United States Patent

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[54] **DEVICE FOR COOLING BOTTLED LIQUIDS**
5 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** 62/441, 62/64, 62/514, 62/373, 62/394, 62/273
[51] **Int. Cl.** **F25d 11/02**
[50] **Field of Search** 62/64, 514, 373, 440, 441, 394

[56] **References Cited**

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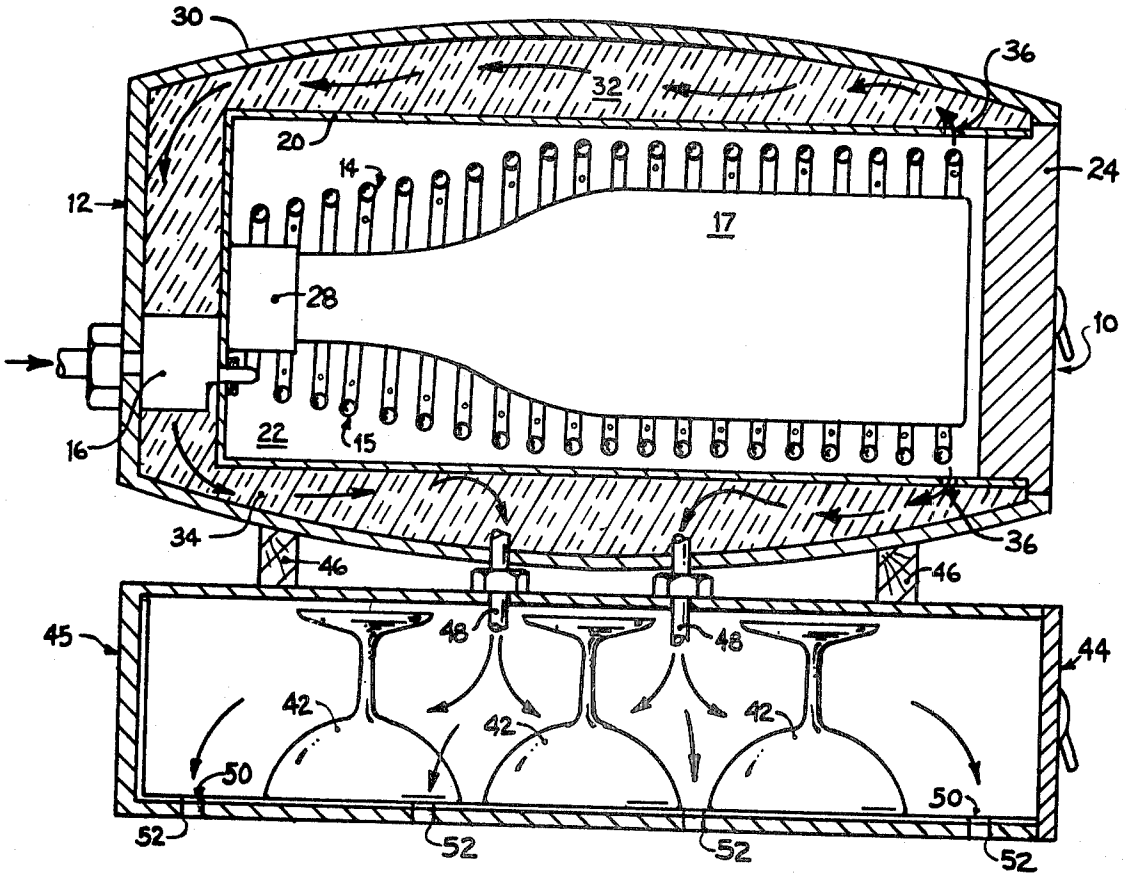
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Attorney—Birch, Swindler, McKie & Beckett

ABSTRACT: A portable device for cooling bottled liquids, such as wine, including a thermally insulated container and a coil of tubing positioned therein within which a liquid-containing bottle is adapted to be placed. The surface of the tubing facing inwardly of the coil has a plurality of perforations therein so that a gaseous refrigerant introduced into the tubing will flow out of the perforations and radially inwardly of the coil against a bottle disposed within the coil.



