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2,745,260

HYDRATOR ON REFRIGERATOR CABINET DOOR

Filed Aug. 12, 1953

2 Sheets-Sheet 1

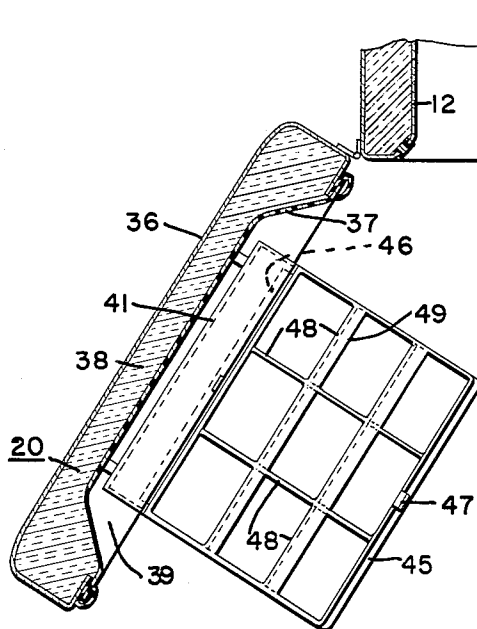


Fig. 4

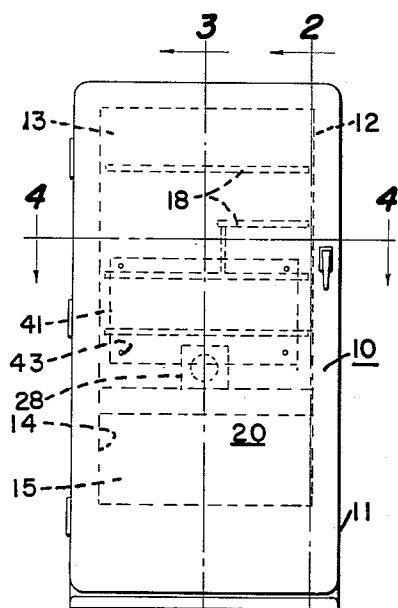


Fig. 1

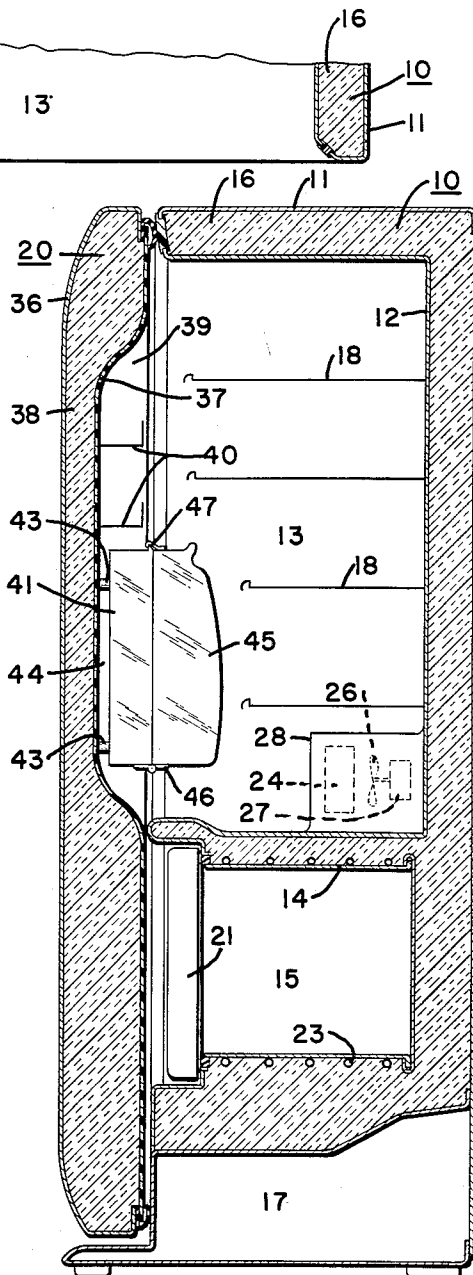


Fig. 2

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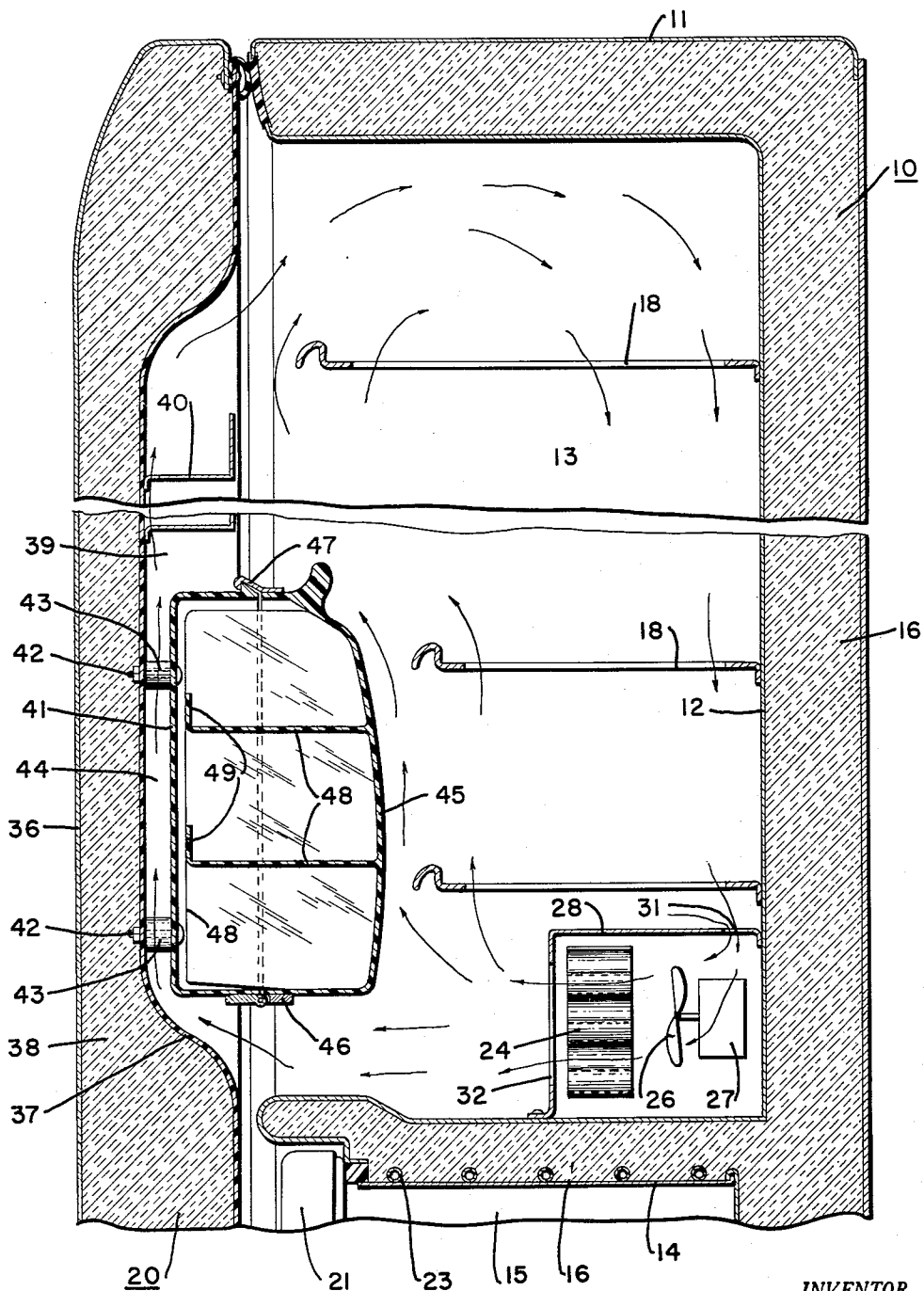
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HYDRATOR ON REFRIGERATOR CABINET DOOR 5

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1 Claim. (Cl. 62—89)

This invention relates to refrigerating apparatus and particularly to an arrangement of a hydrator receptacle in the refrigerated compartment of a refrigerator cabinet.

