ENDOTHERMIC BEVERAGE COOLER

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ABSTRACT

The invention includes a system and method for cooling a plurality of containers. Preferably, the apparatus and method comprise a plurality of compartments operable to receive and retain the plurality of containers. Further, a liner is provided that is in operative engagement with at least two of the compartments. The liner is provided with chemicals that cause an endothermic reaction to cool the compartments when the chemicals are activated.
ENDOTHERMIC BEVERAGE COOLER

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based on and claims priority to U.S. Provisional Patent Application Ser. No. 60/889,151, filed on Feb. 9, 2007 and entitled ENDOTHERMIC BEVERAGE COOLER, the entire contents of which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to cooling beverage containers.

[0004] 2. Description of the Related Art

[0005] Various implementations for cooling or keeping cold beverage containers, e.g., cans or bottles, are known. Most commonly, people use refrigerators, freezers, ice or ice packs, or the like. Using ice or ice pack over an extended period of time, however, requires a separate insulated unit, such as a cooler, to hold the ice or ice pack to prevent the ice or ice pack from melting.

[0006] Over time, various chemical solutions have been proposed to cool a beverage container without requiring refrigeration or ice. Chemical solutions typically include gas and/or liquid that forms as a result of an endothermic reaction. For example, U.S. Pat. No. 3,636,726 issued to Rosenfeld et al. ("Rosenfeld") is directed to a beverage container that is cooled by a small reservoir of a compressed nontoxic gas or nontoxic liquid in the interior of the beverage. The beverage is rapidly cooled when the gas is allowed to escape from the reservoir through a throttle, the device being generally in the form of a flat plate in the interior of the beverage.

[0007] FIGS. 1A-1E of the drawings illustrate example prior art beverage container holders of the type in which the beverages are shipped and/or sold. The examples shown in FIGS. 1A-1E are constructed of cardboard. Various heights and widths of prior art beverage container holding units 100 are shown in FIG. 1A-FIG. 1E.

[0008] FIG. 1A illustrates an example prior art beverage container holding unit 100 holder for 24 glass bottles 102, such as commonly used for a case of beer. Included in FIG. 1A is a beverage container holding unit 100 are partitions 104 that intersect to form individual cells 106. As known in the art, cells 106 may be relatively small, for example, a cup or less in height, or may be quite tall, for example, six to ten inches tall. The height and width of each cell is independent, in part, upon the size of the respective beverage container 102.

[0009] FIG. 1B illustrates the example prior art beverage container holding unit 100 shown in FIG. 1A with bottles 102 placed therein. FIG. 1C illustrates an alternative prior art beverage container holding unit 100 that holds jugs 102 within partitions 104. FIG. 1D illustrates partitions 104 that form cells 106 and which is operable to be placed with in beverage container holding unit 100 (not shown). FIG. 1E illustrates an example beverage container holding unit 100 formed to hold a six-pack of bottles 102.

[0010] Unfortunately, placing beverage containers 102 in beverage container holding unit 100 does not keep the containers 102 cool or cold. In order to keep a beverage container 102 cool or cold, the user must place the entire beverage container holding unit 100 in a refrigerator or other cooling device, or remove the beverages containers 102 from beverage container holding unit 100 and store the containers 102 directly in a cooling device, such as a refrigerator, beverage cooler or the like.

[0011] Various techniques have been proposed for cooling containers. U.S. Pat. No. 3,726,106 issued to Jaeger ("Jaeger") is directed to a self-heating or cooling container having two separable sections, one for enclosing a cooling or heating chemical and the other for enclosing the product to be cooled or heated. The coolant-heating agent section has a valve assembly that when activated causes the product to change temperature. The separable sections allow forming and filling each section individually during the manufacturing process.

[0012] U.S. Pat. No. 4,784,678 issued to Rudick et al. ("Rudick") is directed to a self-cooling container for the cooling of a beverage by an endothermic chemical reaction as the cooling mechanism. The cooling mechanism, located in an inner chamber within the container, is easily and safely actuated.

[0013] U.S. Pat. No. 4,816,048 issued to Kimmelschue ("Kimmelschue") relates to cooling devices, and more particularly pertains to quickly cooling fluid or solid foodstuffs retained within a container. When a user of the container removes a "pop top," a drinking aperture is formed for access to the retained beverage and additionally, the conduit is exposed whereby the user can manually move an ammonium nitrate holder downwardly within the conduit to effect a rupturing of the membrane. Upon a mixing of the ammonium nitrate with distilled water, an endothermic reaction is created which results in a rapid cooling of the beverage prior to its consumption.