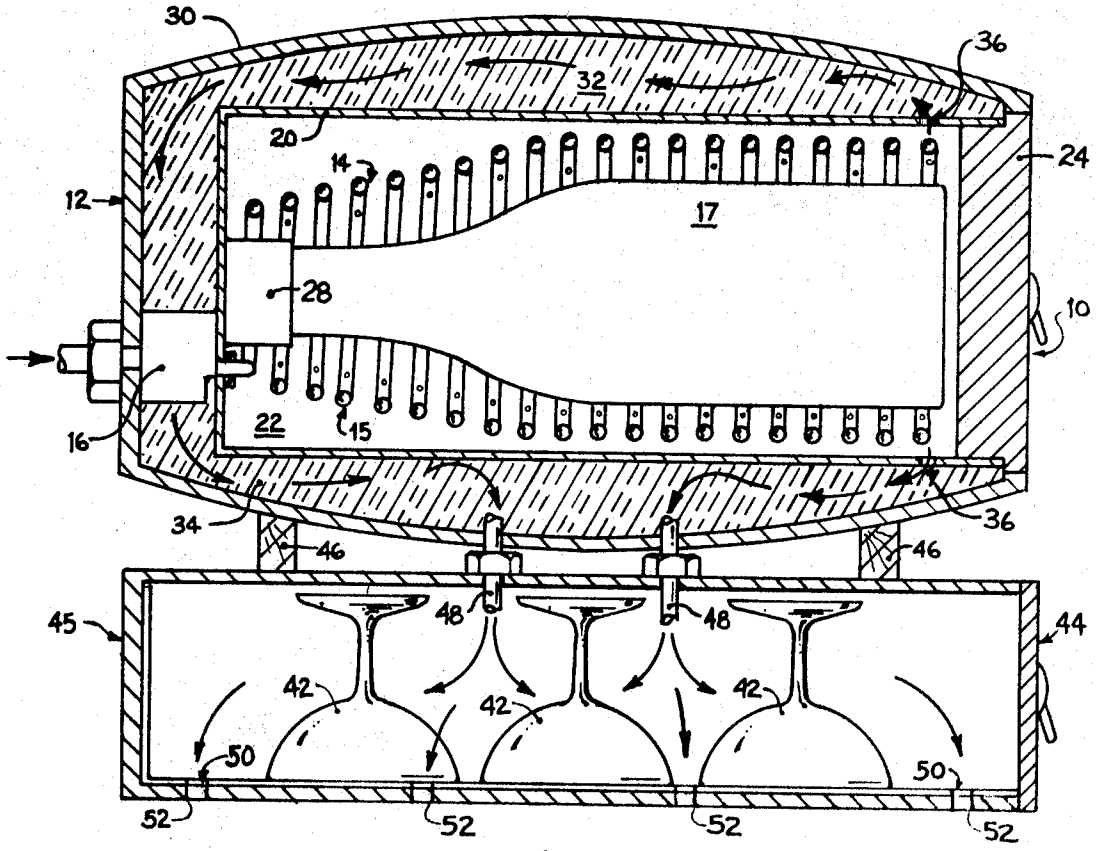


Fig. 2
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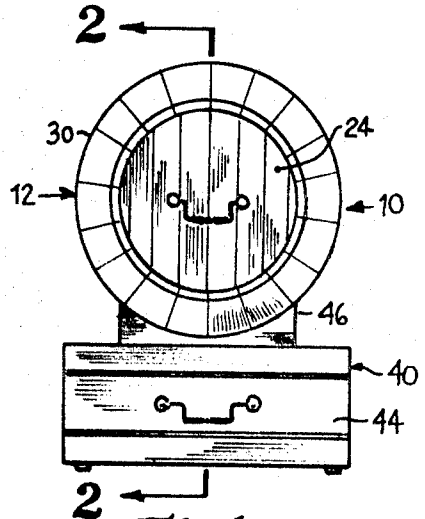


