Nov. 17, 1936. J. G. KING 2,061,427

REFRIGERATING APPARATUS

Filed Aug. 16, 1935

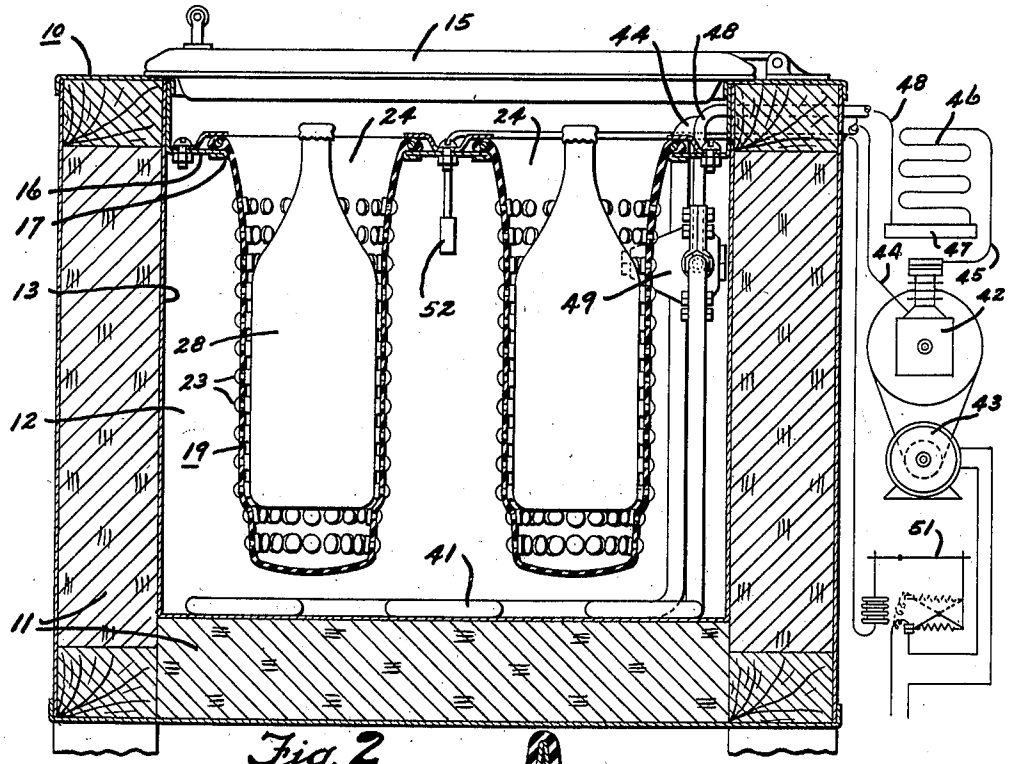


Fig. 2

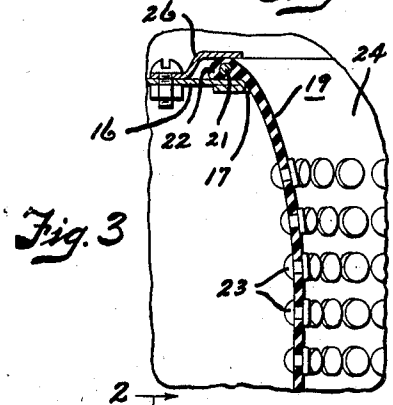


Fig. 3

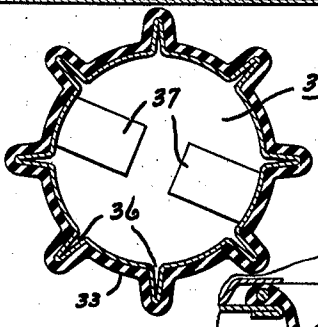


Fig. 5

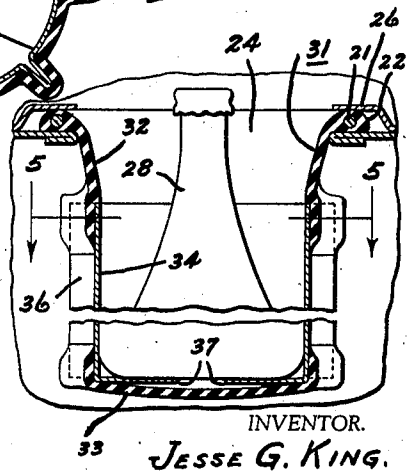


Fig. 4

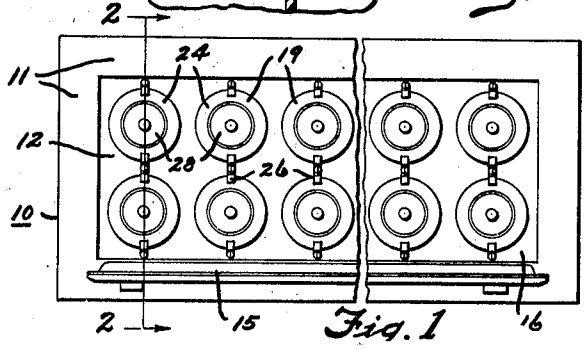


Fig. 1

INVENTOR.
JESSE G. KING.

