quantity which will be readily vaporized upon the exposure to air.

Adjacent the opening in the side wall 26 are a number of stress ridges 56 which serve to prevent the side wall 26 from being distorted or pulled out of shape as the pull-out 46 is removed from the container 20.

As the pull-tab ring 42 is pulled outwardly from the side wall 26 of the container, the frangible pull-out 46 is withdrawn from the side wall 26, as is clearly seen in FIG. 3 opening the vent 5.

The refrigeration process which occurs in the self-chilling container is initiated by the removal of the frangible pull-out 46 from the side wall 26 opening the calibrated vent 51 in the side wall 26 and the sheath 28. The gas under pressure escapes through the vent 51 causing the pressure in the can to drop. As the pressure drops the refrigerant boils vaporizing as a gas which is exhausted through the vent 51. During the vaporization process, the gas absorbs heat thereby, chilling the contents of the receptacle. During the vaporization and chilling process a slight swirling motion of the beverage within the cone is established due to the shape of the cone, causing warmer portions of the beverage to come into contact with the colder surfaces of the cone, thereby chilling the beverage uniformly.

After the chilling has been completed and the vaporization of the gas has ceased, the pull-tab 44 is further raised toward a horizontal position. As this is accomplished the crimped edge 60 of the pull-tab arm 47 separates from the rim 23 and as further upward force is applied, a section of the top 22 is lifted out opening an access or puring hole 61 in the top 22 directly into the cone-shaped receptacle 28. Opening the access hole is facilitated by prior scoring 62 of the top 22, as is shown in FIG. 1. Adjacent the scoring 62 in the top 22 are stress ridges 64 which serve to prevent distortion of the top 22 during the opening of the access hole 61.

Referring now specifically to FIG. 6 through 10, there is illustrated an alternate embodiment of the present invention. Reference numeral 120 generally designates a container having a top 122, a bottom 124 and a side wall 126. The top 122 and the bottom 124 are secured to the side wall 126 by well known means such as soldering, crimping or the like. The top 122 is formed

having a centrally located vent 130 and an access or drinking hole 132 located near the outer periphery of the top 122, which extends toward the central portion of the top.

A finned cylinder 134 having an enlarged top portion 136, a cylindrical side wall 138 and a circular bottom 140 is provided. The cylinder 134 has formed thereon and extending radially outwardly therefrom, a plurality of fins or ribs 142. The ribs or fins 142 may be formed integrally with the cylinder side wall 138 or may be affixed to the side wall 138 of the cylinder 134 by known fastening techniques such as soldering, welding or the like. The finned cylinder 134 with the top portion 136 is affixed to the top 122 in a location spaced directly below and in alignment with the vent 130 in the top 122. The enlarged top portion 136 of the finned cylinder 134 is formal having a downwardly depressed central liner portion 146 provided with a central aperture 148 which is spaced from and in alignment with the vent 130 in the top 122. The area between the top 122 and the depressed central liner portion 146 of the cylinder top 136 is filled with a porous foam material 150 such as polyurethane or the like. The purpose of the polyurethane foam 150 will become evident as this specification continues.

A snap-tab opening means generally designated as 156 is provided which may be formed of a plastic such as polyvinyl chloride or other like substance having a free end 158 with a plurality of ridges 160 thereon to insure a better grip. The snap-tab opening means 156 is secured to the top 122 by heating and then vacuum drawing the tab through the vent 130 and the access or drinking tube 132. During the assembly of the snap-tab opening means 156 with the top 122 the plastic 162 after having been drawn through the vent 130 is peened over beneath the edges of vent 130 as at 164 to provide an airtight seal (FIGS. 7 and 8). Likewise, plastic material 164 is drawn through the access or drinking hole 132 and is peened over beneath the edges of the access or drinking hole 132 so as to provide an airtight seal for the beverage within the container 120.

The finned cylinder 134 is filled with liquid dichlorodifluoromethane or other liquified gas of a suitable composition as will be readily vaporized upon a reduction in pressure. When the snap-tab 156 is pulled upwardly from the top 122 the plastic 162 is withdrawn from the vent 130 thereby reducing the pressure in the finned cylinder 134 and causing the refrigerant (dichlorodifluoromethane) to vaporize thereby reducing the temperature in the cylinder 134 and on the fins 142 so as to cool the beverage within the container. The polyurethane foam 150 serves to regulate the rate of vaporization.

