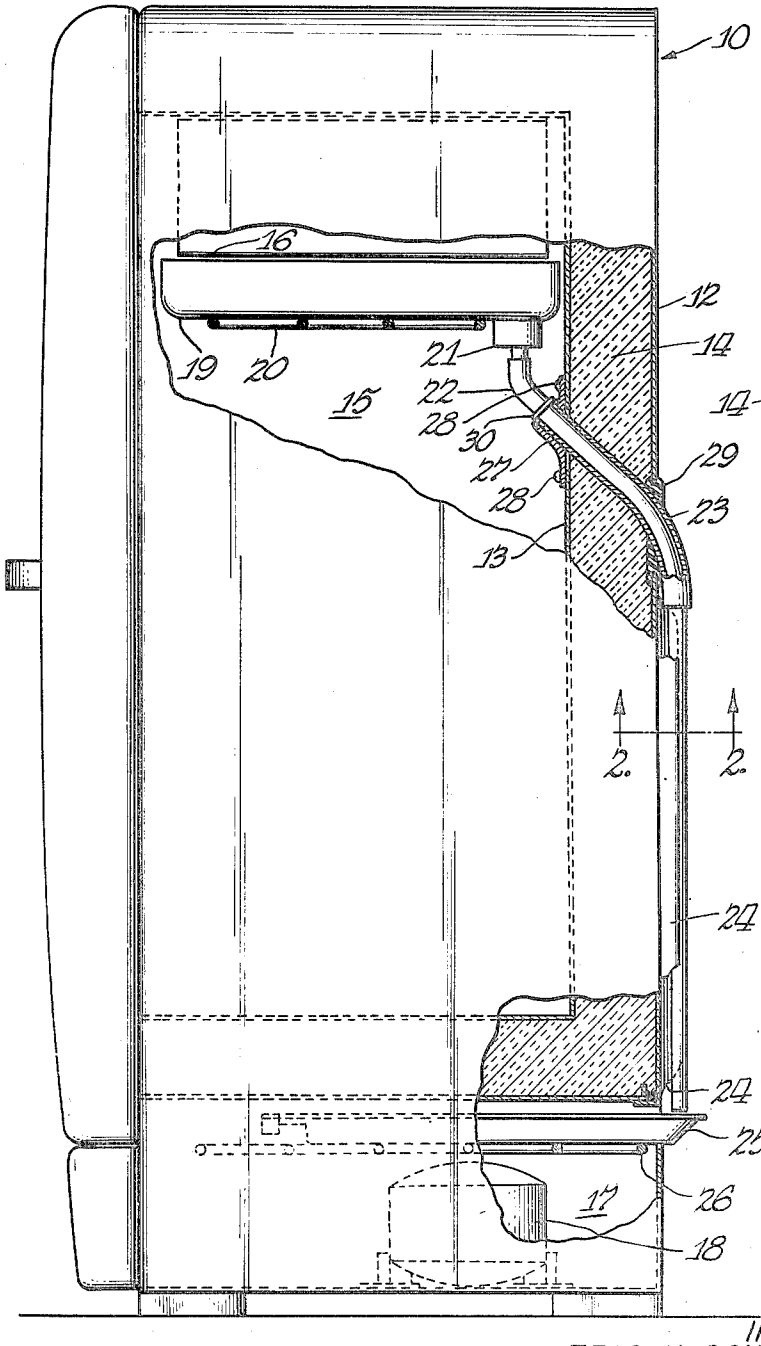
Sept. 7, 1954 E. H. SCHWENKER 2,688,235

DEFROST WATER DISPOSAL SYSTEM

Filed April 7, 1953

FIG. 1



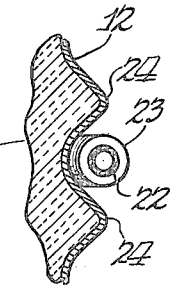


FIG. 2

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DEFROST WATER DISPOSAL SYSTEM

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6 Claims. (Cl. 62—103)

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This invention relates generally to refrigerator defrosting systems and more specifically to an improved defrost water disposal system for use in a refrigerator.

Means are well known in the art whereby the defrost water which drips from the evaporator of a refrigerator is collected into a drip tray, and wherein some tubing means are provided for connecting the tray externally of the refrigerator cabinet, whereby the defrost water which collects in the drip tray is conducted to some disposal means without the refrigerator cabinet. These systems have the disadvantage in that the tubing means for drainage of the drip tray often becomes clogged and requires periodical cleaning, and often it is very difficult to remove the tubing means for cleaning or to clean the tubing means in place.