[0014] U.S. Pat. No. 4,993,237 issued to Bond et al. ("Bond") is directed to a self-cooling container in which a segregating wall is used to divide the container into a beverage chamber and a cooling chamber, the latter having a reaction chamber mounted therein, which in a preferred embodiment is of an elongated cylindrical shape. The reaction chamber cylinder of the invention provides an inverted funnel-shaped bottom surface for receiving the flow of beverage from the beverage chamber portion of the container through a feed-through at the bottom of the segregating wall thereof. A reaction chamber houses a combination of chemical materials separated by a readily broken sealing device from a selected volume of distilled water, which released into the chemical constituents, initiates an endothermic reaction which extracts heat from the beverage.

[0015] U.S. Pat. No. 5,109,588 issued to Hewlett ("Hewlett") is directed to an improved multi-layer wrap for keeping a beverage container cool. An insulating blanket is inserted into an outer pocket of the wrap assembly through an entrance opening thereto. An inner pocket has an open end for removably receiving a blanket containing a heat absorbing material. A pocket is constructed so that, upon the application of pressure, it will rupture and the water will intermix with ammonium nitrate pellets that are stored therein. Such mixing will effect an endothermic reaction wherein heat will be absorbed.

[0016] U.S. Pat. No. 5,331,817 issued to Anthony ("Anthony") relates to temperature changing devices and in particular to portable or disposable food or beverage coolers and heaters. A vortex tube is provided which supplies the needed heating or cooling effect to the beverage in the can.

[0017] U.S. Pat. No. 5,947,378 issued to Rebottler ("Rebottler") is directed to a cooling drinking straw. The invention consists of inserting one or several cores in the central straw of a drinking unit, through which the beverage flows to be...
cooled or heated, flows the fluid to be heated or cooled. By altering the flow, the core plus tube system is equivalent to a narrower and longer tube. This allows to manufacture an efficient non-coiled central straw. The straw and core characteristic of the invention can have different shapes. The core needs not have the full length of the straw. In most embodiments the core has no thermal role, but in particular cases it can contribute to the heat or cold storage. Several cores, not necessarily joined, can be used in the same straw. Core and straw or straw only can be bent and shaped in various shapes. The drinking unit can be made of an enclosure containing an active or passive medium delivering cold or heat. The endpieces of the unit can be made to accommodate detachable extensions such as a mouthpiece or a straw extension.

[0018] U.S. Pat. No. 6,701,720 issued to Stone ("Stone") is directed to a sleeve or a wrapper used to keep liquid contained in a container, such as a glass or bottle or can, cool. The sleeve contains materials that generate light when activated and chemicals that absorb heat when combined. The light is generated in an upper portion of the sleeve while heat is absorbed in a lower portion of the sleeve. The sleeve can be re-used by storing the sleeve in a refrigerator or freezer after the initial use which does not require such pre-cooling.

[0019] U.S. Pat. No. 7,117,684 issued to Scudder ("Scudder") relates to a container having a container body, a thermic module at one end of the body, and a closure at the other end of the body. Food, beverage, medicine or other material to be heated or cooled is contained in a material cavity in the container body. The thermic module contains a chemical reactant that is segregated from another reactant in the container. When a user actuates the thermic module, the reactants mix and produce a reaction that, depending upon the reactants, either produces heat, i.e., an exothermic reaction, and thereby heats the container contents, or absorbs heat, i.e., an endothermic reaction, and thereby cools the container contents.

[0020] While the prior art teaches various techniques that may be effective for cooling a single container as a function of a user-controlled endothermic reaction, no unit is taught that is operable to cool a plurality of beverage containers at once. Furthermore, the prior art beverage cooling devices are complicated, which increases manufacturing costs.

SUMMARY

[0021] In one example embodiment, a single unit that is operable to hold a plurality of beverage containers is provided to cool the containers without requiring refrigeration or ice. The unit is preferably complex and made of a relatively inexpensive construction, such as cardboard. The portable unit is disposable following a single use. Alternatively, the unit is recyclable. Alternatively, the beverage container holder may be made of any other suitable material, such as plastic or metal.

[0022] In another example embodiment, an apparatus and method are provided for cooling a plurality of containers that comprises a plurality of compartments operable to receive and retain the plurality of containers. Preferably, a liner is provided that is in operative engagement with at least two of the compartments, wherein the liner is provided with chemicals that cause an endothermic reaction to cool the compartments when the chemicals are activated.

