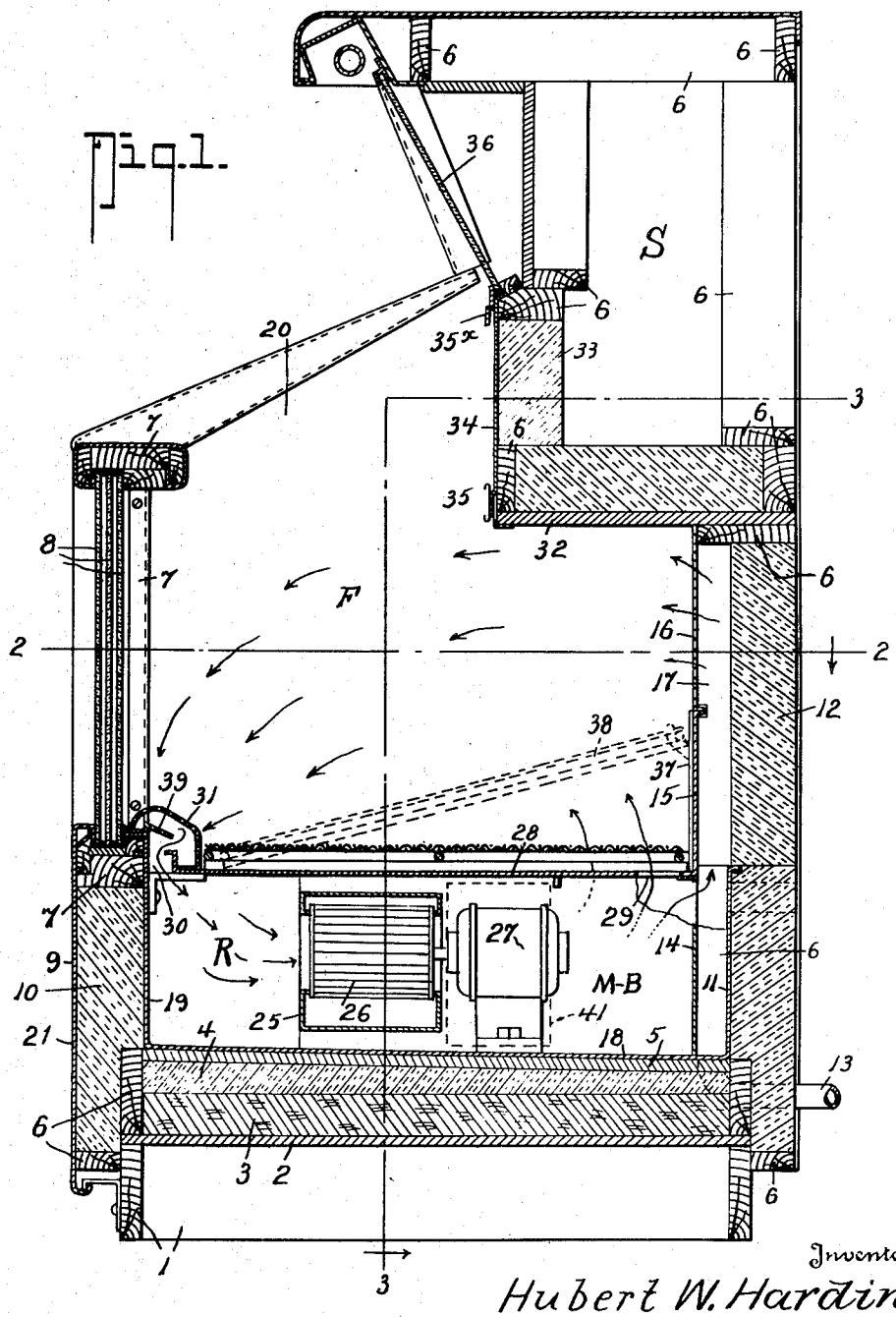
May 16, 1950 H. W. HARDIN 2,508,255

OPEN TOP REFRIGERATED DISPLAY CASE

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Fig. 1.



