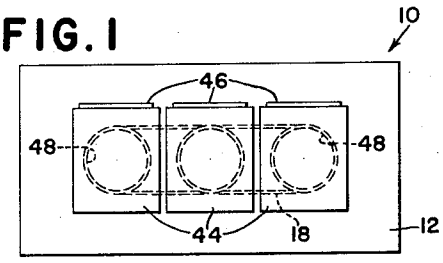
Nov. 1, 1960 H. F. COHRT 2,958,212

REFRIGERATION APPARATUS

Filed Jan. 27, 1958

FIG. 1



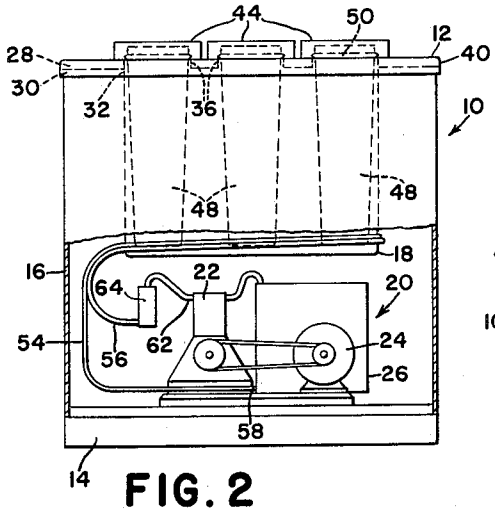


FIG. 2

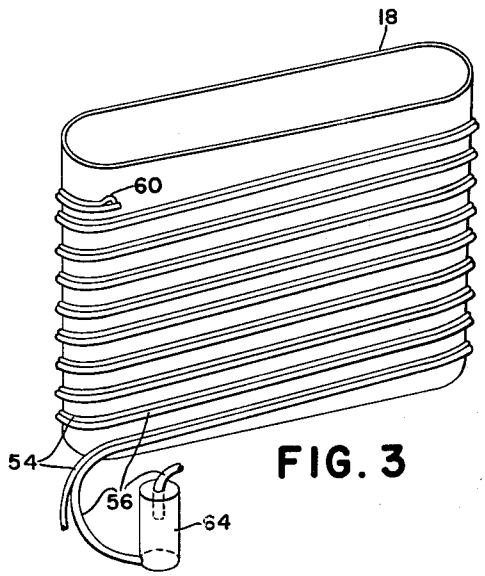


FIG. 3

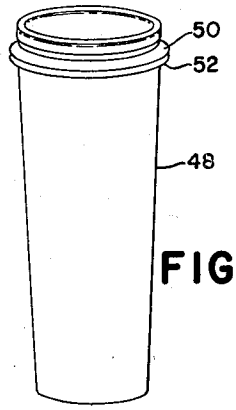


FIG. 4

FIG. 5

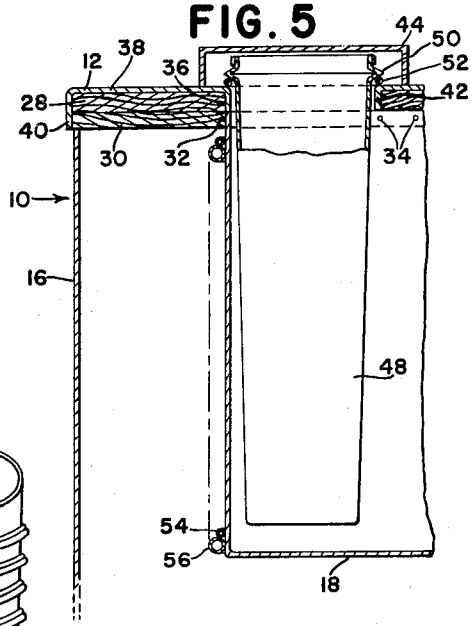




FIG. 6

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REFRIGERATION APPARATUS

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3 Claims. (Cl. 62—441)

This invention relates to refrigeration apparatus and more particularly to such apparatus as used in conjunction with a novel and compact unit for chilling and freezing refreshments for dispensing or serving at such establishments as drive-ins and the like.

It is a principal object of the invention to provide a compact cabinet structure containing a hollow or shell-like cooler or evaporator below the cabinet top and to provide in said top a plurality of openings for removably supporting a plurality of containers for depending into and to be chilled by the evaporator. It is a further feature to provide the containers and the openings of the same cross-sectional shape so as to avoid spilling of container contents into the cabinet and/or evaporator. Other features in this respect include gasket means for the containers and individual covers therefor.