I am aware of the fact that hydrator receptacles, employed to store vegetables and fruits in a crisp, fresh condition, have been placed in different localities within a refrigerated compartment of a refrigerator cabinet. More recently it has been proposed to mount such a receptacle on a refrigerator cabinet door and particularly in a recessed portion of the inner face of the door so that the receptacle will not materially interfere with or reduce the regular food supporting area of shelves in the food storage compartment of the refrigerator. In providing a recess in a refrigerator cabinet door the recessed portion is usually deprived of some of the insulating material which extends throughout the remaining portions of the door and the heat loss through the door at the recess therein is greater than that at other portions thereof. In order to insure proper or sufficient cooling of the contents of a hydrator receptacle mounted on a door of a refrigerator cabinet, I space the receptacle from the inner face of the door, cool the air in the refrigerated compartment to a predetermined low temperature and provide means for creating a positive circulation of the cooled air in the compartment around the receptacle through the space or passage between the same and the inner face of the door.

An object of my invention is to provide an improved mounting of a hydrator receptacle within a food storage chamber of a refrigerator cabinet.

Another object of my invention is to mount a hydrator receptacle upon and in spaced relation to the inner face of a food storage compartment door of a refrigerator cabinet so as to form a passage therebetween and to provide a forced circulation of cool air around the receptacle through this passage for removing warm air as it forms at the back thereof along the inner face of the door to more effectively chill contents of the receptacle uniformly throughout the interior thereof.

A further object of my invention is to mount a hydrator receptacle upon and in spaced relationship to the inner face of a recessed portion of a food storage compartment door of a refrigerator cabinet and to provide means in addition to an evaporator of a refrigerating system located in and utilized to cool air within the compartment for forcing the cooled air into the door recess over and around the back of the receptacle through the space between the same and the inner face of the recessed portion of the door.

In carrying out the foregoing objects, it is a still further and more specific object of my invention to provide a hydrator receptacle having two members or portions, one of which forms the back wall thereof and is stationarily mounted upon the inner face of a food compartment door of a refrigerated cabinet and extends therealong in spaced relation thereto for the purpose hereinbefore described while the other portion forms a partitioned bin-like cover for the back wall portion and is swingable

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relative thereto when the door is opened to carry or move the contents of the receptacle into an easily accessible position.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 is a front view of a refrigerator having my invention embodied therein;

Fig. 2 is an enlarged vertical sectional view of the refrigerator shown in Fig. 1 and is taken on the line 2—2 thereof;

Fig. 3 is an enlarged broken fragmentary view taken on the line 3—3 of Fig. 1 showing more in detail the mounting of a hydrator receptacle and means for circulating cool air therearound; and

Fig. 4 is a fragmentary horizontal sectional view taken on the line 4—4 of Fig. 1 with the food storage compartment door in open position and showing a cover portion of the hydrator assembly moved into a horizontal position relative to the door.

The present invention is an improvement over that disclosed in the copending application of Nolan A. Didion, Serial No. 259,937, filed December 5, 1951, now Patent No. 2,694,906, granted November 23, 1954, and assigned to the same assignee as this application.

Referring now to the drawings, I show in Fig. 1 thereof a refrigerator cabinet 10 having outer metal shells or panels 11 and an inner metal liner 12 forming walls of an unfrozen food storage chamber 13 (see Fig. 2). Another inner metal liner 14, located below the liner 12, forms walls of a freezing or frozen food storage chamber 15 in cabinet 10. Any suitable or desirable insulating material 16 is disposed between the liners 12 and 14 to heat-insulate the food chamber 13 and 15 respectively. This insulating material 16 is also disposed between the bottom of liner 12 and the top of liner 14 to insulate the chambers 13 and 15 from one another. The outer panel or shell 11 extends downwardly beyond chamber 15 to form walls of a machine compartment 17, in which a refrigerant translating device or condensing unit portion of a closed refrigerating system associated with cabinet 10 is located, as is conventional in the art. A plurality of vertically spaced apart horizontally disposed reticulated sheet metal food supporting shelves 18 are suitably mounted in the unfrozen food chamber 13. An insulated door structure, generally represented by the reference character 20, is pivotally mounted upon the front of cabinet 10 and extends substantially from the top to the bottom thereof to close the food chambers 13 and 15. An inner auxiliary closure member 21 forms a separate seal for the freezing or frozen food storage chamber 15 to prevent the relatively warmer air in chamber 13 from entering the same. The closed refrigerating system associated with cabinet 10 includes a refrigerant compressing and condensing unit (not shown) normally located within machine compartment 17, a first freezing evaporator in the form of a conduit coil 23 wrapped around and secured in intimate thermal contact with the outer surfaces of liner 14 and a second evaporator 24 located within the unfrozen food storage compartment 13. The evaporator 24 may be of any suitable or conventional construction and is preferably fabricated from sheet metal wound into a serpentine coil of any desirable compact shape or configuration. Pipes or conduits connect the evaporators 23 and 24 in series flow relation respectively with the refrigerant compressing and condensing unit and any suitable or conventional control may be employed for controlling operations of this unit.

