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DRY BOTTLE COOLER

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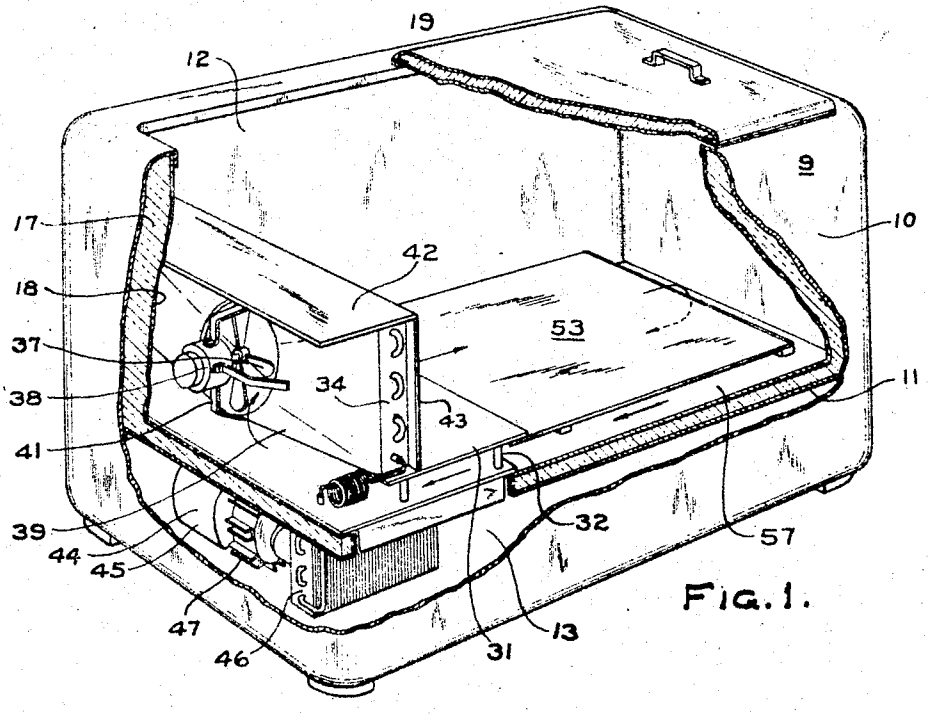


FIG. 1.

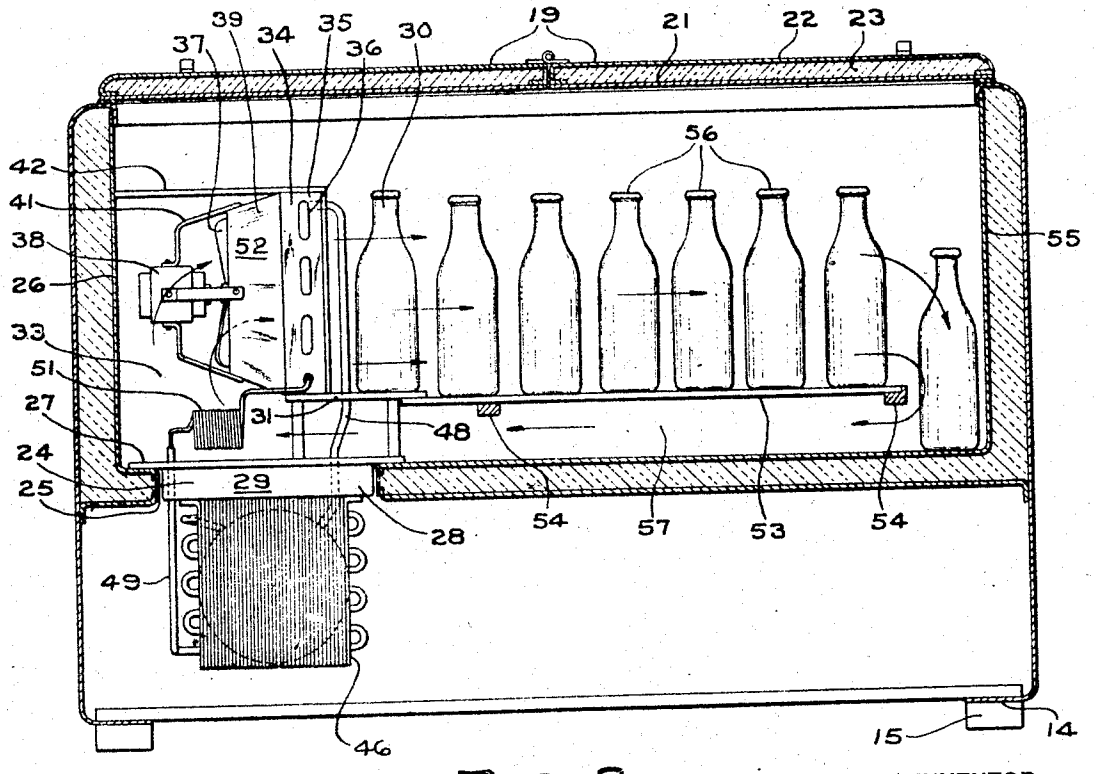


FIG. 2.

