

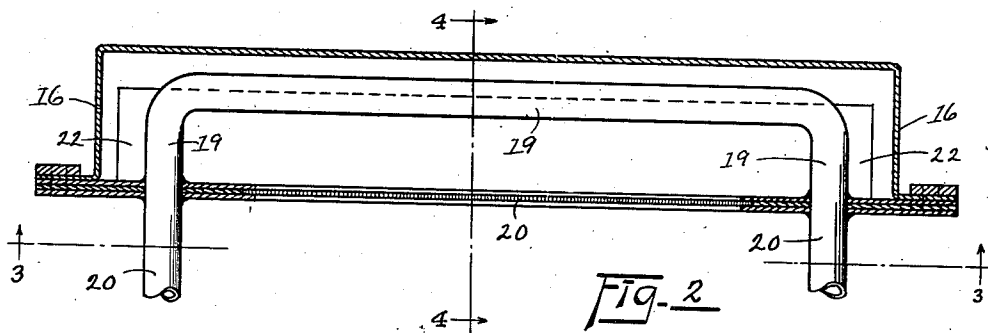
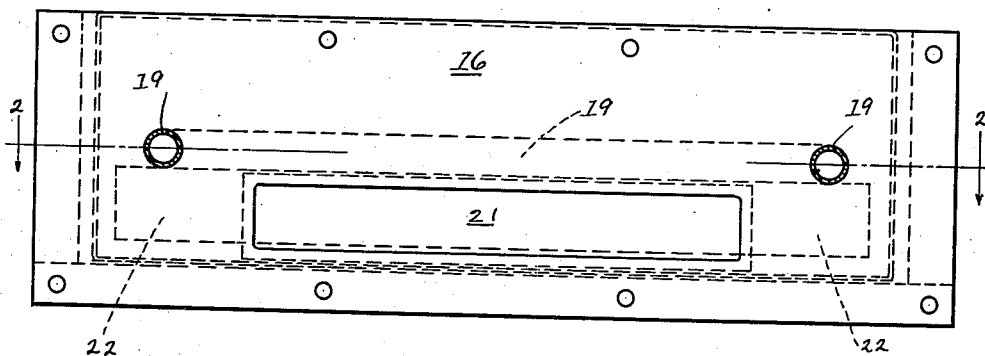
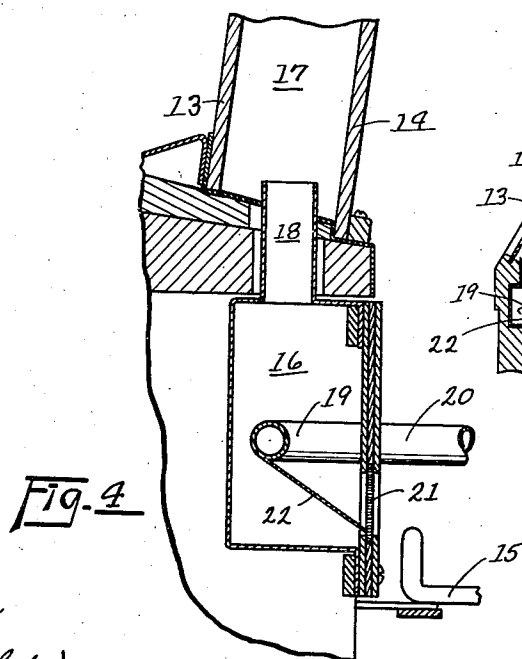
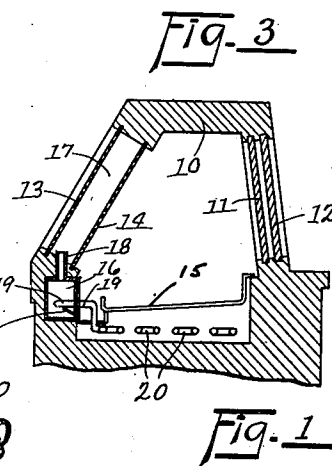
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G. J. HOPKINS

2,089,261

REFRIGERATOR CASE

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Witness:
Geo. L. Chapel

INVENTOR.
George J. Hopkins
BY *Rice and Rice*
ATTORNEYS.

