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REFRIGERATED DISPLAY CABINET FOR FROZEN FOOD

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2 Sheets-Sheet 1

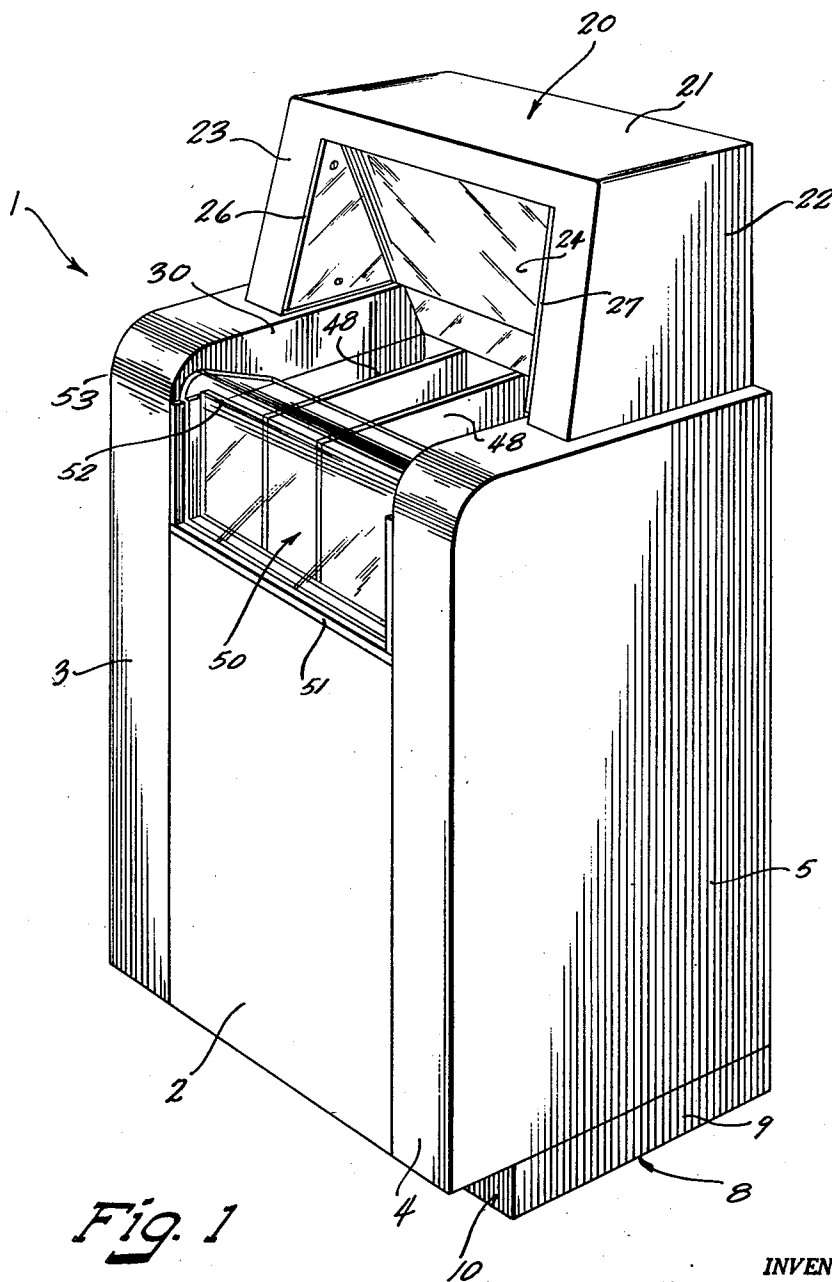


Fig. 1

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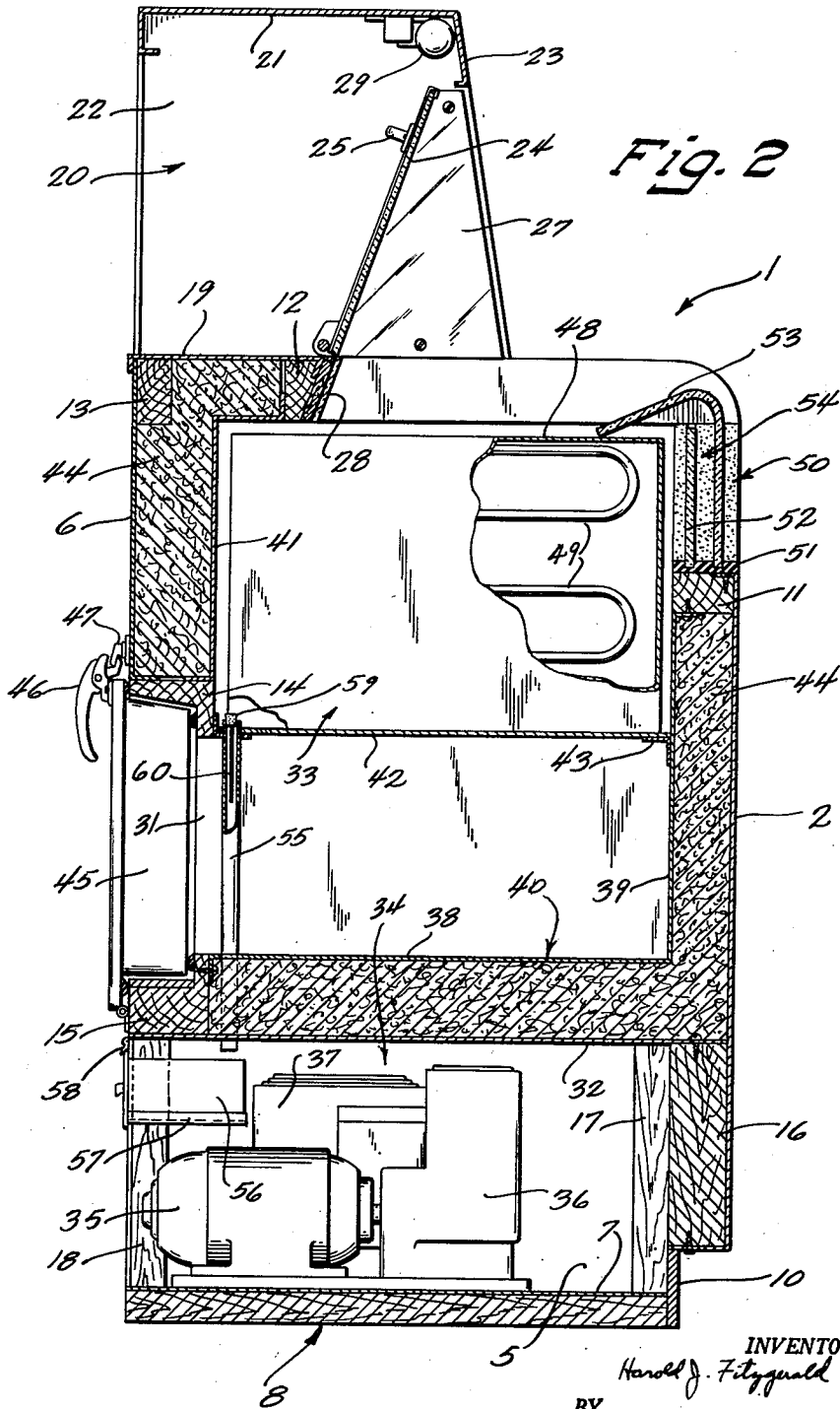
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## UNITED STATES PATENT OFFICE

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REFRIGERATED DISPLAY CABINET FOR  
FROZEN FOOD

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8 Claims. (Cl. 62—89.5)

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This invention relates to display cabinets for frozen food stuffs and it more specifically resides in a refrigerated compartment open at the top having a wall comprised of inner and outer transparent panes spaced from one another with the outer pane turned inwardly to pass above and over the upper edge of the inner pane and then downwardly toward the interior of the cabinet to provide ready access to the compartment, the transparent panes forming a still air chamber that is closed along the bottom and sides and that has an entrance at the top opening upon the compartment.

