Jan. 26, 1954 F. B. ANDERSON 2,667,042

REFRIGERATING SYSTEM, INCLUDING DEFROSTER DRAINAGE RECEPTACLE AND SUPPORT THEREFOR

Filed April 7, 1952

FIG. 1

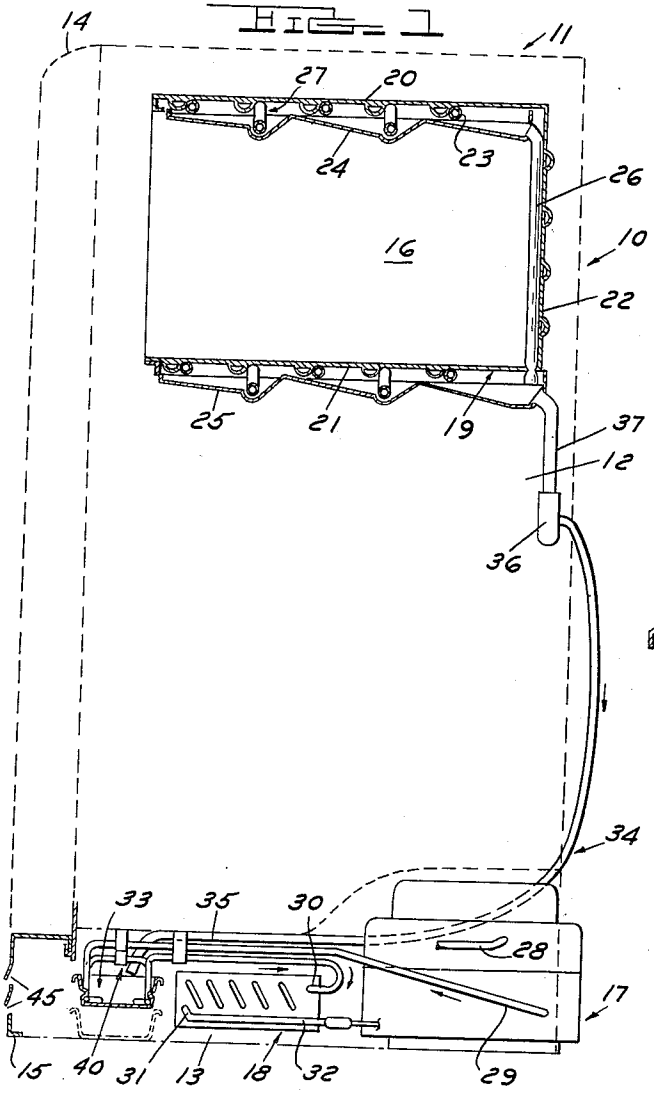


FIG. 3

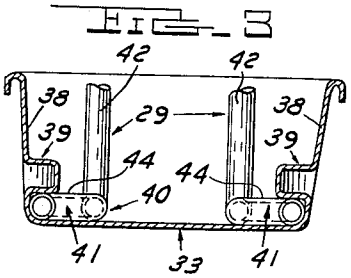
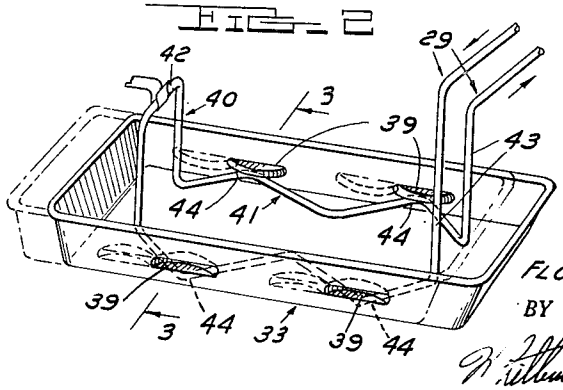


FIG. 2



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REFRIGERATING SYSTEM, INCLUDING DEFROSTER DRAINAGE RECEPTACLE AND SUPPORT THEREFOR

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7 Claims. (Cl. 62—117.8)

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This invention relates generally to refrigerating systems and refers more particularly to improvements in means for vaporizing moisture in refrigerators.

It is an object of this invention to provide a moisture collecting pan or receptacle supported in a readily accessible position by a section of tubing through which refrigerant passes at a temperature sufficiently high to vaporize moisture collected by the pan.

It is another object of this invention to provide the section of the tubing connecting the exhaust side of a refrigerant compressor to the entrant end of a refrigerant condenser with a loop having opposed leg portions disposed within the moisture collecting pan and respectively extending along opposite side walls of the pan to transfer heat from the refrigerant flowing through said tubing to the moisture contained in the pan.

It is still another object of this invention to removably support the pan on the opposed leg portions of the loop section in a manner such that removal of the pan from said section may be effected by merely sliding the pan lengthwise relative to the leg portions of the loop section.

It is a further object of this invention to support the moisture collecting pan in a position wherein it may be readily removed when desired and wherein the vapor resulting from evaporation of the moisture passes freely into the room or space in which the refrigerating system is used.