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REFRIGERATOR CASE

George J. Hopkins, Kendallville, Ind., assignor
to McCray Refrigerator Company, Kendallville, Ind., a corporation of Indiana

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6 Claims. (Cl. 62—89.5)

The instant invention relates to refrigerator cases and more particularly to display refrigerators having spaced multiple panes of glass for permitting observation of food products within the refrigerator by prospective customers and purchasers thereof.

The primary objects of the present invention are to provide a display refrigerator case of the character above indicated whose spaced multiple panes of glass are maintained free from moisture condensation; to provide such a refrigerator whose cooling system maintains the spaced panes of glass free from moisture condensation; to provide such a refrigerator whose inter-glass space(s) is in communication with a refrigerating coil whereby the moisture of condensation is formed upon the coil and when dropped therefrom is conducted to an air tight plate between the inter-glass space and the interior of the refrigerator which plate is pervious to water permitting seepage of water of condensation therethrough; and, to provide such a refrigerator having a fin disposed below the coil for conducting the water of condensation from the coil to the plate.

An illustrative embodiment of the invention is shown in the accompanying drawing, wherein:

Figure 1 is a transverse sectional view of a refrigerator of the display type in which the inter-glass space between dual panes of glass is cooled by a refrigerating coil for the purpose of maintaining the glass free from moisture condensation;

Figure 2 is an enlarged fragmentary sectional view on line 2—2 of Figure 3 showing a portion of the refrigerating coil passing below the inter-glass space and in communication therewith;

Figure 3 is a sectional view thereof on line 3—3 of Figure 2; and

Figure 4 is a sectional view on line 4—4 of Figure 2.

Referring to the drawing in which like parts of the structure there shown are designated by the same numerals in the several views, the refrigerator case 10 is of the conventional display type, here shown as provided with sliding doors 11, 12 giving access to the interior thereof and having insulated dual spaced panes of glass 13, 14 to enable prospective customers and purchasers to view the food displayed therein upon the racks 15. This refrigerator case is provided with dual spaced panes as hereinbefore indicated but it will be understood of course that triple or other multiple spaced panes may be used if desired.

A reservoir 16 is preferably though not necessarily provided and is disposed below the inter-

glass space 17 defined by the panes 13, 14 and a tube 18 provides a port affording communication between the inter-glass space 17 and the reservoir 16.

A refrigerating coil 19, preferably leading from the main refrigerating coil 20 within the refrigerator case, circuitously passes into and out of the reservoir 16 and runs substantially the length thereof for cooling the inter-glass space 17 whose moisture laden air causes the moisture of condensation to deposit itself upon the portion 19 of the refrigerating coil 20 and thus maintain the spaced glass panes free from moisture condensation.

As above indicated, the reservoir 16 need not necessarily be employed. A refrigerating coil, either connected with the main coil within the refrigerator or entirely independent thereof, merely in communication with the inter-glass space 17 will likewise effectively cause the moisture of condensation to become deposited thereon.

An air tight plate 21 pervious to water is here shown as vertically disposed between the reservoir 16 and the interior of the refrigerator case 10 and an angularly disposed fin 22, preferably of metal, is disposed below and secured to the underside of the coil portion 19 for conducting fallen drops of water of condensation from the coil to the pervious plate through which seepage is permitted.

While it is quite possible other materials, either natural or synthetic, as well as combinations of such materials, might effectively serve to compose the plate 21 whereby it is pervious to water though impervious to air, it has been found that a mixture of silica gel, alumina gel or similar microscopically porous fine crushed powder, with a binder of a suitable material such as hard rubber, ideally serves the purpose. The proportion of the porous colloidal material to the binder should not be less than ten per cent, but may be increased according to the nature of the material used and its fineness wherever it is, for instance, desired to increase the structural strength of the finished sheet or plate.

Operation

In operation as will be understood to those familiar with the refrigeration art, the coldest place in the refrigerator is the refrigerating means, which in this instance are the coils 20 and their portion 19 running through the reservoir 16. Air adjacent the refrigerating coils is thus cooled by convection and since cold air is unable to retain as much moisture as warmer air, some

of the moisture normally retained by such warmer air is caused to be deposited upon the coils to the point of saturation for the resulting temperature.