Therefore it is an object of this invention to provide a defrost water disposal system wherein the tubing means of the system is easily removable for cleaning thereof and is easily replaceable.

It is a feature of this invention that flexible tubing is used with other structures to fulfill the aforementioned object.

Other objects and features of the present invention will be apparent upon a perusal of the following specification and drawings of which:

Figure 1 is a side view of a refrigerator cabinet in partial cross section embodying the present invention; and

Figure 2 is a cross sectional view of a portion of the structure shown in Figure 1 taken along the line 2—2.

The present embodiment is the preferred embodiment but it is to be understood that changes can be made in the present embodiment by one skilled in the art without departing from the spirit and scope of this invention.

For a detailed description of the invention reference is made to the drawing. A refrigerator cabinet 10 is shown with a refrigerator door 11 pivotally mounted over the open side thereof. The refrigerator cabinet 10 comprises an outer liner 12 and an inner liner 13 disposed within the outer liner 12 and positioned a certain distance therefrom. Insulation 14 is disposed between the outer liner 12 and the inner liner 13 to completely fill the spaces therebetween. The inner liner 13 defines a food storage compartment 15. An evaporator 16 is disposed within the food storage compartment 15 in the upper portion thereof. The evaporator 16, as well known in the art, serves to cool the food storage compartment 15 and to provide space internally thereof for maintaining a small amount of food at freezing

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temperatures. The lower portion of the refrigerator cabinet 10 is provided with a machinery compartment 17. As is well known in the art, a motor-compressor unit 18 for the operation of the refrigerator is positioned within the machinery compartment 17, and a condenser (not shown) is also mounted in cooperation with the machinery compartment 17. Further, tubing means (not shown) interconnects the motor-compressor unit 18, the condenser (not shown), and the evaporator 16 for operation of the refrigerator.

After a period of operation of the refrigerator, substantial quantities of frost will accumulate on the surfaces of the evaporator 16, which will interfere with the efficient operation of the refrigerator. Any means well known in the art for defrosting the evaporator 16 may be used to melt the accumulated frost from the surfaces thereof. When this is done the defrost water will drip from the surfaces of the evaporator. To collect this defrost water, a drip tray 19 is provided. The drip tray 19 is positioned below the evaporator 16 and is formed in the shape of a tray slightly larger in area than the evaporator 16 to thereby collect any defrost water dripping from the surfaces of the evaporator 16. The drip tray 19 may be maintained below the evaporator 16 by any means well known in the art such as a rack 20. A drain tube 21 is provided through the lower surface of the drip tray 19 substantially at the rear thereof. The inner lower surface of the drip tray 19 is formed to slope in all directions towards the drain tube 21. Thus it may easily be seen that any defrost water dripping from the surfaces of the evaporator 16 will fall into the drip tray 19, and will flow therein to and through the drain tube 21.

To conduct the defrost water externally of the refrigerator cabinet for easy disposal thereof, a drainage system is provided. This drainage system comprises a length of flexible tubing 22, a length of rigid tubing 23, a pair of ridges 24 and a water pan 25. The water pan 25 is removably positioned within the machinery compartment 17 and a portion thereof projects from the rear of the refrigerator cabinet 10, as can easily be seen in Figure 1. The water pan 25 is removably positioned upon a rack 26 over the motor-compressor unit 18, whereby the water pan 25 will absorb heat from the motor-compressor unit 18 to cause an evaporation of any water disposed within the water pan 25. Also, the water pan 25 may be removed from the rear of the refrigerator cabinet 10 or may be removed from the front of the refrigerator cab-

inet 10 when the refrigerator door 11 is opened. Structure other than the rack 26 may be used to removably maintain the water pan 25 within the machinery compartment 17, for instance, the water pan 25 may be formed to have flanges at the sides thereof and these flanges may be positioned within a pair of channels mounted to the upper wall of the machinery compartment 17.

