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REFRIGERATOR INCLUDING AIR CIRCULATOR CONTROL MEANS

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FIG. 1

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The present invention relates to a refrigerator and is more particularly concerned with a refrigerator cabinet comprising a freezer compartment and a food storage compartment which are maintained at different temperatures by a single evaporator in the freezer compartment.

One object of the present invention is to provide in a refrigerator having a freezer compartment, a food storage compartment and a single evaporator in the freezer compartment for cooling both compartments, and improved means for controlling the circulation of air between the two compartments.

Another object of the invention is to provide in a two-temperature, single-evaporator refrigerator, an arrangement of a movable chiller tray and cooperating portions of the inner door by means of which air circulation within the cabinet can be effectively and closely controlled.

Further objects and advantages of the invention will become apparent from the following description and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming part of the specification.

In accordance with the present invention there is provided a refrigerator having a cabinet including a rear wall and an access opening at the front of the cabinet. The door for closing the access opening includes a horizontally extending ledge which projects into the cabinet below a single evaporator disposed in the upper portion of the cabinet. In order to provide two different temperature zones or compartments within the cabinet, there is provided a baffle means, preferably in the form of a chiller tray, slidably supported below the evaporator and overlapping the door ledge for dividing the cabinet into an upper freezer compartment and a lower food storage compartment.

The tray is movable within the cabinet from a position in which the rear edge of the tray forms a restricted air passageway with the rear wall of the cabinet to provide minimum air circulation between the food storage compartment and the freezer compartment and a second, forward position in which the size of the passageway is increased for greater air circulation. In both positions of the tray, the forward edge of the tray overlaps the door ledge to prevent substantial air circulation between the tray and the ledge, or in other words along the door side of the compartment.

For a better understanding of the invention, reference may be had to the accompanying drawing in which the single figure is a partial sectional view of a refrigerator cabinet incorporating an embodiment of the present invention.

Referring to the drawing, there is shown a refrigerator cabinet including the usual spaced liner 1 and shelf 2, the space between the two being filled with suitable heat insulation 3. A door 4 of similar double walled construction closes the access opening to the cabinet. For the purpose of cooling the cabinet and the contents there is provided an evaporator 5 disposed in the upper portion of the cabinet and in the modification shown this evaporator is of a box-like construction having an access opening at the front closed by an inner door 6.

A chiller tray 8 slidably supported below the evaporator 5 by a pair of slideways 9 serves as a baffle means for dividing the cabinet into an upper freezer compartment represented by the box-like evaporator 5 and a lower food storage compartment 10. Arranged within the lower food storage compartment 10 are a plurality of shelves 11 suitably supported within the cabinet and a plurality of door shelves 12 supported on the inner wall 14 of the door in the recess 15 provided in the inner door wall 14.

In accordance with the present invention air circulation between the freezer compartment and the food storage compartment is controlled by an arrangement of the chiller tray 8 with the ledge 16 forming the upper side of the recess 15 in such a manner as to require air circulation to the passageway 17 between the rear wall 18 of the cabinet and the rear edge 19 of the chiller tray and to prevent any substantial air circulation at the front of the cabinet. Specifically, the front portion 21 of the tray is arranged in overlapping relationship with the ledge 16, the ledge 16 being of sufficient depth to obtain this overlapping relationship regardless of the position of the chiller tray 8 within the cabinet.

Under summer operating conditions when the ambient or room temperatures are somewhat above normal, heat leakage from the food storage compartment 10 is high so that a greater air circulation is required between the compartment 10 and the freezer compartment to maintain the proper storage temperatures within the compartment 10. Under those conditions, the chiller tray 8 will normally be positioned in its full line or forward position as indicated in the drawing thereby providing a relatively large passageway 17 at the rear of the chiller tray for air circulation between the two compartments. For winter operation, when the room temperature is in the neighborhood of 70°, the tray 8 is moved to its rearmost position as indicated by the dotted lines in order to obtain minimum air circulation. A stop 24 may be provided on one or both of the slideways 9 to limit the rearward movement of the chiller tray 8 and assure a minimum air circulation between the two compartments under all conditions. Also by this arrangement, the tray can be placed in any intermediate position to provide a close control of air circulation for intermediate ambient temperature conditions.

In all positions of the chiller tray 8, it will be noted that the forward edge or end portion 21 of the tray is in overlapping relationship with the ledge 16 so that air circulation is substantially prevented in this area of the cabinet. Also since the chiller tray 8 extends across the width of the cabinet and is in sliding engagement with the slideways 9 on the opposite side of the cabinet structure, air circulation is substantially prevented along the side wall areas of the cabinet. In other words, air flow is restricted to the passageway 17 at the rear of the cabinet.

From the foregoing description it will be seen that there has been provided by the present invention means for controlling or regulating air circulation within a two-temperature refrigerator by a particular arrangement of what may be termed standard components of a refrigerator cabinet of this type, which components also have other uses or functional advantages. By disposing the ledge 16 forming part of the door shelf recess in cooperative arrangement with the chiller tray 8, air circulation control is obtained without the use of special dampers, baffles or the like previously added to cabinets of this type solely for temperature control purposes.

While the present invention has been described with
reference to a particular embodiment thereon, it will be understood that modifications may be made by those skilled in the art without actually departing from the invention. It is therefore intended in the appended claims to cover all such variations as come within the true spirit and scope of the foregoing disclosure.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a refrigerator having a cabinet including a rear wall, and an access opening at the front of said cabinet, a door for closing said access opening including a horizontally extending ledge projecting into said cabinet, an evaporator in the upper portion of said cabinet above said ledge, a chiller tray slidably supported below said evaporator for dividing said cabinet into an upper freezer compartment and a lower food storage compartment, said tray being movable within said cabinet from a position in which the size of said passageway is increased, the forward edge of said tray overlapping said ledge in all positions of said tray to prevent substantial air circulation between said tray and said ledge, a door for closing said access opening including a door shelf recess formed in part by a horizontally extending ledge projecting into said cabinet, an evaporator in the upper portion of said cabinet above said ledge, a chiller tray slidably supported on said side walls below said evaporator and above said ledge for dividing said cabinet into an upper freezer compartment and a lower food storage compartment, said tray being movable within said cabinet from a position in which the rear edge thereof forms a restricted air passageway with the rear wall of said cabinet and second position in which the size of said passageway is increased, the forward edge of said tray overlapping said ledge in all positions of said tray to prevent substantial air circulation between said tray and said ledge.

2. In a refrigerator having a cabinet including side walls, a rear wall, and an access opening at the front thereof, a door for closing said access opening including a horizontally extending ledge projecting into said cabinet, an evaporator in the upper portion of said cabinet above said ledge, a chiller tray slidably supported on said side walls below said evaporator and above said ledge for dividing said cabinet into an upper freezer compartment and a lower food storage compartment, said tray being movable within said cabinet from a position in which the rear edge thereof forms a restricted air passageway with the rear wall of said cabinet and second position in which the size of said passageway is increased, the forward edge of said tray overlapping said ledge in all positions of said tray to prevent substantial air circulation between said tray and said ledge.

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