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CONDENSATION PREVENTING MEANS FOR REFRIGERATORS

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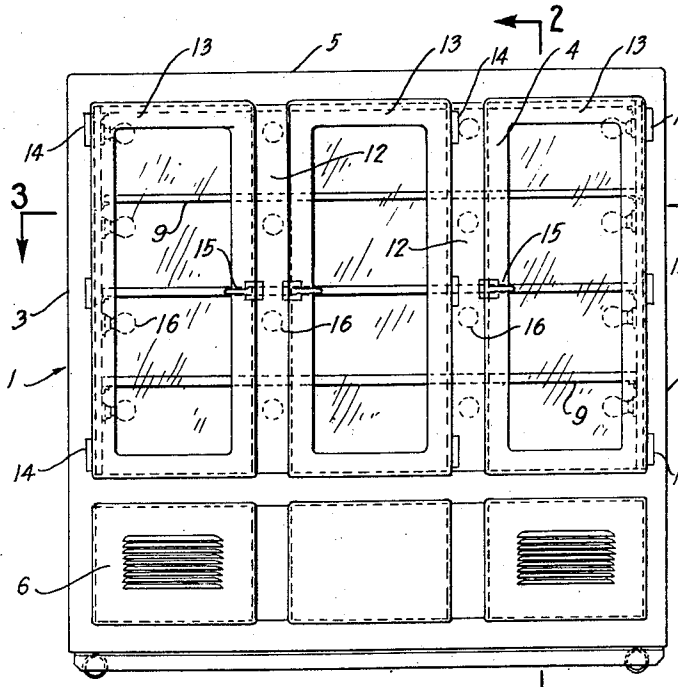


Fig. 1.

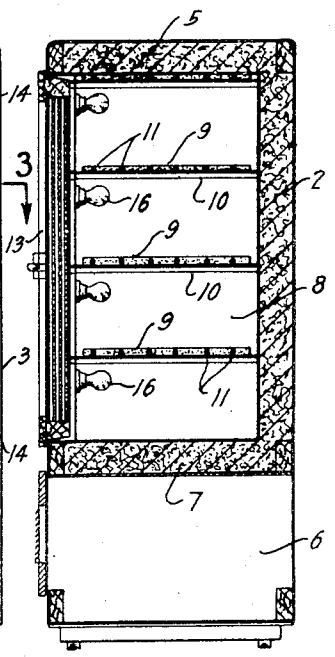


Fig. 2

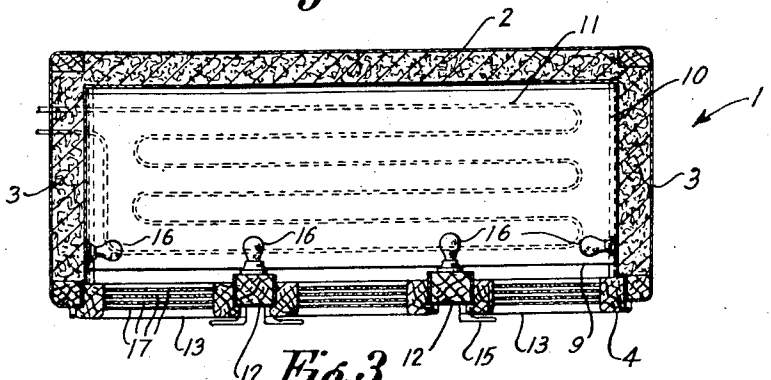


Fig. 3.

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CONDENSATION PREVENTING MEANS FOR REFRIGERATORS

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5 Claims. (Cl. 62—89)

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The present invention relates to improvements in condensation preventing means for refrigerators, and has particular reference to reach-in frozen food cabinets used principally in stores for storing and exhibiting to customers packaged frozen foods.

More particularly my invention has reference to cabinets of the character described which have swinging doors in the front wall thereof, the doors being provided with transparent panels to allow the customer to inspect the goods displayed and to open the doors for removing selected packages, the cabinet being provided with a plurality of shelves rendering the individual packages more easily accessible.

One of the most attractive features of a frozen food cabinet of this character, as compared with the conventional cabinets equipped with sliding doors in the top surface, is the facility with which the packages may be examined from the outside without opening the doors, and the ease with which they may be selected and removed by the customer.

The temperature in these cabinets is usually kept around zero, and I have found that due to the great difference in temperature between the inside of the cabinet and the outside atmosphere, when the door is opened the moisture of the outside air will rapidly condense on the inner surface of the glass or other transparent material used in a door and that when the door is closed again this moisture will freeze on the glass and thus render the latter non-transparent, which defeats one of the main purposes of using glass doors.

It is the object of the present invention to overcome this difficulty and to provide means whereby the condensed moisture is carried away from the inside of the glass panel immediately upon the closing of the door and before it has had time to freeze on the panel and to form a non-transparent layer of frost thereon.

For this purpose it is proposed to provide localized means for heating the front portion of the cabinet adjacent the door or doors and to cause a draft of heated air to rise along the inner face of the door for carrying away the moisture and depositing it at a point where the formation of frost does no harm.

It is further proposed to arrange the heating means in such a manner that it does not interfere with the handling of the packages and remains unaffected by the opening and closing of the door.

It is a further object of the invention to provide

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means whereby the heat draft is distributed over the glass panel area with substantial uniformity so as to substantially clear the entire area of the moisture when the door is closed.

And finally, it is proposed to utilize a heating means which at the same time serves to illuminate the entire cabinet and to thus display the packages to better advantage for inspection from the outside of the cabinet.

Further objects and advantages of my invention will appear as the specification proceeds, and the novel features of my invention will be fully defined in the claims attached hereto.