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DRY BOTTLE COOLER

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4 Claims. (Cl. 62—102)

This invention relates to bottle coolers and more particularly to bottle coolers utilizing forced circulation of chilled air for cooling the bottles, commonly known as dry bottle coolers.

One object of the invention is to provide a bottle cooler of the type described wherein the bottles are chilled rapidly.

Another object is to produce a dry bottle cooler having provisions for the removal of the entire cooling mechanism from the cabinet as a unit.

Another object is to provide a dry bottle cooler in which the bottles are readily accessible.

These and other objects are effected by my invention, as will be apparent from the description and claims taken in connection with the accompanying drawing forming a part of this application, in which:

Fig. 1 is a view in perspective of the bottle cooler of this invention with the walls partly broken away to show the interior of the cabinet; and

Fig. 2 is a vertical section taken near the side wall of the cabinet.

Referring now to the drawing, the reference numeral 9 designates a cabinet comprising an outer shell 10 divided by a horizontal partition 11 into an upper insulated bottle cooling chamber 12 and a lower machine compartment 13. The lower portion 14 of the outer shell 10 is provided with feet 15 at the corners. The upper chamber 12 is lined with insulating material 17 and is provided with an inner shell 18. The upper edges of the outer shell 10 are rolled inwardly and are then turned downwardly and are secured to the upper edges of the inner shell 18.

The chamber is provided with two insulated covers 19 hinged to one another at their edges. Each of these covers 19 comprises a lower plate 21 and an upper plate 22, the edges of the latter being rolled downwardly and then bent inwardly and secured to the edges of the lower plate. Insulating material 23 is packed between the two plates 21 and 22.

The bottom of the insulated chamber 12, including the partition 11, is provided with a rectangular opening 24, the edges of which are lined with a strip of heat insulating material 25 bent to the rectangular form of the opening 24 and secured to the downwardly turned edges of the inner shell 18 and the upwardly turned edges of the partition 11 by bolts (not shown) or similar means. This rectangular opening 24 is located near the end wall 26 of the insulated chamber 12.

Overlying the rectangular opening 24 is a plate 27 to which is secured a heat insulating portion 28 which projects into and substantially seals the rectangular opening 24 against heat leakage. The insulated portion 28 is of the same general construction as the walls of the insulated chamber 12. The cover plate 27 together with the insulated portion forms a removable section 29 in the bottom of the insulated chamber 12.

A shelf 31 is supported on and above the removable section 29 by supports 32 and is spaced from the end wall 26 of the insulated chamber to provide an air passage 33 along this wall 26. Secured on one part of the shelf 31 is a refrigerant evaporator or cooling unit 34 comprising a series of parallel plates 35 through which a refrigerant tube 36 is passed back and forth, the plates 35 forming heat absorbing fins for the tube. The remainder of the shelf 31 is adapted for the storage of bottles 38.

Between the evaporator 34 and the wall 26 of the insulated chamber 12 is an air circulating fan 37 and a motor 38 for driving the same. A shroud 39 secured to the evaporator 34 directs the air stream of the fan 37 over the entire area of the evaporator 34 and between its fins 35. The shroud 39 also supports the motor 38 by means of metal strips 41.

A top plate 42 extends horizontally from the top of the evaporator 34 to the end wall 26, and a vertical plate 43 extends from each side of the evaporator 34 to the adjacent side of the insulated chamber 12 to air-seal the evaporator 34 so that only the air drawn from below the shelf 31 is circulated by the fan 37 through the evaporator 34.

A refrigerant liquefying unit 44 is secured to the underside of the removable section 29. The unit 44 comprises a motor driven compressor (not shown) sealed in a casing 45, and a refrigerant condenser 46, cooled by a fan (not shown) which circulates air through the condenser 46 and over the sealed casing 45. The fins 47 secured to the casing aid in dissipating the heat. The refrigerant liquefying unit 44 connects through a suction tube 48 with the upper portion of the evaporator 34 and through a pressure tube 49 and a coiled capillary impedance tube 51 to the tube 36 of the evaporator 34.