The length of rigid tubing 23 is curved so that when the length of tubing 23 is mounted through the rear wall of the refrigerator cabinet 10 as shown in Figure 1, one end of the tubing 23 points in a substantially upward direction and the other end of the length of tubing 23 points in a substantially downward direction. The length of tubing 23 is mounted through the inner liner 13, the insulation 14, and the outer liner 12 as shown in Figure 1. A bracket 27 is attached to the upper end of the length of tubing 23, and the bracket 27 is in turn attached to the inner liner 13 by means of a plurality of fasteners 28 projecting through the bracket 27 and the inner liner 13. The lower end of the length of tubing 23 is maintained in proper alignment by a resilient grommet 29. The resilient grommet 29 is mounted in cooperation with a hole through the outer liner 12 and about a portion of the length of tubing 23 near the lower end thereof, as can easily be seen in Figure 1.

Directly below the lower end of the length of tubing 23, a vertical channel is positioned. This channel is disposed between two vertical ridges 24. The vertical ridges 24 are formed in the outer liner 12 of the refrigerator cabinet 10 by any means well known in the art, such as stamping. These ridges 24 are of a length substantially equal to the distance from the top of the machinery compartment 17 to the lower end of the length of tubing 23.

The length of flexible tubing 22 is formed of any material well known in the art which will render it flexible, such as a plastic material. The length of flexible tubing 22 is positioned within the length of rigid tubing 23, and the upper end of the length of tubing 22 is press fitted over the drain tube 21. The remainder of the length of tubing 22 extends in a downward direction between the ridges 24, and the lower end thereof is positioned above the rear end of the water pan 25 as can easily be seen in Figure 1. The length of tubing 22 has a shoulder 30 formed as an integral part thereof. As can be seen in Figure 1, the shoulder 30 of the length of tubing 22 limits the amount of the length of tubing 22 that can be directed downward through the length of rigid tubing 23. Therefore it may be seen that the length of tubing 22 is of such a length that the upper end thereof may be connected to the drain tube 21 and the lower end thereof will be positioned over the water pan 25 when the shoulder 30 is positioned against the upper end of the length of rigid tubing 23.

Thus it can be seen that the length of tubing 22 may be easily removed from the refrigerator cabinet 10 by disconnecting the upper end of the length of tubing 22 from the drain tube 21, and by then withdrawing the length of tubing 22 from the length of tubing 23. Once the length of tubing 22 has been removed from the refrigerator 10 it may be easily cleaned and any obstructions or sediments may be removed therefrom. It can further be seen that the length of tubing 22 may be easily repositioned within the refrigerator cabinet 10 by projecting the lower end of the length of tubing 22 through the length of tubing 23 from the interior of the refrigerator cabinet 10 until the shoulder 30 rests against the upper end of the length of tubing 23. As the lower end of the length of tubing 22 is directed through the length of tubing 23 and emerges from the lower end thereof, the pair of ridges 24 will serve to guide the lower end of the length of tubing 22 in a downward direction, properly positioning the lower end of the length of tubing 22 over the rearward portion of the water pan 25. The upper end of the length of tubing 22 can then be connected to the drain tube 21 to complete the mounting of the length of tubing 22 within the refrigerator cabinet 10.

Having described the invention what is considered new and desired to be protected by Letters Patent is:

1. In a refrigerator having a defrostable evaporator positioned within a food storage compartment thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray positioned within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing mounted to extend through the rear wall of said refrigerator from the interior thereof in a generally sloping downward direction to the exterior thereof, a water pan removably mounted below said food storage compartment and having a portion thereof extending rearwardly of said rear wall of said refrigerator, a length of flexible tubing removably positioned through said length of rigid tubing, one end of said length of flexible tubing connected to said drain tube, the other end of said length of flexible tubing positioned over said portion of said water pan extending rearwardly of said rear wall of said refrigerator.

2. In a refrigerator having a defrostable evaporator positioned within a food storage compartment thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray positioned within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing mounted to extend through the rear wall of said refrigerator from the interior thereof in a generally sloping downward direction to the exterior thereof, a water pan removably mounted below said food storage compartment and having a portion thereof extending rearwardly of said rear wall of said refrigerator, a length of flexible tubing removably positioned through said length of rigid tubing, one end of said length of flexible tubing connected to said drain tube, the other end of said length of flexible tubing positioned over said portion of said water pan extending rearwardly of said rear wall of said refrigerator, a pair of spaced apart longitudinal ridges formed on the outer rear wall of said refrigerator, said ridges being positioned on each side of a vertical line from the center of the lower end of said length of rigid tubing, whereby said ridges serve as vertical guides for the portion of said length of flexible tubing depending from the lower end of said length of rigid tubing.