The preferred form of my invention is illustrated in the accompanying drawing, in which

Figure 1 shows a front view of my cabinet;

Figure 2, a vertical section taken along line 2—2 of Figure 1; and

Figure 3, a horizontal section taken along line 3—3 of Figure 1.

While I have shown only the preferred form of my invention, I wish to have it understood that various changes and modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawings in detail, my cabinet 1 is preferably made rectangular in form and of substantial height, the cabinet including a rear wall 2, side walls 3, a front wall 4 and a top 5, all made of conventional construction and being heavily insulated, as shown.

The lower portion of the cabinet generally indicated at 6 is reserved, in a conventional manner, for refrigerating apparatus, not shown. Above the refrigerating compartment is disposed an insulated horizontal wall 7 forming the bottom of the storage compartment indicated at 8.

The latter is provided with a plurality of conventional shelves 9 arranged in vertically spaced relation and supported on suitable angle irons 10 running along the side walls of the compartment. The shelves have evaporator coils 11 imbedded therein to allow a refrigerant to circulate therethrough in a conventional manner.

The front wall is made up substantially of a number of mullions 12 serving as anchoring means and abutments for the doors 13, suitably hinged as at 14 and adapted to be locked in closed position by suitable latches 15.

Each of the mullions has a plurality of electrical light bulbs 16 mounted on the inner face thereof, the light bulbs being preferably arranged in fairly close proximity to the front wall and being preferably distributed so that one bulb

is provided on each mullion for each space between two shelves. The light bulbs should preferably be positioned sufficiently high with respect to the shelves next below so that the packages on each shelf clear the light bulb and may be moved back and forth without striking the latter. Similarly positioned light bulbs are preferably mounted on the side walls, as shown.

Each door is formed with a number of spaced glass panels 17, extending preferably through the major portion of the door.

It will be noted, particularly upon inspection of Figures 2 and 3, that the shelves 9 are constructed to stop short of the front and rear walls of the cabinet.

In operation, with the light bulbs lit, the front portion of the cabinet will be heated. When the door is opened and moisture settles on the inner face of the glass panel, and the door is then closed again, heated air will rise along said inner face and will immediately entrain and remove the moisture before it can freeze on the glass panel. The moisture is carried away and deposited in some other part of the cabinet where it does not interfere with visibility. In the use of my cabinet I find that a certain amount of excess frost collects on the front edges of the shelves, and it may be assumed that most of the moisture is deposited on the front edges of the shelves.

Particular attention is called to the fact that the shelves, being slightly spaced from the front wall, serve to form a draft passage for the heated air and at the same time serve to spread the rising air into a relatively narrow passage for uniform disposition over the entire panel area. It should also be noted that due to this construction the heated draft is substantially confined to the area immediately adjacent the doors, and that little heat spreads into the interior of the cabinet.

Since the rear edges of the shelves are spaced from the rear wall, a return draft passage is set up along the latter.

While the bulbs thus serve to keep the glass panels clear of frost they serve the further purpose of illuminating the inside of the cabinet and to allow the entire contents of the cabinet to be easily surveyed from the outside.

It stands to reason that a somewhat increased freezing capacity is needed to make up for the heating but this feature is clearly outweighed by the advantages gained.

I claim:

1. A frozen food cabinet having a front wall with a transparent door therein adapted to collect moisture on the inner face thereof when open, shelves mounted in the cabinet, and heating means mounted within the cabinet adjacent the door to set up an upward draft along the inside of the closed door for entraining the moisture and for preventing the formation of frost upon the inner face of the door, the front edges of the shelves being slightly spaced from the closed door to present narrow draft passages tending to spread the draft over the entire door area.

2. A frozen food cabinet having a rear wall, a front wall with a transparent door therein adapted to collect moisture on the inner face thereof when open, shelves mounted in the cabinet, and heating means mounted within the cabinet adjacent the door to set up an upward draft along the inside of the closed door for entraining the moisture and for preventing the formation of frost upon the inner face of the door, the front edges of the shelves being slightly spaced from the closed door to present narrow draft passages tending to spread the draft over the entire door area, and the rear edges of the shelves being slightly spaced from the rear wall to provide a return draft passage.

3. A frozen food cabinet having a front wall with a transparent door therein adapted to collect moisture on the inner face thereof when open, shelves mounted in the cabinet, and heating means mounted within the cabinet adjacent the door to set up an upward draft along the inside of the closed door for entraining the moisture and for preventing the formation of frost upon the inner face of the door, the front edges of the shelves being slightly spaced from the closed door to present narrow draft passages tending to spread the draft over the entire door area, the heating means being operative to illuminate the inside of the cabinet for display purposes.

4. A frozen food cabinet having a rear wall, a front wall with a transparent door therein adapted to collect moisture on the inner face thereof when open, shelves mounted in the cabinet, and heating means mounted within the cabinet adjacent the door to set up an upward draft along the inside of the closed door for entraining the moisture and for preventing the formation of frost upon the inner face of the door, the front edges of the shelves being slightly spaced from the closed door to present narrow draft passages tending to spread the draft over the entire door area, and the rear edges of the shelves being slightly spaced from the rear wall to provide a return draft passage, the heating means being operative to illuminate the inside of the cabinet for display purposes.

5. A frozen food cabinet having a front wall with a transparent door therein adapted to collect moisture on the inner face thereof when open, shelves mounted in the cabinet, and heating means mounted within the cabinet adjacent the door to set up an upward draft along the inside of the closed door for entraining the moisture and for preventing the formation of frost upon the inner face of the door, the front edges of the shelves being slightly spaced from the closed door to present narrow draft passages tending to spread the draft over the entire door area, the heating means comprising electrical light bulbs mounted on opposite sides of the door and between the shelves so as to clear the door openings.

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