Fig. 1

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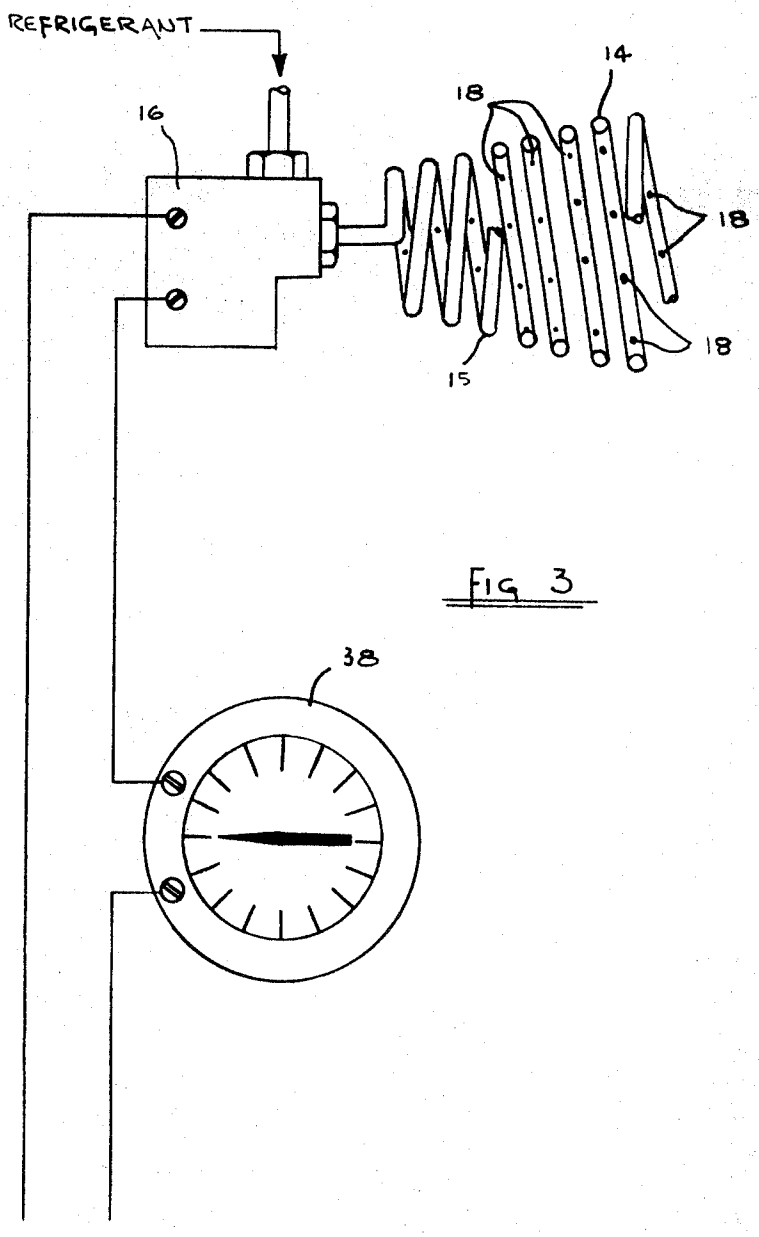


Fig 3

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DEVICE FOR COOLING BOTTLED LIQUIDS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to refrigeration devices, and specifically to a portable device for cooling bottled liquids.

2. Description of the Prior Art

Many refrigeration devices are known for cooling or chilling bottled liquids. Generally, such devices comprise a thermally insulated container and a refrigeration system for lowering the temperature within the container. One type of refrigeration system which has been used in such devices includes a coil of tubing within which a liquid-containing bottle is adapted to be placed and means positioned either internally or externally of the container for passing a refrigerant through the tubing. Another type of refrigeration system which has been used in such devices includes a valved inlet through which a refrigerant is simply introduced into the container.

While refrigeration systems of the foregoing types are operative for the purpose intended, they do not provide an optimum means for cooling a bottled liquid. For example, in systems which include a coil of tubing through which a refrigerant is passed, a rather lengthy period of time is required to adequately cool a liquid contained in a bottle disposed within the coil. In systems which include a valved inlet for introducing a refrigerant directly into a container, the refrigerant is not uniformly directed against all portions of a liquid-containing bottle disposed within the container so that the liquid in the portion of the bottle adjacent the inlet may be rapidly cooled while the liquid in the other portions of the bottle remain relatively uncooled.

SUMMARY OF THE INVENTION

The device of the present invention obviates the foregoing deficiencies by providing a refrigeration system which comprises an optimum means for cooling a bottled liquid. Moreover, the device of the invention is reliable, is economical to manufacture and operate, and may be made in the form of an attraction and unusual furniture piece.