BY

Spencer, Hardman and Fehr.
HIS ATTORNEYS.

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REFRIGERATING APPARATUS

Jesse G. King, Dayton, Ohio, assignor to General Motors Corporation, Dayton, Ohio, a corporation of Delaware

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This invention relates to refrigerating apparatus and particularly to refrigerated cabinets adapted to receive bottled beverages or the like to be cooled.

An object of my invention is to provide an improved refrigerating apparatus of the type wherein bottled beverages may be cooled by intimate thermal contact with a liquid cooling medium contained in a refrigerator cabinet while maintaining the surface of the bottles in a dry condition.

Another object of my invention is to provide an improved refrigerator cabinet for the reception and storage of bottled beverages to be cooled by submerging a plurality of dry bottle receiving compartments in a body of liquid cooling medium and by forming the bottle receiving compartments or receptacles of flexible material so that the walls thereof will firmly engage bottles of different diameters.

In carrying out the foregoing objects it is a still further object of my invention to provide the flexible bottle receiving compartments or receptacles with metallic portions or with a plurality of metallic inserts which pass entirely through the wall of the receptacles and firmly engage a bottle adapted to be located therein for providing intimate thermal contact of the bottle with the liquid cooling medium.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a top plan view of a refrigerator cabinet constructed according to my invention and showing the door affording access to the interior thereof in open position;

Fig. 2 is an enlarged vertical sectional view taken on the line 2—2 of Fig. 1 of the refrigerator cabinet and diagrammatically showing a refrigerating system connected thereto;

Fig. 3 is an enlarged fragmentary sectional view showing the flexible bottle receptacle in its normal position;

Fig. 4 is a fragmentary sectional view of a modified form of flexible bottle receptacle; and

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 4.

Referring to the drawing, for the purpose of illustrating the present invention, I have shown in Fig. 1 thereof a refrigerator cabinet generally represented by the numeral 10. Cabinet 10 includes a plurality of metal covered insulating walls 11 forming a compartment 12 therein (see Fig. 2). The compartment 12 is provided with a metallic lining member 13 which forms an open-top tank for the reception of a liquid cooling medium such for example, as a brine solution (not shown). The open top of the compartment or tank 12 is adapted to be closed by a door 15.

A metal partitioning or baffle member 16 provided with a plurality of openings 17 is supported horizontally across the top of compartment or tank 12 (see Fig. 2). This member 16 forms a support for a plurality of receptacles, generally represented by the reference character 19, which extend through the openings 17 and depend into the body of liquid cooling medium in the tank 12 below the partition 16. Each receptacle 19 is formed of a flexible rubber-like material and has a cylindrical wire ring 21 molded within a rim portion 22 thereof to stiffen the rim (see Fig. 3). Each receptacle 19 is also provided with a plurality of metallic inserts 23 which extend entirely through the wall of the receptacle. The inserts 23 are preferably formed of a metal of good heat conductivity such for example, as copper or aluminum and these inserts may be secured to the wall of the receptacle 19 during molding of the receptacle or they may be placed in openings provided in the receptacle wall after the receptable has been molded into the desired shape. In either event it is to be understood that the inserts 23 are secured to the receptacle wall in such manner as to be sealed thereto so as to prevent the passage or leakage of the liquid cooling medium into the compartments 24 provided by the receptacles 19. The inserts 23 may be shaped into any desired form and are preferably provided with a substantially flat inner surface for abutment against bottles in a manner and for the purpose to be presently described. Any suitable number and design of clamps 26 may be employed for tightly compressing the rims 22 of the receptacles 19 against the metal baffle or partitioning member 16 about the openings 17 therein to prevent the receptacles from being forced through the openings 17 and to prevent them from being elevated relative to the baffle or partition 16.