In order to prevent the formation of any warm air pockets within the unfrozen food storage chamber 13, I employ a fan or blower 26 for circulating air over evaporator 24 and throughout this chamber. Fan or blower 26 is also utilized for a more specific purpose to be hereinafter described. An electric motor 27, controlled in any suitable or desirable manner, drives fan or blower 26. A shroud or the like housing 28 has its walls cooperating with walls of food storage chamber 13 for enclosing both the electric motor 27 and the fan 26. This shroud is provided with an air inlet opening 31 in its top wall and an air discharge opening 32 in the front side thereof.

The door 20 is hinged to cabinet 10 for horizontal swinging movement relative thereto and is preferably provided with a recessed portion in its inner face. Door 20 includes an outer metal pan or panel 36 and an inner panel 37 having insulation, such as the insulating material 38, therebetween. The door pans or panels 36 and 37 are secured together at their edges in any suitable or conventional manner and a gasket is located at the point of attachment of the panels to one another for engaging cabinet 10 to normally seal the open front thereof. Panel 37, which forms the inner face of door 20, is shaped to provide a recess 39 therein. I provide a special receptacle within the chamber 13 commonly referred to as a hydrator, which is vented or provided with a restricted flow of refrigerated air in chamber 13 thereinto and therefrom, for the storage of vegetables and the like to preserve the same in a green, fresh and crisp condition. A part of this special receptacle together with a plurality of shelves 40, secured to door 20 are disposed in the door recess 39. In the present disclosure the hydrator receptacle comprises an assembly secured to door 20 and disposed in spaced relation to the inner face of a part of the recess therein. The hydrator assembly comprises a back wall or pan-like member or portion 41 stationarily secured to and spaced from the inner face of door 20 by a plurality of suitable bolts 42 (see Fig. 3) and collar-like spacers 43 surrounding the bolts 42 to provide a vertically elongated flue or upright passage 44 between door panel 37 and wall member 41. The assembly also comprises a front pan-like cover member or portion 45 hingedly mounted upon back wall member 41 by a piano-like hinge 46 extending along the bottom of members 41 and 45. A latch 47 of any suitable or conventional design is provided at the top of the hydrator assembly for normally locking the hinged cover member or portion 45 to member or portion 41 so that the assembly lies vertically along the inner face of door 20. It is to be noted that the bottom of the hydrator assembly is spaced from and cooperates with the lower wall of chamber 13 to provide a continuation of the flue or a passageway therebetween leading into the recess in door 20. The members 41 and 45 of the assembly cooperate with one another to provide the hydrator receptacle and the loose fit or joint between these members, as disclosed in Figure 3 of the drawings, may serve to vent the interior of the receptacle to the refrigerated unfrozen food storage chamber 13. Hinge 46 permits cover member 45 of the hydrator receptacle to swing down relative to back wall member 41, when door 20 is opened, into a horizontal position at the front of cabinet 10 as shown in Fig. 4. Any suitable means or conventional device may be employed for stopping cover 45 in a horizontal position. For example, hinge 46 may be provided with hinge butt stops or the like arranged to prevent downward swinging movement of cover member 45 beyond 90° from its closed position. At least, cover member 45 of the hydrator assembly may be formed of transparent molded plastic material and this member is provided with a plurality of integral vertical and horizontal walls 48 forming partitioning means dividing the interior of the receptacle into horizontally aligned superimposed separate compartments for the storage of certain types of vegetables or the like in segregated form. Each of the

horizontally extending walls 48 of cover member 45 are provided with an upstanding flange 49. These horizontally extending walls 48 form shelves within the hydrator receptacle for receiving and supporting vegetables and the like therein and the flanges 49 prevent movement of contents of the receptacle off the shelves while cover member 45 is being swung relative to back wall member 41. In other words, swinging movement of cover member 45 carries the contents of the hydrator assembly therewith into an easily accessible position to permit removal of vegetables or the like from the compartments formed by partitions or walls 48.