It is another principal object of the invention to provide the evaporator with a double passage or coil system in which one passage of relatively small cross-sectional area is connected to the high side of the refrigerating unit and extends between opposite ends of the evaporator to pre-cool the refrigerant and another passage extends reversely to the first and is of larger cross-sectional area to return the refrigerant to the low side of the refrigerating unit. It is a further feature in this respect that the passages or conduits extend sinuously or helically and parallel each other.

The foregoing and other important objects and desirable features inherent in and encompassed by the invention will become apparent as a presently preferred embodiment thereof is disclosed in detail in the ensuing specification and accompanying drawings, the figures of which are described below, it being understood that departure from these details may be resorted to without avoiding the spirit and scope of the invention.

Figure 1 is a plan of the apparatus.

Figure 2 is a side view, partly in section.

Figure 3 is an enlarged perspective of the evaporator.

Figure 4 is an enlarged perspective of a container.

Figure 5 is an enlarged fragmentary view, partly in section, illustrating the manner of supporting a container.

Figure 6 is an enlarged fragmentary view, partly in section, showing the junction between the two conduit or passage means.

The cabinet is indicated in its entirety at **10** and is shown as having a top **12**, a bottom **14** and upright peripheral wall means **16** extending from top to bottom to form an enclosure for an interiorly mounted cooler or evaporator **18** and a refrigerating unit **20**, here shown by way of example as being of a conventional compressor-condenser type having a compressor **22**, driven by a motor **24**, and a condenser **26**. Other types or means of refrigeration may be resorted to on the broad aspects of the invention.

The top **12** is here disclosed as comprising an outer or upper board-like member **28** superimposed over an inner or under board-like member **30**, both of which may

be of plywood or equivalent material having the requisite strength and insulation properties. The member **30** has a single central elongated opening **32** therein for receiving the upper comparably-shaped marginal edge portion of the evaporator or cooler **18** which, as best shown in Figure 3, is in the form of a shell-like member depending into the interior of the cabinet above the refrigerating unit **20**. Suitable fasteners, such as nails **34**, may be used to secure the upper end of the evaporator shell to the member **30** within the member opening **32**.

The top or outer member **28** has a plurality of openings **36**, here three in number, which are circular and in register with the top of the shell via the opening **32** in the member **30**. The number of openings **36** can of course be varied. The endmost openings are concentric with the semi-cylindrical sides of the shell **18** and the central opening **36** is centered between these endmost openings. The cabinet wall means **16** is metallic or metal covered, as by stainless steel or the like, and the top member **28** is similarly covered by a stainless steel sheet **38**, flanged peripherally at **40**, and having annular collars **42** spun down into or otherwise formed to line the openings **36**. The two members **28** and **30** are secured together in any appropriate manner not material here and the entire top assembly **12** is likewise secured to the cabinet wall means **16**. The cabinet may have suitable vents, removable doors, etc. which are details of no moment so far as concerns the present invention.

A plurality of inverted pan-like covers **44** are hinged at **46** to the cabinet top and individually cover the openings **36** as well as the tops of a plurality of containers or cans **48** which are removably supported by the top **12** and normally depend therefrom through the respective lined openings **36** and single opening **32** into the evaporator **18**.

Each container is metallic, preferably of stainless steel, and has adjacent to its top an annular support portion in the form of an integral bead **50** which receives below it an annular gasket means, here in the form of an O-ring **52** of rubbed or like material. The lined openings **36** are of such size relative to the beads **50** on the containers that the containers fit the openings for downward insertion to the point at which each bead **50** and gasket **52** engages the marginal portion of the top about the respective opening. Each container may of course be upwardly withdrawn from its opening. Since the openings **36** and containers **48** are of the same cross-sectional shape, and because of the seals afforded at **52**, spillage from the containers cannot enter the cabinet or evaporator. Such spillage is apt to occur, in the nature of things, because the apparatus disclosed is especially useful in chilling various flavors of non-alcoholic or "soft" drinks which, in the containers, attain a "slush" form and are ladled out into glasses, paper cups, etc. when served.

The evaporator **18**, as previously described, is a shell in the particular instance disclosed so as to accommodate the depending containers **48**, and further comprises first and second refrigerant conduits or passage means **54** and **56**, the former being of relatively small cross-sectional area and the latter being larger. In the example shown, the conduit **54** is ¼" O.D. metallic tubing and the conduit **56** is ½" O.D. of the same material.