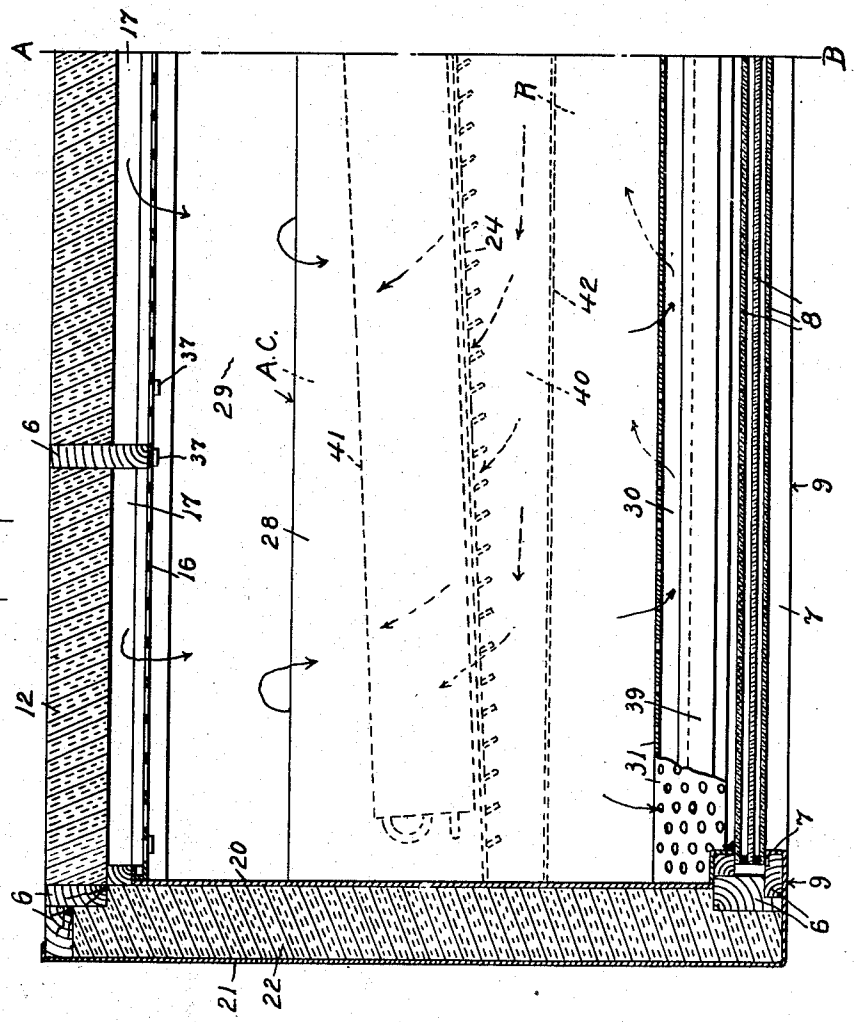
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OPEN TOP REFRIGERATED DISPLAY CASE

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Fig. 2A



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OPEN TOP REFRIGERATED DISPLAY CASE