In the use of the refrigerator herein disclosed, the refrigerating system associated therewith maintains evaporator or coil 23 and consequently the interior of frozen food chamber 15 at a temperature of, say, for example, between -10° and 10° F. Evaporator 24 is maintained below 32° F. so as to provide a desired food preserving temperature in the unfrozen food storage chamber 13. As before stated, electric motor 27 may be operated under the control of any suitable controlling means or it may be connected in series with the motor of the motor-compressor unit of the refrigerating system and operated simultaneously therewith. Operation of motor 27 drives fan or blower 26 and the fan draws air from chamber 13 into the shroud 28, through its inlet opening 31, circulates this air over evaporator 24 and discharges the same from the shroud 28 through the discharge or outlet opening 32. Air cooled by circulation thereof over evaporator 24 re-enters the unfrozen food chamber 13 and this cool air flows forwardly over the front portion of the hydrator receptacle. Some of the cool air is forced, by fan 26, through the continuation of the flue under the hydrator receptacle and forwardly therearound through the passage or flue 44 intermediate the inner face of door 20 and the back wall portion 41 of the hydrator receptacle. The air which is forced through passage or flue 44 flows upwardly beyond the hydrator receptacle through or around the back of the shelves 40 by way of suitable openings provided in these shelves. All of the air flows to the upper front portion of chamber 13, rearwardly therein and thence downwardly at the back of the chamber. The air which is forced forwardly through the passage 44 in back of the hydrator assembly carries away warm air as it forms adjacent the inner face of door 20 at the rear of stationary back wall member 41 of the receptacle. By circulating some of the cool air around the hydrator receptacle before the same becomes completely mixed with other air in chamber 13 and in carrying away warm air as it forms adjacent the inner face of door 20, vegetables or the like, stored in the rear portion of the receptacle, are prevented from being warmed, are maintained at substantially the same temperature as vegetables located in the front portion of the hydrator receptacle and are kept fresh and crisp.

It should be apparent that I have provided an improved hydrator receptacle arrangement within a refrigerator wherein the receptacle is readily accessible when the refrigerator door is opened. By stationarily mounting one pan member or wall portion of the hydrator receptacle on the refrigerator cabinet door and spacing the same from the inner recessed face thereof, my improved arrangement presents several advantages. The hydrator receptacle is opened, for access to vegetable compartments therein, when its front wall or cover member is swung downwardly of its stationary back wall. The spacing of the stationary back wall of the receptacle from the inner face of the cabinet door permits air to be circulated entirely around the receptacle to maintain a substantially uniform temperature throughout the interior thereof.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted.

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What is claimed is as follows:

In a refrigerator, a cabinet having a food storage chamber therein provided with a front opening, a door normally closing said chamber opening, a refrigerating system associated with said cabinet including an evaporator for cooling air in said chamber, a hydrator receptacle carried by said door, said receptacle comprising a back wall stationarily mounted upon said door in spaced relation to the inner face thereof forming a flue therebetween and a cover member pivotally secured to the lower portion of said back wall for vertical swinging movement relative thereto, means for circulating air over said evaporator to cool and cause the cooled air to flow through said flue for carrying away warm air as it forms in the space between said receptacle back wall and the inner face of said door, said cover member of said hydrator receptacle having partitioning means thereon dividing the interior of the receptacle into compartments,

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one of said partitioning means forming a support within said receptacle above the bottom thereof for receiving and supporting food products therein, and said receptacle cover member together with food products therein being swingable downwardly relative to its stationary back wall into a horizontal plane, when said door is opened, to provide access to the food products at substantially a waist high level.

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