The foregoing as well as other objects will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawing, wherein:

Figure 1 is a diagrammatic elevational view partly in section of a refrigerator cabinet and showing a refrigerating system embodying the features of this invention;

Figure 2 is a perspective view of a part of the refrigerating system shown in Figure 1 and illustrating the drainage receptacle and support therefor; and

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2.

The refrigerating system forming the subject matter of this invention is shown for the purpose of illustration as installed within a domestic refrigerator, although it will be understood as this description proceeds that the invention may be advantageously used in connection with refrigerating systems in general having a moisture disposal problem. With this in view reference is made more in detail to Figure 1, wherein it will be noted that the numeral 10 designates a conventional domestic refrigerator comprising the usual cabinet 11 having a food storage compartment 12 and a machinery compartment 13 positioned below the bottom wall of the compartment 12. In accordance with conventional practice the food storage compartment 12 has an access opening through the front of the cabinet closed by a door 14, and the front of the machinery compartment 13 is closed by a trim panel 15 removably attached to the cabinet in any suitable manner.

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The interior of the food storage compartment 12 is cooled by a refrigerating apparatus comprising a cooling element or evaporator 16, a motor-compressor unit 17 and a condenser 18. The evaporator 16 may be of any suitable construction, and is diagrammatically shown herein as supported within the food storage compartment 12 adjacent the top wall of the cabinet. Also the evaporator 16 is shown in Figure 1 of the drawing as comprising a casing 19 having top, bottom and rear walls 20, 21 and 22. The front of the casing 19 is open and is normally closed by a suitable door not shown herein. The interior of the evaporator casing 19 as well as the interior of the food storage compartment 12 is cooled by circulating the selected refrigerant through tubing 23 arranged in coils and supported in heat exchange relation to the walls of the casing 19.

Provision is made for collecting moisture draining from the walls of the evaporator casing 19 during periods of defrost; and for accomplishing this result, two receptacles 24 and 25 are provided. The receptacle 24 is suitably supported within the evaporator casing 19 directly below the top wall 20, and the receptacle 25 is supported within the food storage compartment 12 directly below the bottom wall 21 of the evaporator casing 19. The arrangement is such that moisture draining from the top wall 20 collects in the receptacle 24 and moisture draining from both the bottom wall 21 and rear wall 22 collects within the receptacle 25. The two receptacles are connected by a drain conduit 26 suitably supported in the evaporator casing 19 adjacent the rear wall 22 thereof. In some instances it may be desirable to facilitate defrosting of the evaporator 16 and this may be accomplished by an electrical resistance type heating element 27 coiled around the evaporator casing 19 in the manner diagrammatically shown in Figure 1 of the drawing. Also if desired sections of the heating element 27 may be extended into the respective receptacles 24 and 25 to assure maintaining the temperature of the moisture in the receptacles above the freezing point.

The motor-compressor unit 17 and the con-

denser 18 are supported within the machinery compartment 13. Both of these units may be of conventional design and hence need not be described in detail herein. It is sufficient to point out that the intake side of the compressor is connected by a length of tubing 28 to the discharge end of the evaporator tubing 23 and the delivery side of the compressor is connected by a length of tubing 29 to the receiving end 30 of the condenser 18. The delivery end 31 of the condenser 18 is connected to the receiving end of the evaporator coil 23 through the medium of the usual control instrumentalities and the tubing 32.

A moisture collecting container or pan 33 is supported within the machinery compartment 13 at the front side of the condenser 18 in a position to be readily accessible through the open front of the machinery compartment, and communicates with the moisture collecting receptacle through the medium of a suitable conduit 34. The conduit 34 has a flexible section 35 suitably secured to the cabinet with the lower end opening into the top of the pan 33 and with the upper end connected to a trap 36. The trap 36 is in turn connected to the receptacle 25 adjacent the rear wall of the latter by a pipe 37. Thus it will be noted that water deposited in both the receptacles 24 and 25 is drained through the conduit 34 to the pan 33. As shown particularly in Figures 2 and 3 of the drawings, opposite side walls 38 of the pan 33 are embossed or otherwise formed to provide each wall 38 with a pair of projections 39. The pairs of projections 39 extend laterally inwardly from the respective side walls 38 adjacent the bottom of the pan 33, and the projections of each pair are spaced from each other in the direction of length of the pan 33.

In accordance with the present invention the pan 33 is removably supported by the length of tubing 29, and the water or moisture collected by the pan is heated by the refrigerant passing through the length of tubing 29. As shown in Figure 2 of the drawing, the length of tubing 29 has a section intermediate the ends which extends forwardly in the machinery compartment 13 to a position at the front side of the condenser 18, and is bent to form a loop 40. The loop 40 has opposed leg portions 41 disposed in a common horizontal plane, and has a base portion 42 which is bent to extend upwardly from the leg portions 41. Also the extremities of the leg portions 41 are respectively bent upwardly as at 43 and are connected to the tubing 29. The length of the leg portions 41 is less than the length of the pan 43, and these leg portions are disposed into the pan 33 in order to transfer heat from the refrigerant passing therethrough to the moisture or water collected in the pan 33.