The refrigerant liquefying unit 44 is of such size that it may pass upwardly through the rectangular opening 24 in the bottom of the insulated chamber 12 so that the entire assembly of the heat absorbing apparatus 52 may be lifted from its position in the cabinet and out through the opening in the top of the insulated chamber 12. The assembly of the heat absorbing ap-

paratus 52 comprises the evaporator 34, the fan 37, the shroud 39, the shelf 31, the removable section 29, and the refrigerant liquefying unit 44.

This construction permits the manufacture of the cabinet 9 in one factory and the manufacture of the heat absorbing apparatus 52 in another factory. The two portions of the bottle cooler 9 and 52 may then be assembled wherever convenient. It also facilitates the replacement of either the cabinet 9 or the heat absorbing apparatus 52 in the field.

A horizontal metal shelf 53 is supported on the struts 54 in the insulated chamber 12 and is positioned so as to partially underlie and contact the shelf 31, and extends horizontally to the wall 55, but is spaced from the latter. The horizontal shelf 53 is adapted for storing the bottles 56 to be cooled and is raised from the bottom of the insulated chamber 12 to form an air duct 57 together with the shelf 31.

The complete path of the air circulated in the insulated chamber will be from the fan 37, through the evaporator 34, past the bottles 30 and 56 stored on the shelves 31 and 53 and through the space between the edge of the shelf 53 and the end wall 55, through the air duct 57 underneath the shelves 31 and 53, and then upwardly to the fan 37. The direction of the air flow may also be reversed if desired. The active contact of the cool air with the surface of the bottles 30 and 57 cools them rapidly. The air also wipes the upper as well as the lower surface of the shelf and aids in cooling the bottles by carrying away the heat conducted by the bottles to the shelf.

From the above it will be seen that this invention provides a bottle cooler which rapidly and efficiently cools the bottles, and in which the bottles are readily accessible. The refrigerating unit of this invention is also adapted to be constructed separately and may be assembled to the cabinet wherever convenient.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. In a dry bottle cooler, the combination of an insulated chamber, a cooling unit therein near to but spaced from one end and spaced from the bottom of said chamber, said cooling unit having transverse air passages, a substantially horizontal shelf for supporting bottles extending from the lower edge of said cooling unit towards the end of said chamber opposite the end containing the cooling unit, and means for circulating the air in said chamber through the air passages of said cooling unit, across the bottles, underneath said shelf and then to said cooling unit.

2. In a dry bottle cooler, the combination of an insulated chamber including side and bottom walls and having an opening in its top, a cooling unit in said chamber, said cooling unit having transverse air passages, means for forcing air through said passages, means for supporting bottles in the path of the air passing through said passages, said cabinet having a duct for returning the air to said cooling unit, said supporting means forming a portion of said duct, a refrigerant supplying unit adjacent said chamber, and tubes connecting said cooling unit and said refrigerant supplying unit passing through a wall of said chamber, a section of the wall of said chamber and also a section of said supporting means being removable to permit the removal of said cooling unit and said refrigerant supplying means from said chamber through the opening in the top thereof without disconnecting the tubes connecting the cooling unit and the refrigerant supplying unit.

3. In a dry bottle cooler, the combination of a cabinet, an insulated chamber therein, said chamber including side and bottom walls, a cooling unit in said chamber near but spaced from one end and spaced from the bottom of said chamber, said cooling unit having transverse air passages, a substantially horizontal shelf for supporting bottles extending from the lower edge of said cooling unit towards the end of said chamber opposite the end containing the cooling unit, means for forcibly circulating the air in said chamber through the air passages of said cooling unit, across the bottles, underneath said partition and then to said cooling unit, a refrigerant supplying unit in said cabinet adjacent said insulated chamber and ducts connecting said cooling unit and said refrigerant supplying unit, said ducts passing through a wall of said insulated chamber, said cooling unit, refrigerant supplying unit, ducts and the section of the wall of said insulated chamber adjacent said ducts being removable from the remainder of said insulated chamber as a unit.

4. In a dry bottle cooler, the combination of an insulated chamber, a shelf therein for supporting bottles, a cooling unit and a fan disposed in the insulated compartment, said cooling unit and shelf forming a side and bottom wall respectively of a bottle storage zone, said fan and cooling unit being arranged to blow chilled air from the cooling unit horizontally and directly over said bottles, said shelf forming the top of a passage for returning air to the cooling unit after it has passed over the bottles.

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