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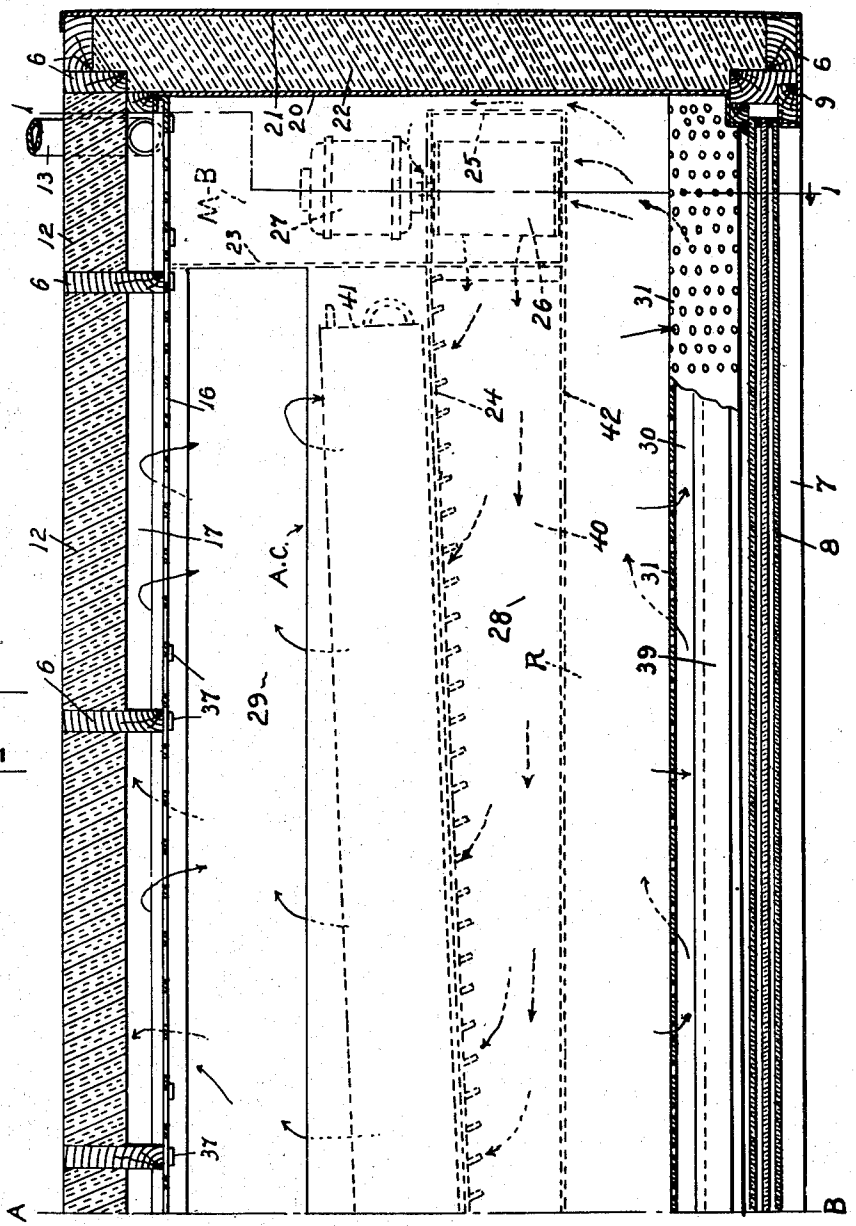


Fig. 2B

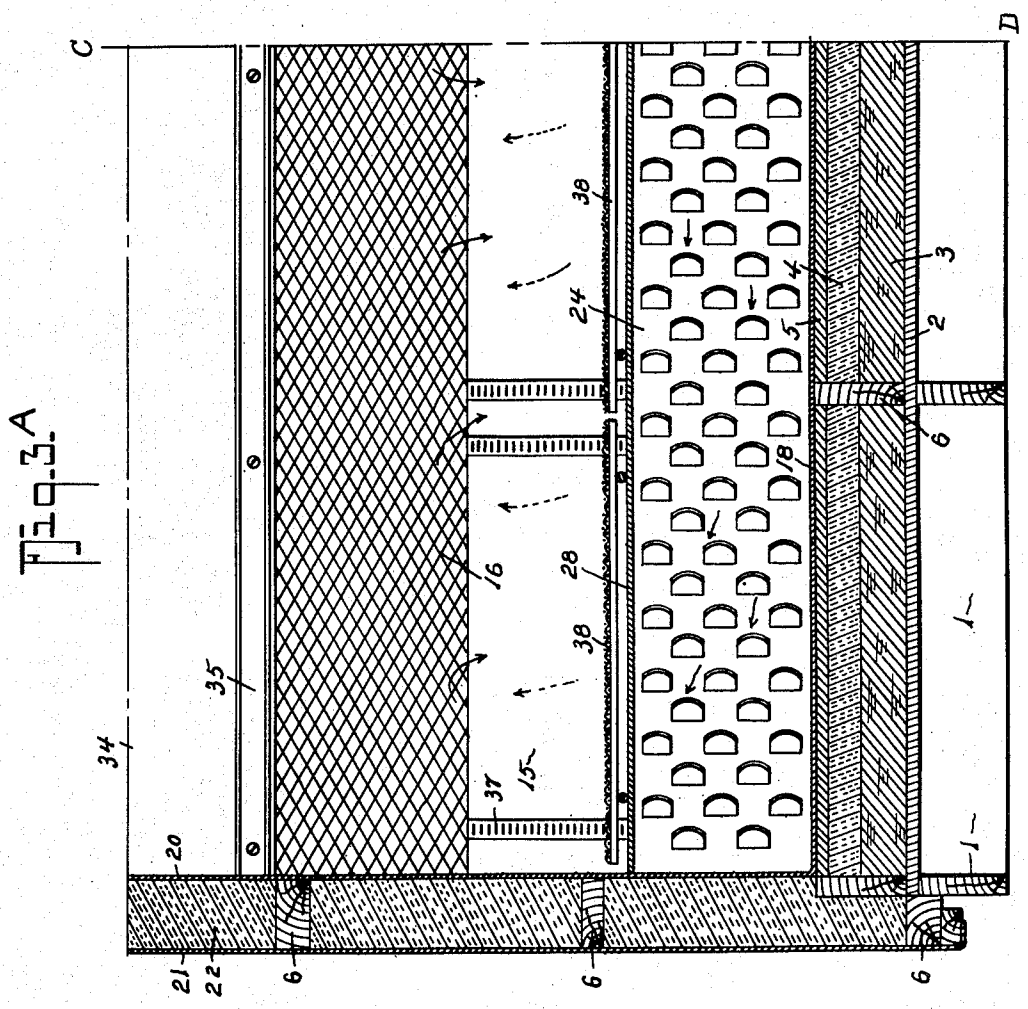
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May 16, 1950 H. W. HARDIN 2,508,255