Basically described, the device of the invention comprises; a thermally insulated container; a coil of tubing disposed within the container and adapted to axially surround a liquid-containing bottle, the tubing being closed at one end of the coil, the surface of the tubing facing inwardly of the coil having a plurality of perforations therein; and a valve connected to the tubing at the other end of the coil so that when a source of gaseous refrigerant is connected to the valve and a liquid-containing bottle is disposed within the coil, upon opening of the valve the refrigerant will flow through the tubing, out of the perforations and radially inwardly of the coil against the bottle to cool the liquid contained therein.

The flow of refrigerant against the bottle ensures rapid cooling, while the disposition of the coil about the length of the bottle ensures uniform cooling.

Preferably, the device also includes a second container in which a plurality of drinking glasses may be accommodated, and which is in fluid flow communication with the first-mentioned container so that refrigerant will flow from the first container into the second container to chill the glasses.

With the foregoing in mind, it is an object of the present invention to provide an improved device for cooling bottled liquids.

It is also an object of the invention to provide a device for cooling bottled liquids, which device includes a refrigeration system comprising an optimum means for cooling such liquids.

It is a further object of the invention to provide a device for cooling bottled liquids, which device includes a refrigeration system comprising a coil of tubing having a plurality of perforations in the surface thereof facing inwardly of the coil so that when a gaseous refrigerant is introduced into the tubing, the refrigerant will flow out of the perforations and radially inwardly of the coil against a liquid-containing bottle disposed within the coil.

It is an additional object of the invention to provide a device as described in the preceding object, which device includes a first container within which a bottled liquid may be cooled and a second container within which a plurality of drinking glasses may be chilled.

It is also an object of the invention to provide a device for cooling bottled liquids, which device is reliable, is economical to manufacture and operate, and may be made in a form of a decorative and unusual furniture piece.

These and other objects of the invention will become apparent upon a consideration of the detailed description of a preferred embodiment thereof given in connection with the following drawings, wherein like reference numerals refer to like elements throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an end view of the device of the invention;

FIG. 2 is a sectional view taken on line 2–2 of FIG. 1; and

FIG. 3 is a schematic view of a portion of the refrigeration system of the device of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the device of the invention is shown in FIGS. 1 and 2, as designated by reference numeral 10. Device 10 includes a first container 12 within which is disposed a coil 14 of tubing 15. Coil 14 is of a size to accommodate therein and axially surround a liquid-containing bottle, such as a wine bottle 17. Tubing 15 is closed at one end of coil 14, the right end as seen in FIG. 2 (not shown), and at the other end of the coil is connected to a valve 16, the left end as seen in FIG. 2. Valve 16 conveniently includes an electromechanical actuator, such as a solenoid. The valve is mounted at one end of container 12 internally of the container, and is adapted to be connected to a source of gaseous refrigerant, such as carbon dioxide. The surface of tubing 15 which faces inwardly of coil 14 has a plurality of perforations 18 therein (FIG. 3). Upon opening of valve 16, the refrigerant flows through tubing 15, out of perforations 18 and radially inwardly of coil 14 against bottle 17.

Container 12 includes a first enclosure 20 comprising a cylindrical sleeve having one end, the left end as seen in FIG. 2, closed by a plate integral with the sleeve and the other end, the right end as seen in FIG. 2, closed by a removable cover 24. Enclosure 20 defines an inner compartment 22 therein within which coil 14 is disposed. Access may be obtained to compartment 22 by removing cover 24 for placing therein and removing therefrom bottle 17. A socket 28 is mounted on the plate which defines the end of compartment 22 opposite cover 24, radially centrally of coil 14, for supporting engaging the upper neck portion of bottle 17. Socket 28 properly positions and supports bottle 17 within coil 14.

Enclosure 20 is surrounded by a second enclosure 30 conveniently comprising a decorative cask- or keg-shaped member defining the exterior of container 12. Enclosures 20 and 30 define therebetween an outer compartment 32. Outer compartment 32 is filled with a porous insulating material 34, such as glass wool. A plurality of holes 36 are formed in enclosure 20 adjacent one end thereof through which compartments 22 and 32 are in fluid flow communication. Preferably, cover 24 closes the end of enclosure 20 which is adjacent holes 36. After the refrigerant flows out of perforations 18 and against bottle 17, it flows out of inner compartment 22, through holes 36 and into outer compartment 32, as shown by the arrows in FIG. 2. The refrigerant then flows through compartment 32, impregnating insulating material 34. Insulating material 34 thus functions not only as an insulator for maintaining reduced temperatures in inner compartment 22, but also, in conjunction with the refrigerant flowing through compartment 32, as a heat exchanger for further reducing the temperature in the inner compartment.