The distribution of confections in lobbies and foyers of recreation and amusement establishments such as clubs, theaters, sports arenas and the like may be promoted to a considerable extent through the proper utilization of eye appealing displays. Not only the packaging of the goods should be attractive, but the display background may be employed to great advantage by the use of artful design intended to initially catch and retain the interest of the eye. From the display background the eye of a prospective purchaser may be led to and focused upon the goods.

In the instance of frozen confections it has been the usual practice to set the goods within a well-like refrigerated compartment, the walls of which obstruct the line of sight of a purchaser. Not until one stands in the near immediate presence of the compartment may the goods be observed. This nullifies to considerable extent the eye appealing attractiveness of the packaging for the confections. It would be of advantage to display these particular goods in a compartment that does not obstruct a view thereof and which compartment forms with a display cabinet an overall attractive setting for the goods.

It is an object of this invention to provide in a display cabinet for frozen food stuffs a refrigerated compartment having side walls of transparent material through which the goods therein may be viewed without obstruction of vision.

It is another object of this invention to provide a transparent wall for a refrigerated compartment of novel configuration that inhibits the forming of condensation and frost which would otherwise impair the transparency of the wall.

It is still another object of this invention to provide a display cabinet having a refrigerated compartment with a normally open top and a transparent side wall of attractive appearance pleasing to the eye.

It is a further object of this invention to provide in a refrigerated compartment for frozen

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foods a still air chamber opening upon the refrigerated space of a frozen food compartment that forms a part of the compartment walls.

These and other objects and advantages of this invention will appear in the description to follow. In the description reference is made to the accompanying drawings which form a part hereof and in which there is shown by way of illustration and not of limitation one specific form in which this invention may be embodied.

In the drawings:

Fig. 1 is a view in perspective of a display cabinet for frozen foods that has a refrigerated compartment in which this invention is embodied, and

Fig. 2 is a side view in cross section of the display cabinet shown in Fig. 1.

Referring now to the drawings, there is shown in Fig. 1 a display cabinet 1 for the storage and display of frozen food products. The exterior of the cabinet 1 has a central front panel 2 flanked at each side by narrow side front panels 3 and 4 that each extend upwardly beyond the central panel 2 and curve rearwardly with a horizontal extension that forms a side margin of the top of the cabinet 1. A pair of side panels 5 each join respectively with the top and front edges of one of said front panels 3 and 4. A back panel 6, shown in Fig. 2, extends between the rear edges of the side panels 5 and extends from the top of the cabinet 1 downward for approximately one-third the height of the cabinet 1.

A floor 7 is provided for the cabinet 1 which forms a part of a base 8 that has a pair of side members 9 which are flush with the side panels 5 to form extensions thereof and a front member 10 stepped back from the front panels 2, 3 and 4.

A suitable framework is provided for the support and mounting of both the exterior and interior panels that form the cabinet walls. In Fig. 2 there is shown in section a number of the crosswise extending braces and frames that form a part of the framework. A front brace 11 to which the upper margin of the front panel 2 is secured extends for the width of the cabinet 1 and is disposed at a point approximately one-fourth the height of the cabinet 1 beneath the top thereof. A pair of upper braces 12 and 13 to which the rearward extensions of the front side panels 3 and 4 are secured are disposed toward the back of the cabinet 1, a pair of horizontal door frames 14 and 15 that outline an opening directly beneath the back panel 6 are disposed at the rear of the cabinet 1 and a cross beam 16 is disposed behind and supports the lower margin of the front panels 2, 3 and 4. At each corner of the floor 7 rises a vertical post to which are

secured the cross members described. In Fig. 2 there is shown the lower portions of two of these posts 17 and 18.