OPEN TOP REFRIGERATED DISPLAY CASE

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Fig. 3A



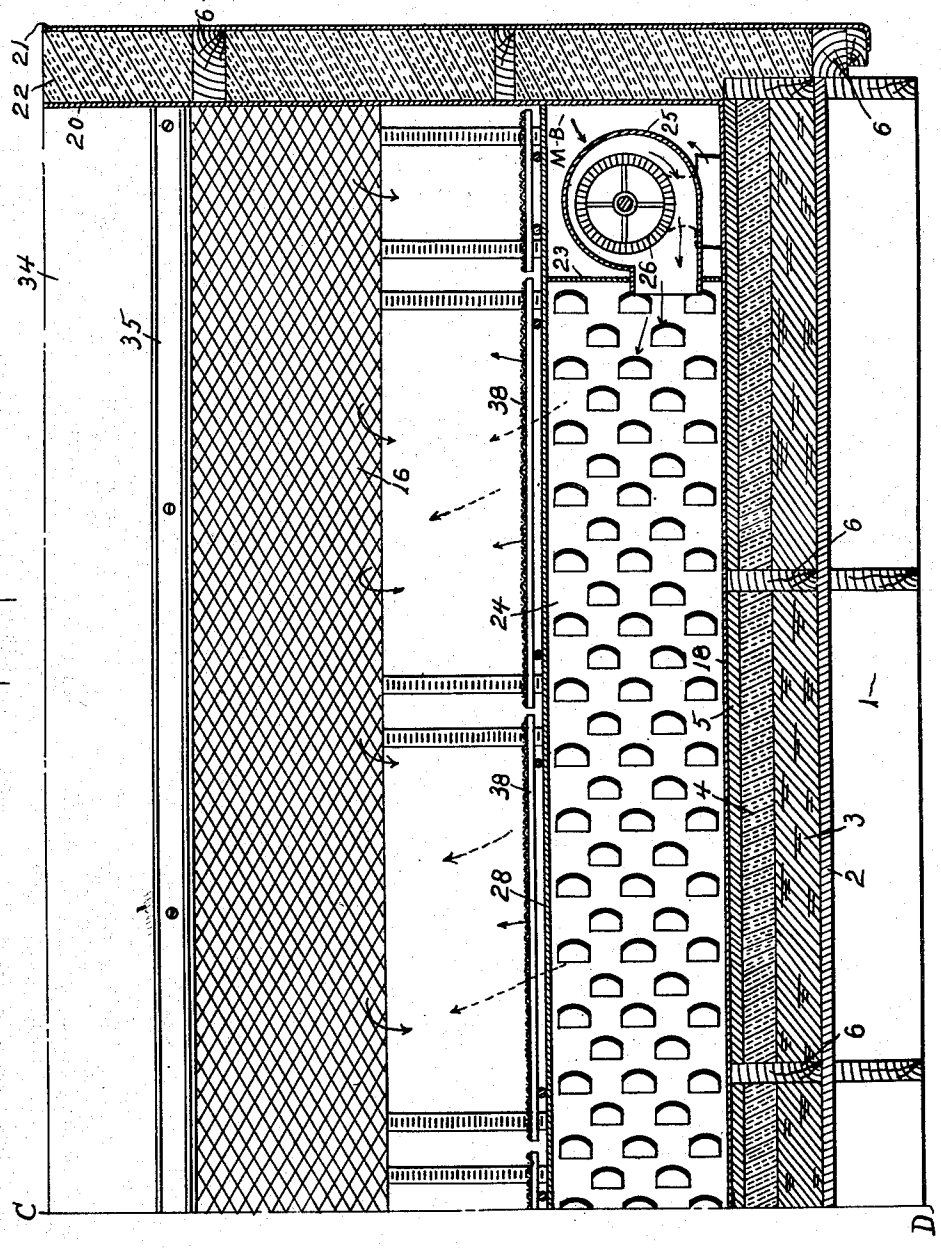
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OPEN TOP REFRIGERATED DISPLAY CASE