In Fig. 2 of the drawing the normal diameter of the receptacles 19 is shown below the bottles 28 positioned therein. It will be noted that the insertion of the bottles 28 into the compartments 24, provided by the receptacles 19, has flexed or expanded the receptacle walls beyond their normal diameter. In so expanding the receptacles 19 the flat surfaces of the inserts 23 have been caused, by the flexibility of the receptacles, to

firmly engage the wall of the bottles 28. The inserts 23 therefore provide intimate thermal contact between the bottles 28 and the liquid cooling medium adapted to be contained in tank 12. Since certain of the bottles of bottled beverages vary in diameter or contour from certain other bottles of bottled beverages it will be apparent that the flexibility of the receptacles 19 permit the compartments 24 to receive variously shaped bottles. The flexibility of the receptacles 19 thereby permit the metal inserts 23 to firmly engage curved outer surfaces of bottles other than those illustrated to afford rapid heat conduction from all parts of the bottles directly to the cooling liquid. Bottles in the same class of bottled beverages quite frequently vary in diameter relative to one another and the flexible receptacles 19 are advantageous in causing firm engagement of the metallic inserts 23 with the wall of such bottles. The bottles 28 although being at times somewhat forced into the compartments 24, provided by the receptacles 19, are freely removable from the receptacles since the interior of the compartments 24 are maintained in a substantially dry condition. The door 15 provided on cabinet 10 prevents moisture of the atmosphere externally of the cabinet from condensing on the bottles 28 or in the compartments 24 to thereby aid in maintaining the compartments in a dry condition.

Referring now to Fig. 4 of the drawing wherein I have shown a modified form of the invention it will be noted that the receptacle 31 shown therein comprises an upper molded rubber ring-like portion 32 and a lower molded rubber ring-like portion 33. Interposed between the upper portion 32 and the lower portion 33 of receptacle 31 there is a thin metallic collar-like member 34. The rubber portions 32 and 33 of receptacle 31 are adapted to be molded directly about the metal collar 34 in any suitable and well-known manner. The receptacle 31 is of a general circular form in horizontal cross-section and the wall of the metal collar 34 is provided with a plurality of vertically extending and outwardly directed folds or laps 36. Collar 34 is also provided at its bottom with flat inwardly directed extensions 37 which serve to support the bottle 28 within the compartments 24 provided by the receptacles 31. The extensions 37 eliminate the necessity of the lower rubber portion 33 supporting the bottle and thereby prevents the rubber portion 33 from being torn loose from the metal collar 34. The folds or laps 36 permit the cylinder-like collar 34 to be flexed or expanded outwardly for receiving bottles that vary in outside diameter and therefore the receptacles 31 have the same advantage as described in reference to the receptacles 19 since their diameter may be expanded. It will be understood that the metal collar portion 34 of receptacle 31 provides good heat conduction between the bottles 28 and the liquid cooling medium or, in other words, the metal collars form an intimate thermal contact of the bottles 28 with the liquid.

The refrigerating apparatus associated with the refrigerator cabinet 10 and diagrammatically shown in Fig. 2 of the drawing includes a cooling element or evaporator 41 of any conventional design or construction and disposed in tank 12 in direct thermal contact with the liquid cooling medium therein. A compressor 42 is operatively connected to an electric motor 43 through suitable belt and pulley connections. Operation of compressor 42 withdraws gaseous or evaporated refrigerant from the evaporator 41 through the pipe 44. The evaporated refrigerant is compressed by the compressor 42 and circulated under pressure through pipe 45 to a condenser 46. The compressed refrigerant is cooled and liquefied in any well-known manner in the condenser 46. The liquefied refrigerant flows into the receiver 47 where it is stored prior to being admitted to the evaporator 41. A liquid refrigerant supply pipe 48 extends from the receiver 47 to the evaporator 41 and this pipe has a conventional expansion device or valve 49 interposed therein for controlling or regulating the flow of liquid refrigerant into the evaporator or cooling element 41. The electric circuit to motor 43 is controlled by a suitable snap acting switch 51. Switch 51 is actuated by expansion and contraction of a bellows containing a volatile fluid and which bellows forms a part of a thermostatic system including a bulb 52 mounted within the tank 12 of cabinet 10. When the temperature of the body of cooling liquid increases or decreases the pressure of the volatile refrigerant in the thermostatic system increases or decreases in accordance with the difference in temperature of the liquid and causes intermittent operation of the refrigerating apparatus to maintain the body of cooling liquid substantially at a constant predetermined temperature as is well-known in the art.