Thus since the air in the warmer inter-glass space 17 is free to pass over the portion 19 of the coils 20 and since the warmer air is gradually cooled by convection currents thus set up, the moisture flows toward the portion 19 of the coils 20 and will condense thereon rather than upon the spaced panes of glass to cloud them and thereby prevent a clear view of the food displayed within the refrigerator.

When the moisture thus forming on the portion 19 of the coils 20 increases sufficiently to form large drops of water, the drops of water thus formed will follow the angularly disposed fin 22 which conducts the water to the vertically disposed pervious plate 21 through which seepage is permitted. Stated otherwise, refrigerating coils are used in commercial refrigerators such as refrigerators of the display type which is shown in the drawing, the temperature of the refrigerator coils is below 32° F. during the time the refrigerating mechanism is in operation. Such mechanism is, of course, not in continuous operation since a continuous operation of the refrigerating mechanism would cause the refrigerating coils to accumulate ice which would make the refrigerator inoperative due to the insulating coating of ice. To prevent such coating of ice the refrigerating mechanism is automatically controlled by gas pressure in order that the mechanism may be caused to operate periodically.

Thus during the time the refrigerating mechanism is inoperative any ice on the refrigerating coils is melted and since the switch mechanism remains open until the pressure rises above that corresponding to a temperature which will insure the melting of all of the accumulated ice on the refrigerating coils, ice thereon will not again form until the switch has been closed and the refrigerating mechanism has again been in operation for some time, after which the cycle of inoperation is again repeated.

It will thus be seen there are alternate periods during which the refrigerating coils are cold enough to chill the atmosphere surrounding them and condense sufficient moisture to bring the local dew point temperature well below the temperature of the glass panes. This condensation of the surrounding moisture on the tube 19 dries the atmosphere and thus upsets the equilibrium of the water vapor in the air imprisoned within the inter-glass space 17, which air is caused to be diffused downwardly in equalizing the humidity condition, thus gradually bringing all of the very small quantity of water within the inter-glass space into contact with the coil when it becomes frozen thereon during the cycle of operation of the refrigerating mechanism. During the off-cycle or inoperation of the refrigerating mechanism the tube 19 warms up causing the ice thereon to melt and run down the fin 22 to the pervious plate 21 through which seepage of the water is permitted by the evaporation on the opposite side of the pervious plate 21 and into the refrigerator portion of the case.

Moisture condensation on the insulated glass panes is thus effectively prevented and while but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a refrigerating coil positioned to refrigerate the inter-glass space, and an air tight plate pervious to water disposed between the coil and the interior of the refrigerator permitting seepage of water of condensation from the coil therethrough.

2. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a refrigerating coil positioned to refrigerate the inter-glass space, an air tight plate pervious to water disposed between the coil and the interior of the refrigerator permitting seepage of water of condensation from the coil therethrough, and a fin disposed below the coil for conducting drops of water of condensation from the coil to the plate.

3. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a reservoir communicating with the inter-glass space, a refrigerating coil therein, and an air tight plate pervious to water disposed between the reservoir and the interior of the refrigerator permitting seepage of water of condensation from the coil therethrough.

4. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a refrigerating coil within the refrigerator having a portion thereof positioned to refrigerate the inter-glass space, and an air tight plate pervious to water disposed between said portion of the coil and the interior of the refrigerator permitting seepage of water of condensation from said portion of the coil therethrough.

5. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a reservoir communicating with the inter-glass space, a refrigerating coil within the refrigerator having a portion thereof passing through the reservoir, and an air tight plate pervious to water disposed between said reservoir and the interior of the refrigerator permitting seepage of water of condensation from said portion of the coil therethrough.

6. In a display refrigerator case having dual spaced panes of glass defining an inter-glass space, a reservoir disposed below and communicating with the inter-glass space, a refrigerating coil within the refrigerator having a portion thereof passing through the reservoir, and an air tight plate pervious to water disposed between said reservoir and the interior of the refrigerator permitting seepage of water of condensation from said portion of the coil therethrough.

GEORGE J. HOPKINS.