A top panel portion 19 extending between the rear portions of the horizontal extensions of the side front panels 3 and 4 turns over and laps about the upper forward edge of the cross brace 12 and extends rearwardly to turn and lap over the upper edge of the back panel 6. The top panel portion 19 thus forms with the horizontal portions of the front side panels 3 and 4 a cabinet top that borders three sides of the top to frame a large opening that enters upon the cabinet interior.

Mounted atop the cabinet 1 is a hood 20 that has a horizontal top 21 and a pair of sides 22. A three sided frame 23 forms a front for the hood 20 and within the hood 20 is an obliquely disposed upwardly and forwardly extending mirror 24. The mirror 24 is hinged to swing about the bottom edge thereof. A handle 25 on the mirror 24 affords a means for manipulating the mirror from the position shown in the drawings to a horizontal position that provides for access to the interior of the cabinet 1 by an attendant standing behind the apparatus. A pair of side mirrors 26 and 27 extend rearwardly from the inner vertical edges of the three sided frame 23 and the rear edges of the mirrors 26 and 27 extend obliquely to retain the mirror 24 in position. A strip of mirror 28 is mounted along the forward surface of the cross brace 12 and a suitable lamp 29 is disposed directly behind the crosswise portion of the three sided frame 23, the light from which passes downwardly to the front of the mirror 24 to illuminate the upper interior of the cabinet 1.

A pair of inner side walls 30 and 31 each spaced respectively from the exterior side panels 5 extending from the top of the cabinet 1 downwardly to a line common with the top edge of the cross beam 16. A horizontal partition 32 resting at its forward margin upon the cross beam 16 and secured at its after margin to the lower door frame 15 abuts against the lower edges of the inner side walls 30 and 31 divides the interior of the cabinet 1 into an upper compartment 33 which is to be refrigerated and a lower compartment 34, that is accessible from the open rear, for housing the necessary refrigeration apparatus. The refrigeration apparatus consists of a compressor motor 35, a compressor 36 and a condenser 37 which are shown schematically.

A flooring 38 and an inner front wall 39 for the refrigerated compartment 36 are formed from a single piece of sheeting 40 that extends crosswise between the inner side walls 30 and 31. The sheeting 40 is supported by attachment of the rear margin of the floor 38 to the lower door frame 15 and attachment of the upper margin of the front wall 39 to the front cross brace 11. An inner back wall 41 is attached at its upper margin to the cross brace 12 and extends downwardly to the upper door frame 14. A floor 42 that subdivides the refrigerated compartment 36 is disposed between the inner side walls 30 and 31 and is fastened to the upper door frame 14 and an angle brace 43 that is secured to the inner front wall 39. The voids between the respective inner and outer wall sections which comprise the cabinet 1 are filled with a suitable insulation 44 to retard heat transfer through the cabinet walls.

The lower section of the refrigerated compartment 33 disposed beneath the flooring 42 opens at the rear through the door frame comprised in

part by the horizontal upper and lower frames 14 and 15. An insulated door 45 is provided for the door frame and is hingedly mounted along its lower margin to the frame 15. A handle and latch 46 is mounted upon the door 45 and a latch keeper 47 is mounted upon the upper door frame 14 to provide a means for securing the door 45 in closed position.

The evaporator for the refrigeration apparatus is mounted upon the flooring 42. A pair of thin walled hollow partitions 48 spaced from one another and from the inner side walls 30 and 31 divide the upper refrigerated space above the floor 42 into three equal sized cavities. Within the partitions 48 are placed the evaporator coils 49 of the refrigerating apparatus. If it is desired to use a cooling medium other than the refrigerant in the refrigerated compartment 33, such as a brine which is itself cooled by the refrigerant, such medium may be passed through the coils 49 in lieu of the refrigerant.

