Dec. 16, 1941. O. J. VINCENT 2,266,346

DEHYDRATING MEANS FOR MULTIPLE PANELED REFRIGERATING CASES

Filed July 25, 1939 2 Sheets-Sheet 1

Fig. 1

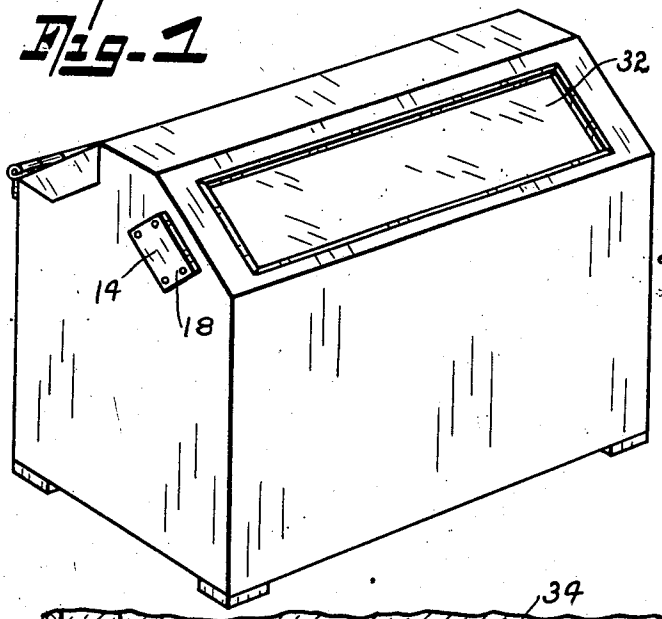


Fig. 2

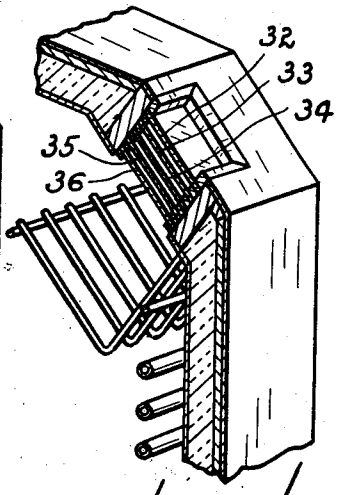


Fig. 3

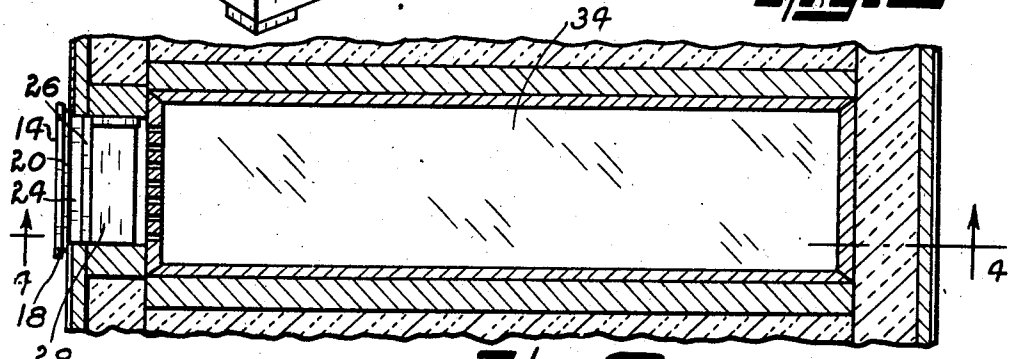


Fig. 4

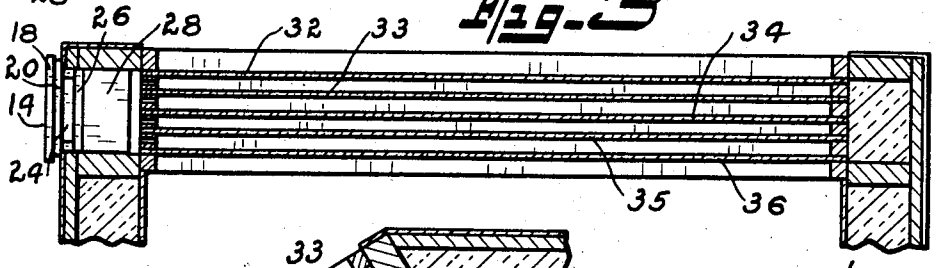
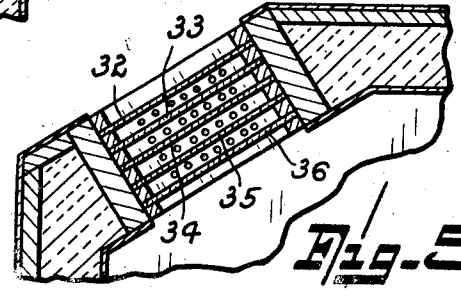