[0023] In another example embodiment, a liner is included with the beverage holding unit that includes one or more chemicals that is/are retained within a barrier within the liner. The chemical, such as ammonium chloride or ammonium nitrate, when mixed with water or other substance, results in an endothermic reaction. In one embodiment, the liner is provided as a self-contained and portable insert to in the art, is provided as a self-contained portable unit and can be inserted in beverage container holding unit, such as a typical cardboard case used for beer or other beverages. In an alternative embodiment, the liner is coupled and fixed to the beverage holding unit and is not provided as a self-contained and separate unit. Preferably, the liner that is provided with cooling chemicals surrounds each container inside the unit. Once the cooling chemicals are activated within the liner, such as causing the ammonium chloride to mix with water, the liner becomes cold. Consequently, the beverage container inside the unit are cooled.

[0024] The liner preferably contains chemicals that are separated by one or more barriers and, when mixed, become cold. Preferably, the activation of the chemicals within the liner may be initiated in various ways. For example, a draw-string is pulled by a user and causes an inner bag within the liner to crack, thereby allowing the chemicals to mix and cool the liner. Alternatively, a dial is attached to one or more wires inside the liner that is used to crack an inner bag of chemicals. In yet another embodiment, a push button is coupled to wires that can be used to cause the inner bag to crack. In still yet another embodiment, a device may be used in which an inner bag or membrane ruptures that results in a mixing of chemicals or contents in the inner bag with chemicals or contents in the outer bag to produce an endothermic reaction. For example, the inner bag or membrane may rupture by a forcible impact, such as by a user squeezing the inner and outer bags together or the like. See, for example, sport or first aid ice packs, including those sold by GOGOODS.COM, INC. of Columbia, Md.

[0025] Preferably, the liner is carried/stored at ambient room temperatures until activation is required. Once the endothermic chemical reaction is initiated, the liquid within the pack is cooled, for example, to five degrees Celsius, and within as little as three seconds. After usage, the pack can be discarded as the chemical contents are preferably biodegradable.

[0026] Preferably, beverage containers of various sizes, such as 8 oz, 12 oz, 16 oz or the like are preferably accommodated by the unit described herein. Further, the unit may hold virtually any number of containers, including a 24-pack (such as a case), an 18-pack, an 12-pack, a 6-pack or the like. Alternatively, the unit holds one single beverage container. This single beverage container embodiment fits snugly around the beverage container, thereby allowing a person to drink or pour from the container while the container remains in the unit.

[0027] Preferably, the unit is adapted to support any sized beverage container, including wine bottles, large water jugs or the like. Further, a handle, rope or string may be provided for carrying purposes.

[0028] In yet another embodiment, the cooling system is adapted for kegs and beer balls. FIG. 2C illustrates an example beer keg 216 that is provided with liner 204. In this alternative embodiment, surrounding tubing may be provided through which a beverage, such as beer, flows. In this alternative embodiment, the cooling system may be provided as a portable unit is provided with a keg, such as near the keg tap or hose through which the flows. The cooling system may be provided to function such that beer flows through tubing.
cooled by liner 204, thereby cooling the beer as it flows out
the tap. In yet another alternative, a tube is provided that is
formatted as a lining which surrounds a beverage ball or keg.
The lining is preferably provided with chemicals operable for
an endothermic chemical reaction that cools the ball or keg.
[0029] In yet another alternative embodiment, the liner
includes in two chambers that are positioned, for example, top
and bottom or side by side. The two chambers are preferably
separated by a perforated midsection that is removable. For
example, a plastic strip, pull cord, or the like is provided with
the perforation that, when removed, causes liner chambers to
breach, effectively causing the liner to become one piece.
This enables a mixing of the cooling chemicals, dry ice tabs-
tlets, or the like, thereby causing the endothermic reaction.
[0030] Other features and advantages of the present inven-
tion will become apparent from the following description that
refers to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] For the purpose of illustration, there is shown in the
drawings a form which is presently preferred, it being under-
stood, however, that the teachings herein are not limited to the
precise arrangements and instrumentalities shown. The fea-
tures and advantages of the teachings herein will become
apparent from the following description that refers to the
accompanying drawings, in which:
[0032] FIGS. 1A-1E illustrate example prior art beverage
container holders;
[0033] FIGS. 2A-2F illustrate example beverage containers
in accordance with example embodiments; and
[0034] FIG. 2G illustrates an example liner in accordance
with a preferred embodiment.