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Fig. 3B



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UNITED STATES PATENT OFFICE

2,508,255

OPEN-TOP REFRIGERATED DISPLAY CASE

Hubert W. Hardin, San Antonio, Tex., assignor to Ed Friedrich, Inc., San Antonio, Tex., a corporation of Texas

Application March 17, 1947, Serial No. 735,083

11 Claims. (Cl. 62—89.5)

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My invention which relates generally to the art of refrigeration, particularly has reference to that type of refrigeration in which the goods are displayed in such position that the customer may reach in through the top, which is always open, and serve himself or herself.

The present invention has for its objects:

1. To provide a case of the character above mentioned in which provision is made for a forced circulation of cold air up through and over the food on display in an effective and practical way.

2. To provide such as case in which the refrigerating coil and air circulator are located beneath the bottom of the display compartment and the cold air is passed over the food from the back to the front of the case.

3. To provide such a case in which the cold air does not spill over the front wall of the case and in which but little warm air enters the open top of the case while removing food from the case.

Other objects will be obvious to those skilled in the art.

To the attainment of the aforesaid objects and ends invention also resides in the novel details of construction, combinations and arrangements of parts all of which will first be described in detail and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings in which:

Fig. 1 is a cross section of a case embodying my invention, the section being taken on the line 1—1 of Fig. 2^B.

Figs. 2^A and 2^B, when joined on the line A—B, may be read as one and comprise a horizontal section on the line 2—2 of Fig. 1, the shelves being omitted.

Figs. 3^A and 3^B, when joined on the line C—D, may be read as one and comprise a vertical section on the line 3—3 of Fig. 1.

Referring now to the accompanying drawings in which like numerals and letters of reference indicate like parts in all the figures, 1 represents the base part of the frame of the case, the frame being composed of longitudinal, transverse and vertical beams 6. The bottom of the case is composed of a bottom panel 2 of fiber board such, for example, as that sold under the trade name "Celotex," a layer of cork insulation 3 and a layer of loose wool 4 over the cork and a floor board 5 of suitable material such, for example, as that sold under the trade name "Celotex."

The front wall of the case is composed of an inner metal sheath 19, an outer metal sheath 9, insulation 10 and a window frame 7 in which

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frame triple window panes 8 of transparent material are mounted. The back wall of the case is composed of insulation 12 and an inner metal sheath 11 at the lower level.

The back wall plate 14 is spaced from the rear wall and that space constitutes the cold air uptake duct 17. The bottom of the case is sheathed with a metal plate 18 over the fiber board 5.

An imperforate wall plate 15 extends from side to side of the case for about one-half the height of the food chamber F below the semi-ceiling, and within the adjustable limits of the back of the food shelf 38. To the plate 15 the shelf standards 37 are secured. Above the plate 15 is located a foraminous plate 16 (preferably of expanded metal). The plates 15 and 16 like plate 14 are spaced from the back wall. The plate 15 terminates at the floor 28 of the food compartment.

Below the window the front wall has an internal sheath of metal 19, the space between which and a longitudinally disposed vertical partition 42 constitutes the return air or suction duct R of the case. The bottom plate 28 of the food chamber has a wide slot 29 at the rear and is spaced from the front wall, as at 30, for air circulation purposes, as will later more fully appear. Over the opening 30 is a baffle plate 39 and a foraminous air duct guard 31. M–B indicates the combined motor and blower chamber.

The side walls of the case are composed of an inner metal sheath 20, an outer metal sheath 21 and interposed insulation 22.

