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3,309,890

REFRIGERATED DISPOSABLE CONTAINER

Filed March 15, 1965

2 Sheets-Sheet 1

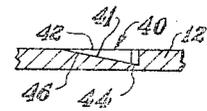
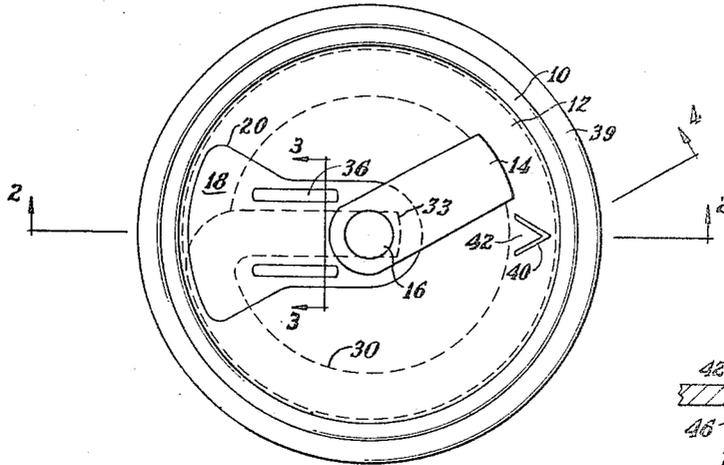