DESCRIPTION OF EMBODIMENTS

[0035] In accordance with the teachings herein, an instant
cooler is preferably provided for containers, such as bottles,
without a need for refrigeration, ice or the like.
[0036] Referring to the drawings, in which like reference
numerals refer to like elements, FIGS. 2A-2F illustrate
example embodiments of the beverage container holding unit
200 in accordance with the teachings herein. As shown in
FIGS. 2A-2F, cells 202 are provided with liner 204, which
includes coolant chemicals, such as ammonium chloride
separated from water as a function of a barrier (not shown),
as known in the art. Preferably, chemicals in liner 204 are ac-
tivated by a user that enable the chemicals to mix and become
cold. For example, one or more wires (not shown) provided
within liner 204 operate to breach the barrier(s) within liner
204, thereby permitting the chemical(s) to mix and to trig-
ger an endothermic reaction. Of course, one skilled in the art
will recognize that alternative features can be provided instead
of wire to cause a breach within the liner's 204 barrier thereby
enabling a mixing of chemicals within the liner 204.
[0037] In a preferred embodiment, liner 204 is provided
within the walls and floor of each cell 106 of beverage con-
tainer holding unit 200.
[0038] Various embodiments shown in FIGS. 2B-2F are
provided with alternative example elements envisioned
herein that enable a user to cause the chemicals in liner 204 to
mix and, accordingly, become cool.
[0039] In the example shown in FIG. 2B, push button 206 is
operable to cause the chemicals within liner 202 to mix. In
one embodiment, when the user pushes button 206, wires or
another feature within liner 204 actuates, thereby causing the
chemicals to mix and the corresponding endothermic reac-
tion.
[0040] In the example shown in FIG. 2C, dial 208 is oper-
able to cause the chemicals within liner 202 to mix. In one
embodiment, when the user turns dial 208, wires or another
feature within liner 204 causes the chemicals to mix. Alter-
natively, dial 204 may be operable with a timing mechanism
(not shown) that can be set by a user to cause the mixing of
chemicals in liner 202 at a predetermined time. For example,
in case a user wishes to have the beverages in beverage con-
tainer 102 to be cooled three hours after a certain time, the
user sets the dial 204 to a value indicating three hours, and
after the expiration of that time, a corresponding mechanism
functions to activate the chemicals, for example, by mixing
them.
[0041] An alternative embodiment is shown in FIG. 2D, in
which a pull string (or, alternatively, cord or the like) is
operated by the user to cause the chemicals within liner 202 to
mix and become cold. For example, by pulling cord 210, the
barriers separating the respective elements (e.g., water and
ammonium chloride) are breached, thereby causing the
endothermic reaction to occur when the chemicals become
activated.
[0042] An alternative embodiment is shown in FIG. 2E, in
which the activating member 212 is operated by the user to
cause the chemicals within liner 202 to mix and become cold.
For example, by actuating member 206, barriers that separate
the respective elements (e.g., water and ammonium chloride)
that, when mixed, become cool.
[0043] In yet another alternative embodiment and shown in
FIG. 2F, pull tab 214 is provided that may include one or more
sharp ends that operate to puncture or otherwise breach the
barriers separating the chemicals. As described above with
respect to button 206, dial 208, cord 210, and member 212,
when pull tab 214 is actuated, the chemicals within liner 204
mix.
[0044] Of course, one skilled in the art will recognize that
other embodiments are envisioned herein, such as those
described and not shown in the corresponding reference fig-
ures. For example, although the embodiment shown in FIGS.
2A-2D include beverage container holding units 200 made
of cardboard, one skilled in the art will recognize that other
materials can be used to fashion beverage container holding
unit 200, including plastic, metal, or other material. In a
preferred embodiment, beverage container holding unit 200
is disposable and/or recyclable, and, therefore, a cardboard is
a preferred material for beverage container holding unit’s 200
construction. In an alternative embodiment, replaceable and
self-contained liners are provided for the beverage container
holding unit 200.
[0045] In yet another embodiment, an agitating member
(not shown) is provided within beverage container holding
unit 200 and operable for initiating or improving mixing of
the respective elements (e.g., water and ammonium chloride).
The agitating member may be provided in various ways. For
example, retractable arms may be provided within beverage
cooling unit 200 that are positioned on respective sidewalls.
When the liner containing chemicals are mixed, the arms of
the agitating member actuate to cause the elements to mix.
Alternatively, the arms of the agitating member cause the
liner to fold, thereby improving the mixing process of the
elements. One skilled in the art will appreciate that alterna-
tive constructions can be applied without departing from the spirit
of the teachings herein. Any mechanical construction that enables the elements within the liner to combine and/or mix is preferably supported by the teachings herein.