From the foregoing it will be seen that I have provided an improved refrigerating apparatus of the type including a cabinet adapted to receive and cool bottled beverages. My improved apparatus, while permitting the bottled beverages to be kept or stored in a dry condition, quickly and efficiently cools the contents of the bottles by the contact of the metal portions or the metal inserts of the bottle receptacles with the bottles and with the refrigerated liquid cooling means. The rapid cooling of the bottled beverages permits an apparatus of the type disclosed to be made smaller than conventional similar apparatuses because the large storage capacity of such apparatus is not necessary in the present invention. The small compact apparatus disclosed is useful in stores where there is no soda fountain and where syrups contained in bottles and dispensed with ice cream in making certain delicacies must be kept cold. The apparatus is likewise useful for storing bottled beverages of various types at such places as stores, gasoline filling stations, etc., where bottled beverages are on sale.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of liquid, and means for receiving and storing a bottle below the level of and in intimate thermal contact with the body of liquid in said chamber, said last named means comprising a receptacle having flexible walls adapted to firmly engage the bottle.

2. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of

liquid, and means for receiving and storing a bottle below the level of and in intimate thermal contact with the body of liquid in said chamber, said last named means comprising a flexible rubber-like receptacle including metallic portions contacting the body of cooling liquid and engaging the bottle.

3. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of liquid, an open top flexible receptacle carried by said cabinet and depending into the body of cooling liquid, said receptacle being constructed and arranged to form a dry compartment below the level of the body of cooling liquid in said chamber, said compartment being adapted to receive a bottle therein, and said receptacle being expansible by the insertion of a bottle into said compartment to cause the wall of said receptacle to firmly engage the bottle.

4. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of liquid, an open top receptacle carried by said cabinet and depending into the body of cooling liquid, said receptacle being formed of flexible rubber-like material and providing a dry compartment below the level of the body of cooling liquid in said chamber, said receptacle including metallic portions contacting the body of cooling liquid and exposed to the interior of said compartment, said compartment being adapted to receive a bottle therein, and said receptacle being expansible by the insertion of a bottle into said compartment to cause the metallic portions of said receptacle to firmly engage the bottle.

5. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of liquid, an open top receptacle carried by said cabinet and depending into the body of cooling liquid, said receptacle being formed of flexible rubber-like material and providing a dry compartment below the level of the body of cooling liquid in said chamber, said receptacle including a plurality of metallic inserts extending through and sealed to the wall thereof, said compartment being adapted to receive a bottle therein, and said receptacle being expansible by the insertion of a bottle into said compartment to cause the metallic inserts of said receptacle to firmly engage the bottle.

6. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming a chamber adapted to contain a body of liquid, means for cooling the body of liquid, means forming a dry compartment below the level of the body of liquid in said chamber, and said last named means including flexible walls adapted to be expanded by the insertion of a receptacle into said compartment.

7. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming an open top chamber therein adapted to contain a body of liquid, means for cooling the body of liquid in said chamber, a baffle carried by said cabinet and extending over the body of liquid in said chamber, said baffle having an opening therein, an open top receptacle carried by said baffle and depending through the opening therein into the body of cooling liquid, said receptacle being formed of flexible material and providing a dry compartment below the level of the body of cooling liquid in said chamber, said compartment being adapted to receive a container therein, said receptacle being expansible by the insertion of a container into said compartment to cause the wall of said receptacle to firmly engage the container, and a door for closing and providing access to said compartment.

8. A refrigerating apparatus comprising in combination, a cabinet, means within said cabinet forming an open top chamber therein adapted to contain a body of liquid, means for cooling the body of liquid in said chamber, a baffle carried by said cabinet and extending over the body of cooling liquid in said chamber, said baffle having an opening therein, an open top receptacle carried by said baffle and depending through the opening therein into the body of cooling liquid to provide a dry compartment below the level of the liquid, said receptacle being formed of flexible material having metallic portions contacting the body of cooling liquid and exposed to the interior of said compartment, said compartment being adapted to receive a container therein, said receptacle being expansible by the insertion of a container into said compartment to cause the metallic portions of said receptacle to firmly engage the container, and a door for closing and providing access to said compartment.

9. An apparatus comprising in combination, a cabinet having a chamber formed therein, heat exchange means within said chamber, a receptacle securely mounted within said chamber and forming a compartment therein for receiving an article, at least a portion of the walls of said compartment being movable relative to other portions thereof to cause said receptacle to frictionally engage the article for transferring heat between the article and said heat exchange means, and the article being removable from said compartment while said receptacle remains in its secured position within said chamber.

10. An apparatus comprising in combination, a cabinet having a chamber formed therein, heat exchange means within said chamber, a receptacle securely mounted within said chamber and forming a compartment therein for receiving an article, at least a portion of the walls of said compartment being flexible to cause said receptacle to frictionally engage the article for transferring heat between the article and said heat exchange means, and the article being removable from said compartment while said receptacle remains in its secured position within said chamber.

JESSE G. KING.