The conduit **54** is connected at **58**, as by a conventional expansion valve or capillary tube, to the high side of the refrigerator unit **20** and winds sinuously or helically about the metallic shell **18** from bottom to top thereof, and has a terminal end portion **60** connected (Figure 6) to the closed upper end of the larger conduit **56**, which winds reversely sinuously or helically downwardly about the shell **18** to a lower end connected at **62** to the low

side of the refrigerating unit. The two conduits are preferably in contact with each other and of course contact the shell. Suitable soldering or brazing may be employed in the connections, or the conduits may be pressed or otherwise formed into the shell. The small conduit 54 carries the refrigerant and precools same as it travels to the top of the shell, and sudden expansion or "flash" gases are avoided at the junction of the two conduits at 60, as would occur were the refrigerant introduced directly into the large conduit 56 at its bottom. Also, although heat exchangers as separate units are known for precooling refrigerant, these are expensive, cumbersome and difficult to install and use because of space considerations. By accomplishing the same result with the small conduit 54, considerable space is saved. Although the conduit 54 is shown as wound about the evaporator shell and is thus out of the way, it could be placed inside if desired. An accumulator or receiver 64 may be used in the larger conduit.

Another advantage of this arrangement is that the top part of the evaporator is adequately cooled as the precooled refrigerant reaches same, and the lower part will be naturally cooled as the cold descends by gravity.

In its overall aspects, the invention provides a novel and compact chilling and dispensing unit with the pendently supported containers 48, individual covers 44 and evaporator structure 18–54–56. This unit is neat in appearance, easy to keep clean and service and economical to manufacture. Other features and advantages will of course occur to those versed in the art, as will alterations in the preferred embodiment disclosed.

What is claimed is:

1. Refrigerating apparatus of the class described, comprising: a cabinet having a bottom, a top and upright peripheral walls joining the top and bottom, a hollow evaporator within the container and having a bottom spaced above the cabinet bottom and peripheral sides spaced inwardly from the peripheral walls of the cabinet and rising to a top terminal rim, said evaporator being elongated in one of its horizontal dimensions so that said top rim is relatively long and narrow, said cabinet top being recessed from below to provide a downwardly facing pocket congruent with and receivable of said rim and said cabinet top in the area thereof defining said pocket providing a peripheral downwardly facing stop against which said rim abuts from below and a depending peripheral portion surrounding said rim, means securing the rim to said depending portion to suspend the evaporator from said cabinet top, and said cabinet top having therein a plurality of through openings arranged in closely spaced side-by-side relation and aligned lengthwise of the long dimension of the pocket and of such size as to collectively register with the evaporator via said pocket, a plurality of open-topped individual containers equal in number to and respectively downwardly received by and removable upwardly from the openings and of such height to depend into the evaporator, said containers having stop means at their top portions engageable downwardly with the cabinet top to limit downward insertion of the containers and to suspend the containers within the evaporator, a plurality of individual covers, one for each container, mounted on the cabinet top to selectively cover and uncover the tops of the containers, and a refrigerating unit connected to and for refrigerating the evaporator.

2. Refrigerating apparatus of the class described, comprising: a cabinet having a bottom, a top and upright peripheral walls joining the top and bottom, a hollow evaporator within the container and having a bottom spaced above the cabinet bottom and peripheral sides spaced inwardly from the peripheral walls of the cabinet and rising to a top terminal rim abutting the cabinet top from below, said evaporator being elongated in one of its horizontal dimensions so that said top rim is relatively long and narrow, means securing the rim to the cabinet top to suspend the evaporator from said cabinet top, and said cabinet top having therein a plurality of through opening arranged in closely spaced side-by-side relation and aligned lengthwise of the long dimension of the evaporator and of such size as to collectively register with the evaporator, a plurality of open-topped individual containers equal in number to and respectively downwardly received by and removable upwardly from the openings and of such height to depend into the evaporator, said containers having stop means at their top portions engageable downwardly with the cabinet top to limit downward insertion of the containers and to suspend the containers within the evaporator, a plurality of individual covers, one for each container, mounted on the cabinet top to selectively cover and uncover the tops of the containers, and a refrigerating unit connected to and for refrigerating the evaporator.

3. The invention defined in claim 2, including: a first refrigerant conduit means having one end connected to the high side of the refrigerating unit and wound in helical fashion on the evaporator from bottom to top thereof and having a terminal end adjacent to said rim, and a second refrigerant conduit means wound in helical fashion on the evaporator from top to bottom thereof and lying in contact with the first conduit means through the extent thereof on the evaporator and further having a top end connected to the terminal end of said first conduit means and having its opposite lower end connected to the low side of the refrigerating unit, said first conduit means having a relatively small cross-sectional area and said second conduit means having a relatively larger cross-sectional area.

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