Beverage cooling unit 200 provides benefits over prior art devices that require the use of ice or cooled air, such as thermoses and refrigerators. By eliminating a need for ice or cold air, a savings of electricity is realized by the beverage cooling unit 200. Further, prior art beverage containers, such as those made of cardboard, are typically thrown away after bottles are removed therefrom and placed, for example, in refrigerators or coolers. Thus, beverage cooling unit 200 reduces waste by providing instant cooling directly therein, without requiring a user to remove bottles for cooling. Further, users often place bottles in prior art beverage containers directly into a refrigerator or cooler, thereby refrigerating and cooling the cardboard container, in addition to the bottles. Another benefit of beverage cooling unit 200 is that only the bottles in the container 200 are cooled, without a need for cooling the cardboard container, as well.

Thus, beverage cooling unit 200 provides so-called “green” solutions to prior art beverage containers, that are often disposed of after providing a single use of holding a plurality of beverage containers.

Although the present invention is described and shown in relation to particular embodiments thereof, many other variations and modifications and other uses will become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure herein.

What is claimed is:

1. An apparatus for cooling a plurality of containers, the apparatus comprising:
   a plurality of compartments operable to receive and retain the plurality of containers; and
   a liner in operative engagement with at least two of the compartments, wherein the liner is provided with chemicals that cause an endothermic reaction to cool the compartments when the chemicals are activated.

2. The apparatus of claim 1, wherein at least one of the plurality of compartments has at least one wall and a floor, and further wherein the liner is coupled to at least one of the wall and floor.

3. The apparatus of claim 1, wherein the chemicals include at least one selected from the group consisting of ammonium chloride, ammonium nitrate, dry ice and water.

4. The apparatus of claims 1, wherein the liner includes at least one chamber, wherein the at least one chamber contains the chemicals.

5. The apparatus of claim 4, wherein the at least one chamber is separated by a perforated section.

6. The apparatus of claim 5, wherein the perforated section is removable.

7. The apparatus of claim 5, further comprising a tearing member operable to pierce at least one of the at least two chambers.

8. The apparatus of claim 7, wherein the tearing member is at least one selected from the group consisting of a strip and a pull cord.

9. The apparatus of claim 1, further comprising a mixing element in the at least two of the compartments and operable to cause the chemicals to become activated.

10. The apparatus of claim 9, wherein the mixing element is a rigid member.

11. The apparatus of claim 10, wherein the rigid member is at least one selected from the group consisting of wire, a rod, a screw and a nail.

12. The apparatus of claim 9, further comprising an control member and operable to actuate the mixing element.

13. The apparatus of claim 12, wherein the control member is at least one selected from the group consisting of a dial, a pushbutton and a drawstring.

14. The apparatus of claim 12, further comprising a timer control operable to activate the control member after a pre-defined period of time.

15. An apparatus for cooling fluid, the apparatus comprising:
   a storage container containing the liquid; and
   a conduit through which the fluid flows; and
   a liner in operative engagement with at least a portion of the conduit, wherein the liner is provided with chemicals that cause an endothermic reaction to cool the conduit when the chemicals are activated.

16. The apparatus of claim 15, wherein the storage container is a keg.

17. The apparatus of claim 15, wherein the conduit is coupled to a tap.

18. A method for cooling a plurality of containers, the method comprising:
   providing a plurality of compartments operable to receive and retain the plurality of containers; and
   providing a liner in operative engagement with at least two of the compartments, wherein the liner is provided with chemicals that cause an endothermic reaction to cool the compartments when the chemicals are activated.

19. The method of claim 18, wherein at least one of the plurality of compartments is formed with at least one wall and a floor, and further wherein the liner is coupled to at least one of the wall and floor.

20. The method of claim 18, wherein the chemicals include at least one selected from the group consisting of ammonium chloride, ammonium nitrate, dry ice and water.

21. An apparatus for cooling a plurality of containers, the apparatus comprising:
   a plurality of compartments operable to receive and retain the plurality of containers; and
   a cooling mechanism in operative engagement with at least two of the compartments, wherein the cooling mechanism cools the compartments when activated.

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