Preferably, a timer 38 (FIG. 3) is connected in series with the actuator of valve 16 to regulate the length of time the valve is open, and thus control the quantity of refrigerant introduced into container 12.

Device **10** also preferably includes a second container **40** within which a plurality of drinking glasses **42** may be accommodated. Container **40** conveniently comprises a drawer **44** and an enclosure **45** within which drawer **44** is slidably receivable. Glasses **42** may be placed into and removed from container **40** by pulling drawer **44** outwardly from enclosure **45**.

Container **40** is connected to container **12** by a suitable structural connecting means such as blocks **46** so that device **10** comprises an integral structural unit. Also, containers **12** and **40** are connected by fluid flow means, such as conduits **48**. Specifically, conduits **48** connect outer compartment **32** and enclosure **45**. The refrigerant thus flows out of compartment **32**, through conduits **48** and into enclosure **45** to chill glasses **42**. A plurality of holes **50** are formed in the bottom of drawer **44** which communicate with a similar plurality of holes **52** formed in the bottom of enclosure **45** when drawer **44** is closed. The refrigerant is exhausted to atmosphere from container **40** through holes **50** and **52**, as shown by the arrows in FIG. **2**.

As it will be apparent from the foregoing description, the refrigeration system of device **10** comprises an optimum means for cooling a bottled liquid. Also, the device is reliable, is economical to manufacture and maintain, and may be made in the form of a decorative and unusual furniture piece. With respect to the latter feature, the exterior surfaces of the device may be made from ornamental wood and decorative handles provided for cover **24** and drawer **44**, as shown in FIG. **1**. Furthermore, the device is portable and readily may be moved to a location of desired use.

While the foregoing constitutes a detailed description of a preferred embodiment of the invention, it is recognized that various modifications thereof will occur to those skilled in the art.

I claim:

1. A device for cooling bottled liquids comprising:

a thermally insulated container including a first enclosure defining an inner compartment therein, said first enclosure including a removable cover, a second enclosure surrounding said first enclosure and defining therebetween an outer compartment, said first enclosure having a plurality of holes therein, said inner and outer compartments being in fluid flow communication through said holes;

a coil of tubing disposed within said inner compartment and adapted to axially surround a liquid-containing bottle, said tubing being closed at one end of said coil, the surface of said tubing facing inwardly of said coil having a plurality of perforations therein; and

a valve connected to said tubing at the other end of said coil so that when a source of gaseous refrigerant is connected to said valve and a liquid-containing bottle is disposed within the coil, upon opening of the valve the refrigerant will flow through the tubing, out of the perforations and radially inwardly of the coil against the bottle to cool the liquid contained therein, and then out of said inner compartment, through said holes and into said outer compartment.

2. A device as recited in claim **1**, further comprising porous insulating material disposed within said outer compartment.

3. A device as recited in claim **1**, wherein said holes in said first enclosure are positioned adjacent one end thereof.

4. A device as recited in claim **3**, wherein said cover closes said one end of said first enclosure.

5. A device for cooling bottled liquids comprising:

a thermally insulated container;

a coil of tubing disposed within said container and adapted to axially surround a liquid-containing bottle, said tubing being closed at one end of said coil, the surface of said tubing facing inwardly of said coil having a plurality of perforations therein;

a valve connected to said tubing at the other end of said coil so that when a source of gaseous refrigerant is connected to said valve and a liquid-containing bottle is disposed within the coil, upon opening of the valve, the refrigerant will flow through the tubing, out of the perforations and radially inwardly of the coil against the bottle to cool the liquid contained therein;

a second container attached to said first-mentioned container and adapted to accommodate a plurality of drinking glasses therein; and

fluid flow means connecting said first and second containers so that after the refrigerant flows out of said perforations and against the bottle, the refrigerant will flow from said first container, through said fluid flow means and into said second container to chill any glasses disposed therein.