Fig. 5



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DEHYDRATING MEANS FOR MULTIPLE PANELED REFRIGERATING CASES

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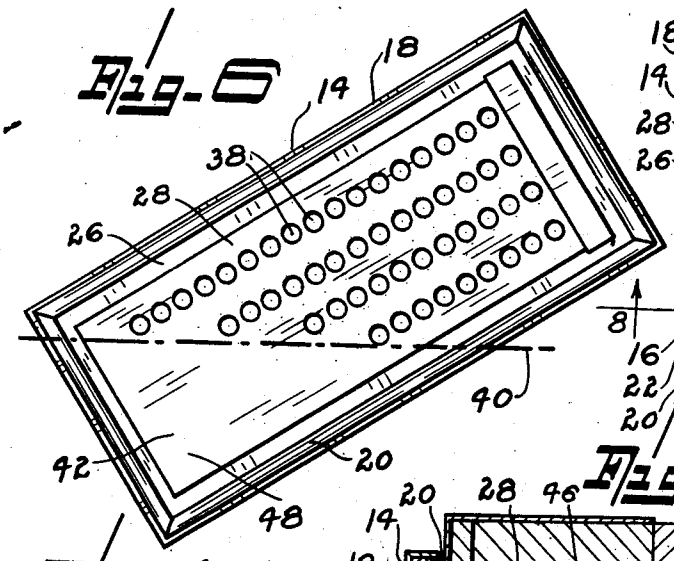