23 is a transverse partition wall below the food compartment and extends from wall 42 to wall 14. The blower housing 25 delivers air through an opening in the wall 23 into the air distributing duct 40. The back wall of the duct 40 is formed by a finned apertured wall 24 through which air passes from the duct 40 into the air-cooling chamber A–C in which is located the refrigerating coil 41.

27 is an electric motor which operates the blower rotor 26.

The semi-ceiling consists of a cellulosic board or fiber board 32 secured to a portion of the framing, and extends from the back wall of the case toward the front wall a distance somewhat less than one-half way and at a lower level than the top of the window frame 7. The semi-ceiling is insulated as at 33.

34 is an upwardly extending bulletin plate, insulated as at 33. Located above the plate 34 is an inclined mirror 36.

A price tag holder 35 is secured to the lower

edge of the plate 34 and is offset therefrom to cooperate with the strip 35x at the top level of the plate 34 in holding display signs (not shown).

It is to be noted that the air distributing duct 40 is of progressively less cross sectional area from its entrant end to its far end so as to equalize the air passing through the finned wall 24 and the cooling coil 41.

In operation, with food in the chamber F and the motor 27 running and cooling coil energized, air is forced into duct 40 from which it passes via cooling chamber A—C, up through and around the food packages on shelf 38. Also cold air passes up duct 17 and through foraminous wall 16, flowing over the food packages to form a cool zone above the same. The air from the food chamber F is drawn forward through opening 30 into return-air duct R from which it is sucked into blower housing 25 by blower rotor 26, thus completing a circuit.

The guard 31 prevents the food stuff clogging the narrow passage 30.

As shown in dotted lines in Fig. 1 the shelf 38 may be held at an inclination to the horizontal when desired or it may be left lying flat as shown in full lines. When it is inclined the guard 31 will prevent the food packages sliding down and choking the return air passage 30.

By locating the semi-ceiling below the top level of the front wall and passing cold air forwardly under the semi-ceiling over the food, a cool air layer or zone will be maintained over the food and fully envelope the same.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, operation and advantages of the invention will readily appear to those skilled in the art.

What I claim is:

1. In an open top refrigerated display case wherein is provided a bottom, side walls, a back wall, a front wall having a window spaced above the bottom of the case, and a semi-ceiling extending forwardly from the back wall toward but short of said front wall and located at a level below and adjacent the level of the top of the front wall window; the improvement which comprises a food chamber within the confines of the case beneath said semi-ceiling and having a floor spaced above the bottom of the case proper, the floor of the food chamber having an elongated slot adjacent the back wall of the case and an elongated slot adjacent the front wall of the case, said slots communicating with the space between said floor and the bottom of the case, a longitudinal vertical partition extending from said semi-ceiling to the bottom of the floor of the food chamber and having perforations adjacent said semi-ceiling and being spaced from the back wall of the case to provide an uptake-air duct, an air-distributing duct extending longitudinally of the case below the floor of the food chamber, an air-cooling chamber below said floor and extending alongside said air-distributing duct, there being a foraminous wall between said ducts and a cooling coil adjacent said foraminous wall in the air-cooling chamber, a return-air duct between said air-distributing duct and the front wall of the case, said air-cooling chamber communicating with said food chamber via the rear slot in the floor of said food chamber and said uptake-air duct and said food chamber communicating with said return-air duct via the front slot in the floor of said food chamber, and means for circulating air through said ducts, said food chamber and said air-cooling chamber.

2. In an open top refrigerated display case wherein is provided a bottom, side walls, a back wall, a front wall having a window spaced above the bottom of the case, and a semi-ceiling extending forwardly from the back wall toward but short of said front wall and located at a level below and adjacent the level of the top of the front wall window: the improvement which comprises a food chamber within the confines of the case beneath said semi-ceiling and having a floor spaced above the bottom of the case proper, the floor of the food chamber having an elongated slot adjacent the back wall of the case and an elongated slot adjacent the front wall of the case, said slots communicating with the space between said floor and the bottom of the case, a longitudinal vertical partition extending from said semi-ceiling to the bottom of the floor of the food chamber and having perforations adjacent said semi-ceiling and being spaced from the back wall of the case to provide an uptake-air duct, an air-distributing duct extending longitudinally of the case below the floor of the food chamber, an air-cooling chamber below said floor and extending alongside said air-distributing duct, there being a foraminous wall between said ducts and a cooling coil adjacent said foraminous wall in the air-cooling chamber, a return-air duct between said air-distributing duct and the front wall of the case, said air-cooling chamber communicating with said food chamber via the rear slot in the floor of said food chamber and said uptake-air duct and said food chamber communicating with said return-air duct via the front slot in the floor of said food chamber, means for circulating air through said ducts, said food chamber and said air-cooling chamber, and a foraminous guard over said slot at the front of the floor of said food chamber.