In the practice of this invention a transparent wall forms a part of the refrigerated compartment 33 to enable a prospective purchaser of the goods on display within the cabinet 1 to view the same at a distance, without necessitating a close approach to the cabinet 1 for a view of the goods through the open top. In the drawings such a window wall 50 forms an upper extension of that wall formed by the front panel 2 and the inner front wall 39. A mounting frame 51, preferably of an insulating material, has a horizontal portion mounted upon the upper cross brace 11 and vertical portions fastened to the front margins of the inner side walls 30 and 31. The vertical portions of the frame 51 extend upwardly to the point at which the front side panel portions 3 and 4 break from the vertical into their rearward curve. The frame 51 is grooved to receive a pair of transparent panes 52 and 53. The inner pane 52 is fitted tightly within the frame 51 to form a barrier to the seepage of cold from within the refrigerated compartment 33. The outer pane 53 which is disposed in spaced relation to the front of the inner pane 52 extends upwardly beyond the upper extent of the inner pane 52 and bends rearwardly and downwardly, to pass above and over the upper edge of the inner pane 52 and to slope into the interior of the compartment 33. The rearward downwardly sloping extent of the outer pane 53 permits ready access to the compartment from the vantage point of a prospective purchaser standing to the face of the cabinet. Also, there is formed a still air chamber 54 between the transparent panes 52 and 53 that has an opening at the top that enters upon the refrigerated compartment 33.

Located at a rear corner of the compartment floor 42 is a drain tube 55 that extends downwardly through the lower section of the refrigerated compartment 33 and through the insulated wall formed between partitions 32 and 38 to open upon a defrost tray 56. The tray 56 may be slid from the rack 57 and a catch 58 retains the tray 56 in normally housed position. At the entrance of the drain tube 55 rests a floatable stopper valve 59 that is centered with respect to the tube 55 by a stem 60 that extends downwardly within the tube 55. Upon defrost, or power failure, the melted frost accumulating in the upper refrigerated compartment will float the valve 59 and flow into the defrost tray 56. The normally closed position of the valve 59 stoppers the tube 55, which would otherwise act

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as a leakage for cold air within the compartment 33.

The cooling effect of the refrigerated compartment extends upward above the interior of the cabinet. A cascading movement of cooled air across the surface of the outer transparent pane 53 and downwardly along the front of the cabinet is caused to occur as the air at the vicinity of the refrigerated compartment opening is cooled. An augmentation of this air movement is caused by the hood member 20, that is of heat conducting metallic material and joined to the refrigerated portion of the apparatus. The hood 20 channels the air movement and through its property of heat conduction aids to cool the air slightly to cause down draft toward the open compartment. A circulation pattern passing downward and to the front of the hood 20 and into the refrigerated compartment from which it pours, gently, out and over the outer pane 53 is developed. This air movement causes cooled air of low dew point to be led into the still air chamber 54 through the opening between the upper edge of the inner pane 52 and the rearwardly turned section of the outer pane 53. The downward and inward slant of the pane 53 enhances the entrapment of cooler air that is led to within the chamber 54.

With a cooled air of low dew point filling the chamber 54 formation of condensation and frost is inhibited. The chamber opening entering upon the refrigerated compartment 33 should be disposed at a level at which the air entrapped and led into the chamber 54 is at a temperature above freezing and at which the outer pane 53 will not be chilled to where condensation might form thereon.

I claim:

1. In a display cabinet for frozen food stuffs the combination comprising a floor, side wall panels joined to said floor and one another to form an open top compartment, one of said side wall panels comprising a transparent upwardly extending inner partition, and a transparent outer partition having a portion spaced from and in front of said inner partition rising above and turning inwardly over the upper margin of said inner partition, and a rearward extension extending downwardly beneath the upper edge of said transparent inner partition and inwardly to within said compartment, and refrigerating means including cooling coils in cooling relation to the interior of said compartment.

2. A display cabinet for frozen food stuffs in accordance with claim 1 having a back wall member extending upwardly above the upper extent of said transparent outer partition from the side of said cabinet opposite said transparent partitions.