Fig. 6

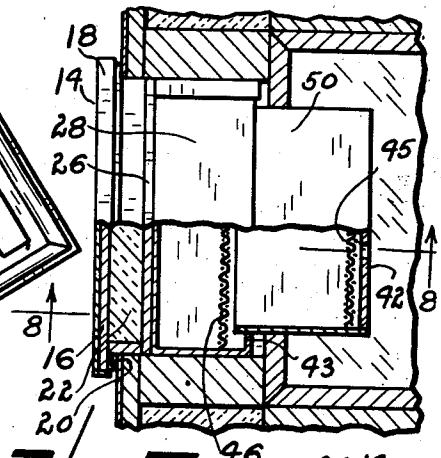


Fig. 7

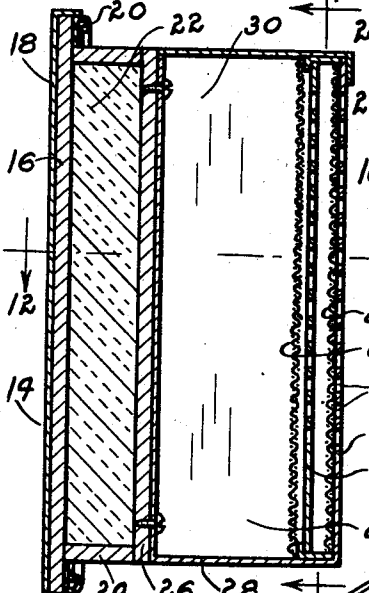


Fig. 10

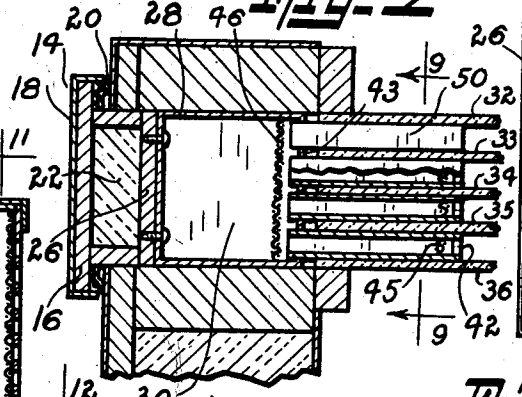


Fig. 8

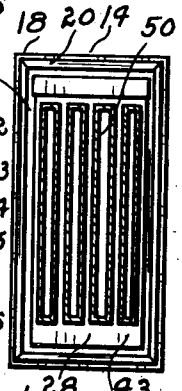


Fig. 9

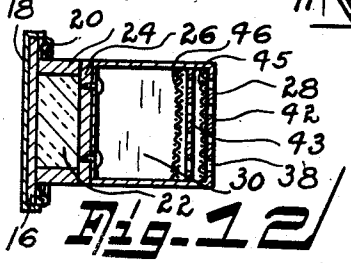


Fig. 12

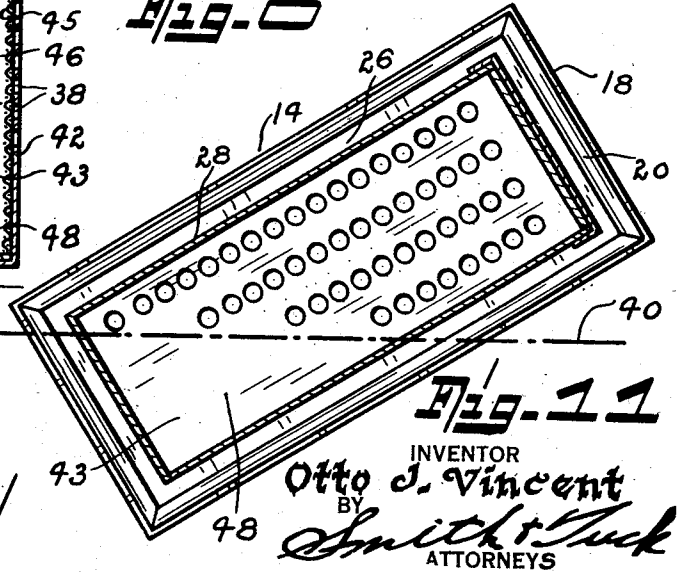


Fig. 11

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UNITED STATES PATENT OFFICE

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DEHYDRATING MEANS FOR MULTIPLE PANELED REFRIGERATING CASES

Otto J. Vincent, Seattle, Wash.

Application July 25, 1939, Serial No. 286,465

5 Claims. (Cl. 20—40.5)

My present invention relates to the art of refrigerated cabinets and more particularly to that type of cabinet, in which relatively low temperature is maintained, which requires that a plurality of glass panels be used for the purpose of insulating against the heat from the room in which the refrigerator is placed, and more especially my invention relates to a dehydrating means for multiple paneled refrigerating cases.

My device consists of a removable cartridge container which employs an anhydrous material, such as calcium chloride, and is so arranged that the cartridge of the dehydrator will absorb the moisture in spaces between the various glass panels of the showcase. It is made in such a way as to provide a sump or reservoir so that as the moisture extracted from the space between the glass panels breaks down and liquifies the absorbent material, this liquid will be retained within the sump and will not flood out or run down into the showcase itself or in the spaces between the glass panels where it would be very difficult to remove the unsightly material. In providing such a device it is necessary that the device itself be fully insulated so that it will not cause a pathway for heat to enter the cabinet and thus detract from the cabinet's efficiency. Further, it is necessary to provide easy access of the air, between the panels, into the cartridge without any danger of the cartridge fluid getting out of the container.

With the introduction of frozen foods, such as meat and fruit and vegetables, it is necessary that these sharply frozen materials be maintained at a temperature below freezing and in some cases considerably below freezing, sometimes even near zero. Under such conditions it is necessary that the cabinet be adequately insulated and the insulation of the walls, and sides of the cabinet are relatively simple problems, being merely necessary to have suitable insulation of adequate amount. However, a showcase, to serve its purpose, must be glass paneled so that shoppers can see the merchandise on display, and unless a number of air cells are created by successive panels of glass, there will be a great deal of loss at this point. Consequently, it is the purpose of my invention to provide cabinets having a plurality of compartments formed by spaced glass panels. For near zero temperatures it has been found that usually four such compartments are particularly desirable, and the difference in temperature between the innermost glass panel and the outermost one will be usually between sixty and seventy degrees. In some cases, the outer panel in summer time might get considerably warmer, where the range might be up to one hundred degrees. If the vision is not to be impaired it is essential that there be absolutely no frosting or condensation of water or vapor, which is recognized as steaming, and to accomplish this I have so arranged my cartridge that it may be suitably connected into each of the air compartments formed by the glass panels, to the end that all water vapor therein can be collected into a moisture absorption material, such as activated alumina, calcium chloride or other elements of a similar character.

The principal object of my invention is, therefore, to provide a single cartridge which will serve a plurality of air compartments in a showcase, and which will remove the water content from the air included between the successive glass panels.

Another object of my invention is to provide a unit cartridge which will be so arranged that it will serve its intended purpose without providing an easy pass for the entrance of heat into the cabinet.

A further object of my invention is to provide means that will guide any liquification of the absorption cartridge into a sump contained within my device so that it will not flow out into the glassed-in compartments or into the case itself.