After the refrigerant has been completely vaporized and the beverage has been cooled, the snap-tab 156 is completely removed thereby opening the access or drinking hole 132 to permit the consumption of the enclosed beverage which has now been sufficiently cooled to make the same palatable.

Referring now specifically to FIGS. 11 through 14, there is illustrated a third embodiment of the present invention. In this embodiment reference numeral 220 generally designates the container having a top 222, a bottom 224 and a side wall 226. The top 222 is formed with a centrally located vent 230 and has score lines 232 located near the outer periphery of the top 222. The top 222 and the bottom 224 are secured to the side wall 226 by well known means such as soldering crimping or the like.

Located on the upper surface of the top 222 is a snap-tab 236 which may be formed of a plastic such as polyvinylchloride or the like or of any other suitable material. The snap-tab is provided with a free end 138 which may be upwardly raised from the main portion of the top 222. As the snap-tab 236 is pulled upwardly from the top 222 the snap seal 240 is withdrawn from the vent 230 opening the top thereby reducing the pressure and causing the consumable refrigerant to volatize and leave the container

220. During the vaporization of the refrigerant the beverage in the container **220** is cooled. A downwardly depressed central portion **252** having a central aperture **254** is in alignment with the vent **230** in the top **222** and is affixed to the tops **222**. The area between the top **222** and the depressed central portion **252** is filled with a porous foam material **256** such as polyurethane or the like. The foam material **256** prevents the liquid refrigerant and the beverage from spilling out of the container **220** through the vent **230** during the refrigeration process. Snap tab **238** is welded to the top lid **222** adjacent vent hole **230** at **239** and is further welded to lid **222** to open the access hole **232** by a weld at **241**.

After the refrigeration process has been completed the snap-tab **236** is then fully removed from the upper lid leaving an access or drinking hole **258** in the lid **222**.

A latitude of modification, change and substitution is intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

I claim:

1. A self-chilling disposable refrigerating container comprising a top, a bottom, and side walls, said top having a vent therein, vent closure means for closing said vent integrally formed with said top, said top having an access hole therein extending inwardly from the peripheral edge thereof, a frangible access closure for closing said access hole integrally formed with said top, and opening means connected to said vent closure and said access closure for successively opening said vent and then said access hole upon removal of said opening means from said container, a concave downwardly depressed central liner secured to said top surrounding said vent and spaced therefrom, said central liner having a central aperture therein spaced from and in alignment with said vent, and porous foam material disposed between said top and said central liner.

2. A container according to claim **1** including a finned cylinder affixed to said top below said liner and spaced from said side walls, said finned cylinder being filled with dichlorodifluoromethane, said cylinder being closed by said vent closure.

3. A container according to claim **1**, wherein said cylinder is filled with dichlorodifluoromethane under pressure so that said dichlorodifluoromethane will vaporize upon removal of said vent closure thereby chilling the contents of said container of said vent closure thereby chilling the contents of said container located between said cylinder and said side wall.

4. A self-chilling disposable refrigerating package comprising a container including a top, a bottom, and side walls, said container having a vent on the side wall thereof, vent closure means for closing said vent integrally formed with said container, said container having an access hole therein extending inwardly from the peripheral edge of said top, a frangible access closure for closing said access hole integrally formed with said top, and opening means connected to said vent closure and said access closure for successively opening said vent and then said access hole upon removal of said opening means from said container, a cone-shaped beverage containing receptacle located inwardly of said side walls, said receptacle being sealed at its upper end by said top, evaporable cooling means filling the area between said side walls and said beverage receptacle under pressure so that upon removal of said vent closure means said cooling means will vaporizer chilling the beverage in said receptacle, a cylindrical sheath between said side wall and said cone shaped beverage receptacle, said cylindrical sheath secured to said bottom wall and said cone shaped beverage receptacle at a point spaced from the top of said receptacle, said sheath having a vent hole in alignment with said vent in said side wall, said sheath being disposed in spaced relation to said side wall.

5. A self-chilling disposable refrigerating container comprising a top, a bottom, and side walls, said container having a vent therein, vent closure means for closing said vent integrally formed with said container, said container having an access hole therein extending inwardly from the peripheral edge of said top, a frangible access closure for closing said access hole integrally formed with said top, an interior liner within said container, said liner having an aperture therein spaced from and in alignment with said vent, and opening connected to said vent closure and said access closure for successively opening said vent and then said access hole upon removal of said opening means from said container.

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