Fig. 4

Fig. 1

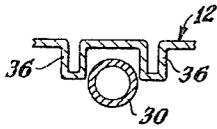


Fig. 3

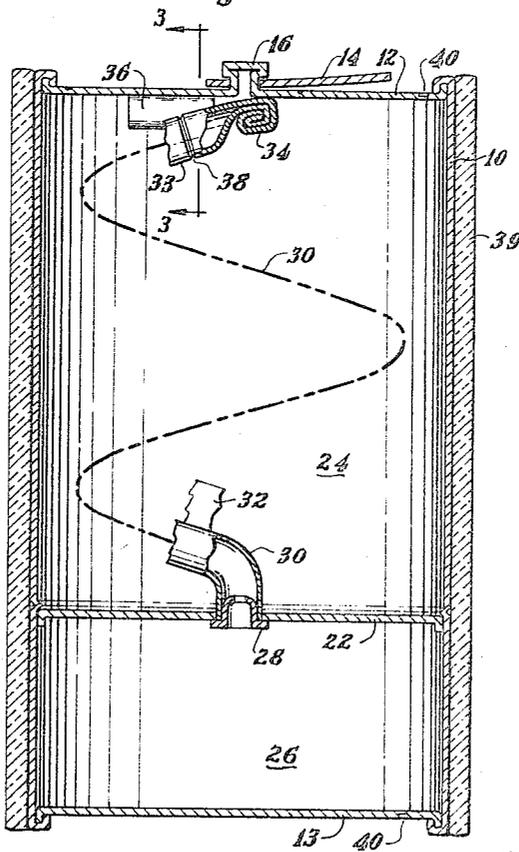


Fig. 2

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2 Sheets-Sheet 2

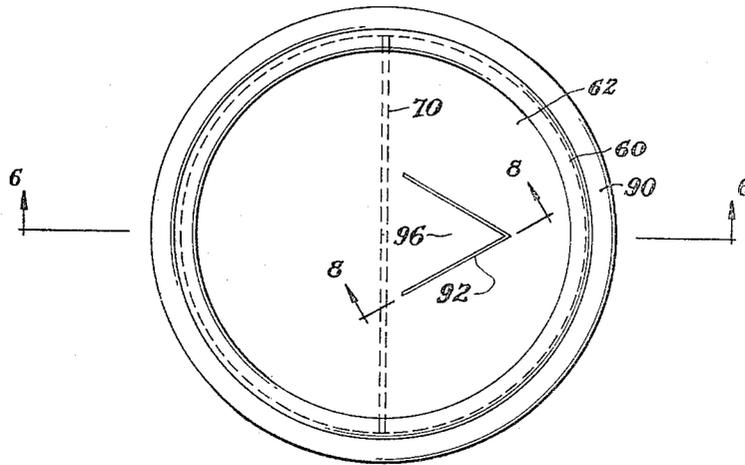


Fig. 5

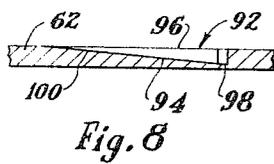


Fig. 8

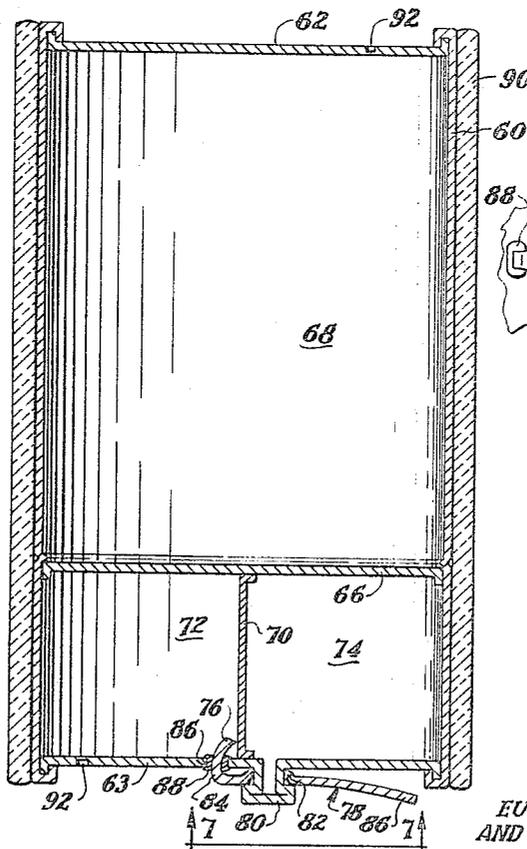


Fig. 6

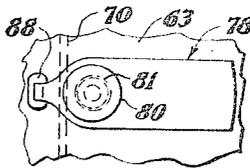


Fig. 7

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REFRIGERATED DISPOSABLE CONTAINER

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This invention relates to containers, and more particularly to disposable containers.

Concepts of the present invention provide a novel disposable container having self-contained means for changing the temperature of the contents thereof.

More specifically, the present invention provides a novel disposable container having in one embodiment, self-contained means for lowering the temperature of the contents, and having, in another embodiment, self-contained means for raising the temperature of the contents.

Other concepts provide a novel and economical safety means for containers, whereby if pressure should start to build up, a controlled yielding of the container is provided to permit pressure to be vented before pressure attains an undesired value.

Although the invention provides temperature-controlling containers which are economical enough as to be disposable, it is not supposed that these containers will be as inexpensive or in as general a use as disposable containers requiring auxiliary refrigeration or heating; rather, the utility and desirability of containers according to this invention are primarily for use-situations where substantially instant temperature change, or the lack of convenient auxiliary cooling or heating equipment, justifies their use. Thus, the containers are of particular advantage to sportsmen, travellers, Armed Forces personnel, and out-door and other such uses.

The above description is quite general and introductory; more specific details, components, and concepts of the overall invention appear in the following detailed description of illustrative embodiments thereof, taken in conjunction with the accompanying generally diagrammatic drawings, in which:

FIG. 1 is a top view of a disposable container according to a first embodiment of the invention, providing self-contained means for cooling the contents;

FIG. 2 is a vertical cross-sectional view of the device shown in FIG. 1, taken generally along section-line 2—2 of FIG. 1;

FIG. 3 is a fragmental cross-sectional detail view, taken generally along section-lines 3—3 of FIGS. 1 and 2, illustrating guide ribs;

FIG. 4 is a fragmental cross-sectional detail view in enlarged scale, taken generally along section-line 4 of FIG. 1, illustrating safety means;

FIG. 5 is a top view of a disposable container according to a second embodiment of the invention, providing self-contained means for heating the contents;

FIG. 6 is a vertical cross-sectional view of the device shown in FIG. 5, taken generally along section-line 6—6 of FIG. 5;

FIG. 7 is a bottom detail view, taken generally along view-line 7—7 of FIG. 6; and

FIG. 8 is a fragmental cross-sectional detail view, in enlarged scale, taken generally along section-line 8—8 of FIG. 7.