A further object of my present invention is to provide an absorption cartridge having a sump in which to collect the liquified cartridge material so that it may be all removed at once.

A further object of my invention is the provision of a plurality of finger portions of my unit container which can be extended into the glassed-in compartments and further assist in the extraction of moisture therefrom, particularly when the glass panels are of considerable length, and yet be all removed as one unit for cleaning or renewing the cartridge.

Other and more specific objects will be apparent from the following description taken in connection with the drawings, wherein

Figure 1 is a perspective view of a display cabinet of the type to which my device is adaptable, and showing the position normally occupied by my device.

Figure 2 is a typical cross-sectional view through a portion of the refrigerating cabinet of Figure 1, showing the plurality of glassed-in air compartments, with the refrigerating coils inside the showcase and the means employed for supporting the food products in close proximity to the inspection window.

Figure 3 is a sectional view taken along a longitudinal plane through one of the glassed-in compartments.

Figure 4 is a cross-sectional view taken substantially along the line 4—4 of Figure 3.

Figure 5 is a cross-sectional view through the opposite end of the cabinet as that shown in Figure 2, so as to show in the background the perforated end of my removable cartridge.

Figure 6 is a face view of my cartridge as viewed from the air induction side thereof, with the cartridge inclined to the angle at which it will normally be installed and showing the line of the sump and the degree to which it may be filled before it will overflow.

Figures 7, 8 and 9 are fragmentary views of a modified form of my device in which fingers are provided which extend outwardly into the air chambers between the glass panels; Figure 7 is a front view, partly in section, taken in a plane parallel to the sloping front of the cabinet; Figure 8 is a cross-sectional view taken substantially along the line 8—8 of Figure 7; Figure 9 is a cross-sectional view taken along the line 9—9 of Figure 8.

Figure 10 is a cross-sectional view taken along the major axis of my device, showing the unit as of Figure 6 in sectional view to better illustrate its construction.

Figure 11 is a cross-sectional view taken along the line 11—11 of Figure 10.

Figure 12 is a sectional view taken along the line 12—12 of Figure 10, but shown on a reduced scale.

Referring to the drawings, throughout which like reference characters indicate like parts, 14 designates my unit generally. It consists of an outer cover member 16 made usually of wood or dense press-board over which is formed preferably a metal covering 18 which is turned down on the edges so it will form an attractive, protective covering, and also to assist in protecting and securing a resilient gasket as 20 usually made of rubber or similar material, so as to form a hermetic seal when pressed snugly into place.

My device is provided with chamber 22 filled with a suitable insulating material of a thickness comparable to that of the refrigerator or at least equalling the same in efficiency. This is housed in either a wood frame box 24 or made of some suitable composition, as plastic materials, the dense pressed woods or any material having a very low coefficient of heat transmission. To cover 26 of compartment 22 is secured a metal box 28, which provides the cartridge receiving chamber 30. In here I place any of the proved types of liquid absorption materials of which calcium chloride is representative. This is normally in cake or coarse granulated form for ease of handling. It is then necessary to provide ready contact between this cartridge and the air in the compartments formed as by the glass panels 32, 33, 34, 35 and 36. Two methods have presented themselves; one is merely to provide a plurality of holes or openings 38, having these disposed in rows so that when a cartridge is in place each row of holes will be substantially centered on the compartments formed by the glass panels.

It will be noted, particularly in Figures 6, 10 and 11, that the rows of holes extend only to a predetermined horizontal line as 40, so that the portion of chamber 30 below this line will be a closed sump in which any materials which have been liquefied will drain and be held until disposed of. It is further very desirable that the cartridge material, when reduced to a liquid by moisture absorption, will not run down the covering plate or plates as 42 and 43, and to this end I have provided screens as 45 and 46, which are spaced inwardly from the perforated metal plates so that any of the cartridge material which breaks down from the moisture content will run down the screen which is disposed behind the perforated plates and the slightly colored, syrupy material will not be visible through the display window of the case, but will drain down into the sump 48, where it will be retained.