3. In an open top refrigerated display case wherein is provided a bottom, side walls, a back wall, a front wall having a window spaced above the bottom of the case, and a semi-ceiling extending forwardly from the back wall toward but short of said front wall and located at a level below and adjacent the level of the top of the front wall window: the improvement which comprises a food chamber within the confines of the case beneath said semi-ceiling and having a floor spaced above the bottom of the case proper, the floor of the food chamber having an elongated slot adjacent the back wall of the case and an elongated slot adjacent the front wall of the case, said slot communicating with the space between said floor and the bottom of the case, a longitudinal vertical partition extending from said semi-ceiling to the bottom of the floor of the food chamber and having perforations adjacent said semi-ceiling and being spaced from the back wall of the case to provide an uptake-air duct, an air-distributing duct extending longitudinally of the case below the floor of the food chamber, an air-cooling chamber below said floor and extending alongside said air-distributing duct, there being a foraminous wall between said ducts and a cooling coil adjacent said foramionus wall in the air-cooling chamber, a return-air duct between said air-distributing duct and the front wall of the case, said air-cooling chamber communicating with said food chamber via the rear slot in the floor of said food chamber and said uptake-air duct and said food chamber communicating with said return-air

duct via the front slot in the floor of said food chamber, and means for circulating air through said ducts, said food chamber and said air-cooling chamber, said last named means comprising a motor and blower chamber in said case, a motor and blower in said motor and blower chamber, the blower delivering into one end of said air-distributing duct, said return-air duct communicating with said motor and blower chamber and said blower.

4. In an open top refrigerated display case wherein is provided a bottom, side walls, a back wall, a front wall having a window spaced above the bottom of the case, and a semi-ceiling extending forwardly from the back wall toward but short of said front wall and located at a level below and adjacent the level of the top of the front wall window: the improvement which comprises a food chamber within the confines of the case beneath said semi-ceiling and having a floor spaced above the bottom of the case proper, the floor of the food chamber having an elongated slot adjacent the back wall of the case and an elongated slot adjacent the front wall of the case, said slots communicating with the space between said floor and the bottom of the case, a longitudinal vertical partition extending from said semi-ceiling to the bottom of the floor of the food chamber and having perforations adjacent said semi-ceiling and being spaced from the back wall of the case to provide an uptake-air duct, an air-distributing duct extending longitudinally of the case below the floor of the food chamber, an air-cooling chamber below said floor and extending alongside said air-distributing duct, there being a foraminous wall between said ducts and a cooling coil adjacent said foraminous wall in the air-cooling chamber, a return-air duct between said air-distributing duct and the front wall of the case, said air-cooling chamber communicating with said food chamber via the rear slot in the floor of said food chamber and said uptake-air duct and said food chamber communicating with said return-air duct via the front slot in the floor of said food chamber, and means for circulating air through said ducts, said food chamber and said air-cooling chamber, said last named means comprising a motor and blower chamber in said case, a motor and blower in said motor and blower chamber, the blower delivering into one end of said air-distributing duct, said return-air duct communicating with said motor and blower chamber and said blower, said air-distributing duct having a progressively decreasing cross-sectional area from the blower end to the other end of the duct.

5. In an open top refrigerated display case wherein is provided a food chamber having a window in its front wall and a semi-ceiling adjacent its back wall, a top opening between said semi-ceiling and said window and a wall extending up from the front edge of said semi-ceiling to a place beyond the top of said window: the improvement which comprises an uptake-air duct at the rear of the food chamber, the approximate upper half of which communicates with the food chamber adjacent said semi-ceiling, shelf standards on the rear wall of said food chamber below the place where said uptake-air duct communicates with said food chamber, a floor for said food chamber, said floor having a slot adjacent said window for return-air passage, means below said floor and communicating with said uptake-air duct and said slot for cooling air and forcing it up said uptake-air duct into the food chamber over food therein and return via said slot.