As shown in FIGS. 1 and 2, a device according to the first embodiment generally comprises a shell or casing 10 having a top 12 and a bottom 13. The container shown is of a self-openable type, having a pull-tab 14 held by an eyelet 16 integrally formed from the can-top

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12, by which a top-portion 18 may be removed along score-line 20.

According to concepts of the invention, the casing 10 is provided, above the bottom 13, with a partition 22, defining between it and the can-top 12 an upper chamber 24 within which the can contents are placed, and defining between partition 22 and the can-bottom 13 a lower chamber 26 within which a refrigerant liquid is contained under pressure.

An expansion valve 28, opening upwardly, is carried by the partition 22, and from the expansion valve 28 there extends a tube 30 upwardly into the chamber 24. The double advantage, of increased surface area and a spring-type compression (for an access purpose yet to be described) is obtained by disposing the tube 30 in the form of a spiral diagrammatically illustrated. Further increase of surface area is achieved by heat-conductive sheeting 32 operatively attached to the tube 30.

The upper end 33 of tube 30 is closed as by crimping

34. Positioning of the upper portion of the tube 30, generally in registry with the tip-opening at 18, is aided by ribs 36 shown downwardly struck integrally from the can-top 12.

The tube 30 is of a length, and its installation is of a compressing nature, such that when the top-portion 12 of the can is removed, the top portion 33 of tube 30 pushes upwardly through the can-top opening at 18. The user then grasps the tube end-portion 33, and opens the tube 30 to atmospheric pressure by breaking tube-end 33 at the score-line 38.

This exposure of the tube 30 to the lower pressure than in chamber 26 causes the refrigerant liquid to move through expansion valve 28 and tube 30, the refrigeration effect thereby obtained cooling the can contents in the chamber 24.

An insulating sleeve 39 is shown fitted around the casing 10.

The can-top panel 12 and can-bottom panel 13 are shown as provided with economical pressure-release means shown at 40 (FIG. 4). As shown, this comprises the can-panel being formed with a scoring 41 which is in the form of a bight (here shown as V-shaped) which provides a peninsular tab 42 of the can-panel; and the scoring cut is such that the apex of the bight is cut the most (44), the cut then shown as tapering gradually (46) toward the ends of the bight.

This scoring 40 provides a controlled venting of excess pressure; for the tapered scoring provides that the tab 42 will open gradually, the most-cut (weaker) portion 44 breaking open first, permitting some of the pressure to vent before less-cut (stronger) portion 46 breaks open.

A second embodiment (FIGS. 5 and 6) illustrates a device generally comprising a shell or casing 60 having a top 62 and a bottom 63.

According to concepts of this embodiment of the invention, the casing 60 is provided, above the bottom 63, with a partition 66, defining between it and the can-top 62 an upper chamber 68 within which the can contents are placed; and between partition 66 and the bottom can-panel 63 there is a vertically-extending panel 70, defining spaced chambers 72 and 74 within which are contained substances having a thermal effect when permitted to come into operative contact, heating or cooling depending upon the substances or chemical used.

The partition 70 may be fractured by a pointed tip 76 provided on a manually operable lever 78 shown generally similar to a lever of a self-opening can (see lever 14 of FIGS. 1 and 2) held to bottom panel 63 by an eyelet 80 integrally formed from panel 63, and extending

through an opening 81 of said lever. The lever 78, in the region of eyelet 80, is shown provided with a boss 82 which provides a fulcrum; and the end 84 of lever 78, opposite the lever-handle 86, is shown as curved inwardly of the can-bottom 63, passing through a hole 86 therein, to provide the point 76 which faces the partition 70. Sealing material 88 seals the hole 86 but permits the lever-portion 84 to move relative thereto.

Thus, to fracture partition 70, the user grasps lever 78 by its handle 86, pulls handle 86 away from the can-panel 63, rocking lever 78 about fulcrum 82, and causing lever-point 76 to pierce the partition 70. The resulting mixture of the substances of chambers 72 and 74, through the opening provided by the piercing of lever-point 76 through partition 70, provides the thermal change desired.

An insulating sleeve 90 is shown fitted around the casing 60.