In the form shown in Figure 6 the screens 45 and 46 are relatively close together so as to give an adequate screening of any broken-down material. In the form, however, shown in Figures 7 and 9, plate 42 and screen 45 will be disposed at the ends of the fingers 50 which are connected to my removable unit, and are filled with the moisture absorbing material. Each of these fingers must be provided at its outer extremity with the metal plate 42 and the inner screen 45. Then, where these join the main compartment 30, the second screen 46 and its protective plate 43 is disposed with cutouts therein so that the finger material can be joined with that of the cartridge. It is only in certain types of installations that these fingers are required but when these conditions are encountered, especially where the area of the air chambers is considerable, and the temperature ranges between the outside of the cabinet and the inside are considerable, then these become very desirable, and add a great deal to the efficiency of my unit, it having been found that these fingers extending into the air chambers are in position to take care of the air as it circulates within the single chamber, and in this way the moisture can be removed from the entire area in many cases more effectively than the conventional type of dehydrators, long used in ice boxes, which consist of a long tube lying in the bottom of the compartment between usually only two glass plates forming a single compartment. The circulation of the air within the sloping compartment works in conjunction with my removable cartridge much like the ice of a refrigerator or the cooling coils of an electric refrigerator. In this instance, a certain amount of heat is created in the chemical reaction involved by breaking down the moisture absorption material, and this induces a circulation of air that makes my device function in the manner required to be truly effective.

It will be understood, of course, that as soon as this cartridge has broken down it should be replaced with a new one. This is very easily accomplished with my present arrangement, as a spare cartridge can be immediately slipped into place when the used one is removed. Chamber 30 is then refilled with suitable new material and is available for reintroduction into the cabinet.

The foregoing description and the accompanying drawings are believed to clearly disclose a preferred embodiment of my invention, but it will be understood that this disclosure is merely illustrative and that such changes in the invention may be made as are fairly within the scope and spirit of the following claims.

I claim:

1. Dehydrating means for multiple paneled refrigerating cases of the type wherein a number of transparent walls spaced apart from each other are positioned in a case to form a plurality of adjacent separated dead air compartments having discharge passages, said means comprising a

removable container positioned in a wall of said case and having a perforate wall disposed adjacent to the said discharge passages from the dead air compartments, the perforations in said wall being grouped so that the perforations of an individual group lie substantially proximate to the discharge passages from a single dead air compartment, each group containing a greater number of perforations than the group interiorly disposed thereof, a reticulated moisture draining screen positioned near the interior of said perforate wall, an inner perforate wall in said container spaced from said first mentioned wall, a reticulated moisture draining screen adjacent the inner perforate wall, and a hygroscopic material in said container for absorbing moisture from said dead air compartments.

2. Dehydrating means for multiple paneled refrigerating cases of the type wherein a number of transparent walls spaced apart from each other are positioned in a case to form a plurality of adjacent separated dead air compartments having discharge passages, said means comprising a removable container positioned in a wall of said case and having a perforate wall disposed adjacent to the said discharge passages from the dead air compartments, the perforations in said wall being grouped so that the perforations of an individual group lie substantially proximate to the discharge passages from a single dead air compartment, each group containing a greater number of perforations than the group interiorly disposed thereof, an inner perforate wall in said container spaced from said first mentioned wall, a reticulated moisture draining screen adjacent the inner perforate wall, and a hygroscopic material in said container for absorbing moisture from said dead air compartments.

3. Dehydrating means for multiple paneled refrigerating cases of the type wherein a number of transparent walls spaced apart from each other are positioned in a case to form a plurality of adjacent separated dead air compartments having discharge passages, said means comprising a removable container positioned in a wall of said case and having a perforate wall disposed adjacent to the said discharge passages from the dead air compartments, the perforations in said wall being grouped so that the perforations of an individual group lie substantially proximate to the discharge passages from a single dead air compartment, each group containing a greater number of perforations than the group interiorly disposed thereof, and a hygroscopic material in said container for absorbing moisture from said dead air compartments.

4. Dehydrating means for multiple paneled refrigerating cases of the type wherein a number of transparent walls spaced apart from each other are positioned in a case to form a plurality of adjacent separated dead air compartments having discharge passages, said means comprising a removable container positioned in a wall of said case and having separate passage means disposed adjacent each said discharge passage from the dead air compartments, the cross-sectional area of the passage means associated with the dead air compartment progressively decreasing from the outermost zone of the innermost zone, and a hygroscopic material in said container for absorbing moisture from said dead air compartments.

5. Dehydrating means for multiple paneled refrigerating cases of the type wherein a number of transparent walls spaced apart from each other are positioned in a case to form a plurality of adjacent separated dead air compartments having discharge passages, said means comprising a removable container positioned in a wall of said case and having separate passage fingers disposed adjacent each said discharge passage from the dead air compartments, the cross-sectional area of the passage fingers associated with the dead air compartments progressively decreasing from the outermost zone to the innermost zone, and a hygroscopic material in said container for absorbing moisture from said dead air compartments.

OTTO J. VINCENT.