3. A display cabinet for frozen food stuffs in accordance with claim 2 characterized by sealing means disposed between said inner and outer transparent partitions extending in a continuous strip from a point of commencement at the upper margin of said inner partition downwardly and horizontally and hence upwardly to a point of termination also at the upper margin of said inner partition forming a still air chamber between said partitions opening along the upper margin of said inner partition to the interior of said cabinet.

4. In a refrigerated compartment for frozen food stuffs the combination of a cabinet having a bottom and side, back and front walls joined to one another to form a compartment open at the

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top, said front wall including an upwardly extending transparent inner partition, and a transparent outer partition having an upwardly extending portion spaced to the outside of said inner partition to form a double walled window which portion rises above said inner partition and has a downwardly inwardly sloping portion extending from the upper margin of the upwardly extending portion to pass above and over said inner partition to beneath the upper edge of said inner partition and to within said compartment; a hood member extending upwardly from said compartment disposed to the rear of said front wall and comprising a baffle panel rising upwardly and forwardly from the rear of said compartment to a height above said transparent partitions and a pair of side panels joined to the side margins of said baffle panel and extending forwardly therefrom; and refrigerant ducts disposed in cooling relation to said compartment and adapted for flow of a cooling medium therethrough.

5. In a refrigerated compartment for frozen food stuffs the combination of a transparent side wall comprising an inner partition of transparent material having bottom, top and side margins, an outer partition of transparent material spaced outward from said inner partition having bottom and side margins aligned substantially with the bottom and side margins of said inner partition and having an upward extension turning over the top margin of said inner partition and sloping downwardly to the rear of said inner partition and sealing strips joining the respective side and bottom margins of said inner and outer partitions to form a chamber therebetween open between the top margin of said inner partition and the upward extension of said outer partition; a floor; side wall portions; said flooring and said side wall portions being joined with one another and with said transparent side wall to form a compartment open at the top; a drain duct opening upon said compartment extending to beneath the same; a floatable stopper valve seated within the opening of said duct having a centering stem extending within said duct; and refrigerant ducts disposed in cooling relation to said compartment and adapted for flow of a cooling medium therethrough.

6. A refrigerated compartment for frozen food stuffs in accordance with claim 4 wherein the baffle panel has a lower margin extending along the rear of said compartment and is pivotally mounted for rearwardly swinging movement of said baffle, and in which stop means are provided on said side panels against which said baffle panel may rest in said upward and forward position.

7. In a refrigerated compartment for frozen food stuffs the combination of a transparent side wall comprising an inner partition of transparent material having bottom, top and side margins, an outer partition of transparent material spaced outwardly from said inner partition having bottom and side margins aligned substantially with the bottom and side margins of said inner partition having an upward extension turning over the top margin of said inner partition and sealing strips joining the respective side and bottom margins of said inner and outer partitions to form a chamber therebetween open at the top; a floor; side wall portions; said flooring and said side wall portions being joined with one another and with transparent side wall to form a compartment open at the top; a drain duct opening upon said compartment extending to beneath the same; a floatable stopper valve seated within

the opening of said duct having a centering stem extending within said duct; and refrigerant ducts disposed in cooling relation to said compartment and adapted for flow of a cooling medium there-through.

8. In a refrigerated compartment for frozen food stuffs the combination of a cabinet having a bottom and side, back and front walls joined to one another to form a compartment open at the top, said front wall including an upwardly extending transparent inner partition and a transparent outer partition having an upwardly extending portion spaced to the outside of said inner partition to form a double-walled window which portion rises above and turns over said inner partition; a hood member extending upwardly from said compartment disposed to the rear of said front wall and comprising a baffle panel rising upwardly and forwardly from the

rear of said compartment to a height above said transparent partitions and a pair of side panels joined to the side margins of said baffle panel and extending forwardly therefrom wherein the baffle panel is pivotally joined with said side panels for a rearwardly swinging movement of said baffle; stop means on said side panels against which said baffle panel may rest in said upward and forward position; and refrigerant ducts disposed in cooling relation to said compartment and adapted for flow of a cooling medium there-through.

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