The can-top panel 62 and can-bottom panel 63 are shown as provided with economical pressure-release means shown at 92 (FIG. 8). As shown, this comprises the can-panel being formed with scoring 94 which is in the form of a bight (here shown as V-shape) which provides a peninsular tab 96 of the can-panel; and the scoring cut is such that the apex of the bight is cut the most (98), the cut then shown as tapering gradually (100) toward the ends of the bight.

This scoring 92 provides a controlled venting of excess pressure; for the tapered scoring provides that the tab 96 will open gradually, the most-cut (weaker) portion 98 breaking open first, permitting some of the pressure to vent before the less-cut (stronger) portion 100 breaks open.

It is thus seen that a disposable container according to concepts of the present invention provides novel and advantageous concepts and features, providing a disposable container having means for changing the temperature of the contents thereof.

Accordingly, it will thus be seen from the foregoing description of the invention according to these illustrative embodiments, considered with the accompanying drawings, that the present invention provides a new and useful disposable container, having desired advantages and characteristics, and accomplishing its intended objects, including those hereinbefore pointed out and others which are inherent in the invention.

Modifications and variations may be effected without departing from the scope of the novel concepts of the invention; accordingly, the invention is not limited to the specific form or arrangement of parts herein described or shown.

What is claimed is:

1. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing having a top panel and a bottom panel;
- a partition, defining between it and the casing-top an upper chamber within which the container contents are placed, and defining between the partition and the casing-bottom a lower chamber for containing refrigerant fluid under pressure;
- a tube extending upwardly from the partition, the tube bore communicating with the refrigerant chamber but not the container-contents chamber;
- an expansion valve for co-operating with the other parts and the refrigerant fluid to cool the refrigerant fluid flowing into the tube;
- the tube extending upwardly to a closed terminus adjacent the casing-top;
- means providing for opening of the said closed tube-terminus to permit the refrigerant to flow through the said tube;
- the tube being under compression between the top panel and the partition and providing that the tube will be moved upwardly for convenient grasp by the user upon the casing-top being opened.

2. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing having a top panel and a bottom panel;
- a partition, defining between it and the casing-top an upper chamber within which the container contents are placed, and defining between the partition and the casing-bottom a lower chamber for containing refrigerant fluid under pressure;
- a tube extending upwardly from the partition, the tube bore communicating with the refrigerant chamber but not the container-contents chamber;
- an expansion valve for co-operating with the other parts and the refrigerant fluid to cool the refrigerant fluid flowing into the tube;
- the tube extending upwardly to a closed terminus adjacent the casing-top;
- means providing for opening of the said closed tube-terminus to permit the refrigerant to flow through the said tube.

3. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing having a pair of panels defining a chamber in which the container contents are disposed;
- a tube contained in said chamber, and operatively extending from one panel to the other;
- a reservoir for pressurized refrigerant fluid and means providing a cooling effect thereof as the refrigerant fluid passes into the tube;
- the portion of the tube remote from the refrigerant reservoir being closed;
- the said other panel being of the type having a specific opening location;
- said other panel being provided with ribs integrally struck from said panel and extending into said chamber to position the tube in the region of said opening location.

4. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing having a pair of panels defining a chamber in which the container contents are disposed;
- a tube contained in said chamber, and operatively extending from one panel to the other;
- a reservoir for pressurized refrigerant fluid and means providing a cooling effect thereof as the refrigerant fluid passes into the tube;
- the portion of the tube remote from the refrigerant reservoir being closed;
- the tube being provided with metallic stripping to increase heat-transmission operativity.

5. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing having a pair of panels defining a chamber in which the container contents are disposed;
- a tube contained in said chamber, and operatively extending from one panel to the other;
- a reservoir for pressurized refrigerant fluid and means providing a cooling effect thereof as the refrigerant fluid passes into the tube;
- the portion of the tube remote from the refrigerant reservoir being closed.

6. A disposable container having self-contained means for changing the temperature of the contents thereof, comprising:

- a casing;
- a reservoir for refrigerant fluid under pressure;
- a tube extending from said reservoir through the interior of said casing;
- means closing the end of the tube at a location remote from said reservoir, but openable to permit refrigerant fluid to move through said tube to cool the contents of said casing.

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