As shown particularly in Figure 3 of the drawing, each leg portion 41 of the loop-section 40 is bowed laterally outwardly at longitudinally spaced points to form seats 44. The seats 44 are adapted to assume positions between the projections 39 on the side walls 38 of the pan 33, and the bottom wall of the pan in order to support the latter in the position shown in Figure 1 of the drawing. The spacing between projections 39 on the side walls 38 of the pan 33 and the spacing between the adjacent seating portions 44 on the legs 41 is such that sliding movement of the pan 33 to the broken line position shown in Figure 2 of the drawing releases the projections 39 from the respective seats 44, and enables the pan to be dropped to the broken line

position shown in Figure 1. When the pan 33 is in this latter position, it may be readily withdrawn from the machinery compartment 13 through the access opening at the front of the machinery compartment by merely removing the trim panel 15.

It is apparent from the above that the moisture collecting pan 33 is not only removably supported by the length of tubing connecting the discharge side of the compressor to the entrant end of the condenser 18, but in addition, the moisture or water collected by the pan 33 is heated to an elevated temperature by the refrigerant passing through this tubing. Hence the moisture or water contained in the pan 33 is evaporated, and the vapor passes freely through the access opening at the front of the machinery compartment. If desired the trim panel 15 may be provided with vent openings 45 in order to facilitate passage of the vapor into the room in which the refrigerator cabinet is installed.

What I claim as my invention is:

1. In a refrigerating system, a condenser unit, a compressor unit, a cooling unit, tubing connecting said units and having a section through which refrigerant flows at a temperature sufficiently high to vaporize water, a pan positioned to collect moisture dripping from the cooling unit, said section of the tubing extending into the pan in heat exchange relation to moisture collected by the pan and having portions removably engageable with adjacent portions of the pan to support the pan in the moisture collecting position aforesaid.

2. In a refrigerating system, a condenser unit, a compressor unit, a cooling unit, tubing connecting said units and having a section through which refrigerant flows at a temperature sufficiently high to vaporize water, a pan positioned to collect moisture dripping from the cooling unit and having upright walls, said section of the tubing comprising a looped portion having opposed legs respectively extending along said walls of the pan within the latter in heat exchange relationship to the moisture collected by the pan, and said legs cooperating with the adjacent walls of the pan to removably support said pan in the moisture collecting position aforesaid.

3. In a refrigerating system, a condenser unit, a compressor unit, a cooling unit, tubing connecting said units and having a section through which refrigerant flows at a temperature sufficiently high to vaporize water, a pan positioned to collect moisture dripping from the cooling unit and having upright walls, said section of the tubing comprising a looped portion having opposed legs respectively extending along said walls of the pan within the latter in heat exchange relationship to the moisture collected by the pan, and means projecting laterally inwardly from the walls aforesaid of the pan and removably engageable with adjacent legs of the looped portion to support the pan in the moisture collecting position aforesaid.

4. In a refrigerating system, a condenser unit, a compressor unit, a cooling unit, tubing connecting said units and having a section through which refrigerant flows at a temperature sufficiently high to vaporize water, a pan positioned to collect moisture dripping from the cooling unit and having upright walls, said section of the tubing comprising a looped portion having opposed legs respectively extending along said walls within the pan and having portions of the

legs extended laterally outwardly toward the adjacent walls to form seats, and projections extending laterally inwardly from said walls and overlying said seats to support the pan in the moisture collecting position aforesaid.

5. The structure defined in claim 4 wherein the seats and projections are relatively located and dimensioned to release the pan from the looped portion upon sliding movement of the pan relative to the legs of said looped portion.

6. In a refrigerating system, a condenser unit, a compressor unit, a cooling unit, a length of tubing connecting the discharge side of the compressor to the receiving end of the condenser and having a looped portion intermediate the ends thereof, a moisture collecting pan having projections extending laterally inwardly from opposite side walls thereof, a receptacle supported below the cooling unit in a position to receive moisture dripping from the cooling unit and having a fluid connection with the pan, the opposed legs of the looped portion of said tubing extending into the pan along the opposite side walls of said pan and arranged to provide seats for engaging the projections on the opposite side walls of the pan to support the latter.

7. In a refrigerating system, a condenser unit,

a compressor unit, a cooling unit, tubing connecting said units and having a section through which refrigerant flows at a temperature sufficiently high to vaporize water, a pan positioned to collect moisture dripping from the cooling unit and having upright walls, said section of the tubing comprising a looped portion having opposed legs respectively extending along said walls within the pan and having longitudinally spaced portions of each leg extended laterally outwardly toward the adjacent walls of the pan to form seats, and projections extending laterally inwardly from each of said walls in positions to respectively overlie the seats and releasable from said seats in response to sliding movement of the pan relative to the looped portion of the tubing.

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