6. In an open top refrigerated display case wherein is provided a food chamber having a window in its front wall and a semi-ceiling adjacent its back wall and a top opening between said semi-ceiling and said window: the improvement which comprises an uptake-air duct at the rear of the food chamber, the approximate upper half of which communicates with the food chamber adjacent said semi-ceiling, shelf standards on the rear wall of said food chamber below the place where said uptake-air duct communicates with said food chamber, a floor for said food chamber, said floor having a slot adjacent said window for return-air passage, means below said floor and communicating with said uptake-air duct and said slot for cooling air and forcing it up said uptake-air duct into the food chamber over food therein and return via said slot, said floor having a slot along its rear part adjacent said uptake-air duct for passing cool air directly up into the food chamber.

7. In an open top refrigerated display case wherein is provided a food chamber having a window in its front wall the improvement which comprises a semi-ceiling adjacent the back wall of said chamber at a level approximately that of the top of said front wall of said chamber and having a top opening between said semi-ceiling and said window and an upstanding wall at the front of said semi-ceiling, an uptake-air duct at the rear of the food chamber, the approximate upper half of which communicates with the food chamber adjacent said semi-ceiling, shelf standards on the rear wall of said food chamber below the place where said uptake-air duct communicates with said food chamber, a floor for said food chamber at approximately the level of the bottom of said window, said floor having a slot adjacent said window for return-air passage, means below said floor and communicating with said uptake-air duct and said slot for cooling air and forcing it up said uptake-air duct into the food chamber over food therein and return via said slot.

8. In an open top refrigerated display case wherein is provided a food chamber having a window in its front wall the improvement which comprises a semi-ceiling adjacent the back wall of said chamber at a level approximately that of the top of said front wall of said chamber and having a top opening between said semi-ceiling and said window and an upstanding wall at the front of said semi-ceiling, an uptake-air duct at the rear of the food chamber, the approximate upper half of which communicates with the food chamber adjacent said semi-ceiling, shelf standards on the rear wall of said food chamber below the place where said uptake-air duct communicates with said food chamber, a floor for said food chamber, said floor having a slot adjacent said window for return-air passage, means below said floor and communicating with said uptake-air duct and said slot for cooling air and forcing it up said uptake-air duct into the food chamber over food therein and return via said slot, and a foraminous guard over the front slot of said floor and within the food chamber.

9. In an open top refrigerated display case wherein is provided a food chamber having a window in its front wall the improvement which comprises a semi-ceiling adjacent the back wall of said chamber at a level approximately that of the top of said front wall of said chamber and

having a top opening between said semi-ceiling and said window and an upstanding wall at the front of said semi-ceiling, an uptake-air duct at the rear of the food chamber, the approximate upper half of which communicates with the food chamber adjacent said semi-ceiling, shelf standards on the rear wall of said food chamber below the place where said uptake-air duct communicates with said food chamber, a floor for said food chamber at approximately the level of the bottom of said window, said floor having a slot adjacent said window for return-air passage, means below said floor and communicating with said uptake-air duct and said slot for cooling air and forcing it up said uptake-air duct into the food chamber over food therein and return via said slot, and a foraminous guard over the front slot of said floor and within the food chamber.

10. In an open top refrigerated display case where is provided a food chamber having a window in its front wall, an uptake air-duct at the rear of the food chamber having openings for delivering air forwardly over the upper portion of the food chamber, a floor for said food chamber having a return air opening adjacent said window and a longitudinal uptake air opening adjacent said uptake air-duct, and means for causing cooling air to circulate through said openings, said food chamber and said return air opening, and an upwardly curved foraminous guard over said return air opening.

11. A display case of the character described including a substantially open top cabinet, a foraminous display supporting means inset within the open top of the cabinet to provide the bottom of a display compartment accessible through said open top, means which is apertured above the level of said display supporting means and spaced from a wall of the cabinet and extending upwardly toward the top of the display compartment to provide an air duct from which chilled air is adapted to be discharged forwardly across the display compartment toward the opposite wall, means forming a duct below the display supporting means for conducting chilled air to be distributed into the display compartment, duct means at said opposite wall having an upwardly opening inlet, a blower in said cabinet for creating a low pressure area at said inlet for drawing the air downwardly through said duct means and delivering the air under pressure to said air duct, and refrigerating means located in the cabinet in the path of said air, said duct forming means which is below the display supporting means comprising a plate having at least one opening through which the air under pressure can pass upwardly.

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