3. In a refrigerator having a defrostable evaporator positioned within a food storage compartment thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray positioned within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing positioned to extend through the rear wall of said refrigera-

tor from the food storage compartment thereof in a generally downwardly sloping direction to the exterior thereof, a bracket connected to the portion of said length of rigid tubing within said food storage compartment and further connected to the inner rear wall of said refrigerator, a resilient grommet disposed about the lower end of said length of rigid tubing and connected to the outer rear wall of said refrigerator, whereby said length of rigid tubing is secured through the rear wall of said refrigerator, a water pan removably mounted below said food storage compartment and having a portion thereof extending rearwardly of said rear wall of said refrigerator, a pair of spaced apart longitudinal ridges formed on the outer rear wall of said refrigerator, said ridges being positioned on each side of a vertical line from the center of the lower end of said length of rigid tubing, a length of flexible tubing removably positioned through said length of rigid tubing and between said longitudinal ridges, one end of said length of flexible tubing connected to said drain tube, the other end of said length of tubing positioned over said portion of said water pan extending rearwardly of said rear wall of said refrigerator, an annular flange fixedly mounted about said length of flexible tubing, said annular flange positioned against the upper end of said length of rigid tubing, whereby said annular flange limits the amount of said length of flexible tubing which is movable through said length of rigid tubing.

4. In combination, a refrigerator cabinet comprising an outer liner, an inner liner defining a food storage compartment spaced apart from said outer liner, insulation disposed between said liners, a defrostable evaporator positioned within said food storage compartment substantially in the upper portion thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray positioned within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing mounted to extend through said inner liner, said insulation, and said outer liner of the rear wall of said refrigerator cabinet, said length of rigid tubing positioned in a generally downward sloping direction from the inner liner, through said insulation, and through said outer liner, a water pan removably mounted within said refrigerator cabinet below said food storage compartment and having a portion thereof extending rearwardly of said outer liner, a length of flexible tubing removably positioned through said length of rigid tubing, one end of said length of flexible tubing connected to said drain tube, the other end of said length of flexible tubing positioned over said portion of said water pan extending rearwardly of said outer liner.

5. In combination, a refrigerator cabinet comprising an outer liner, an inner liner defining a food storage compartment spaced apart from said outer liner, insulation disposed between said liners, a defrostable evaporator positioned within said food storage compartment substantially in the upper portion thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray position within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing mounted to extend through the inner liner,

said insulation, and the outer liner of the rear wall of said refrigerator cabinet from said inner liner in a generally sloping downward direction through said outer liner, a length of flexible tubing removably positioned through said length of rigid tubing, one end of said length of flexible tubing connected to said drain tube, a water pan removably mounted below said food storage compartment and having a portion thereof extending rearwardly of said rear wall of said refrigerator cabinet, a pair of spaced apart longitudinal ridges formed on the outer liner of said rear wall of said refrigerator cabinet, said ridges being positioned on each side of a vertical line from the center of the lower end of said length of rigid tubing, whereby said ridges serve as vertical guides for the portion of said length of flexible tubing depending from the lower end of said length of rigid tubing.

6. In combination, a refrigerator cabinet comprising an outer liner, an inner liner defining a food storage compartment spaced apart from said outer liner, insulation disposed between said liners, a defrostable evaporator positioned within said food storage compartment substantially in the upper portion thereof, means for disposing of the defrost water dripping from said evaporator, said means comprising a drip tray positioned within said food storage compartment below said evaporator, a drain tube depending from the lower surface of said drip tray, a length of rigid tubing positioned to extend through the inner liner, said insulation, and said outer liner of the rear wall of said refrigerator from the food storage compartment in a generally sloping downward direction through the outer liner, a bracket connected to the portion of said length of rigid tubing within said food storage compartment and further connected to said inner liner, a resilient grommet disposed about the lower end of said length of rigid tubing and connected to said outer liner, whereby said length of rigid tubing is secured through the rear wall of said refrigerator, a water pan removably mounted below said food storage compartment and having a portion thereof extending rearwardly of said rear wall of said refrigerator, a pair of spaced apart longitudinal ridges formed on said outer liner of said rear wall of said refrigerator, said ridges being positioned on each side of a vertical line from the center of the lower end of said length of rigid tubing, a length of flexible tubing removably positioned through said length of rigid tubing and between said longitudinal ridges, one end of said length of flexible tubing connected to said drain tube, the other end of said length of flexible tubing positioned over said portion of said water pan extending rearwardly of said rear wall of said refrigerator, and an annular flange fixedly mounted about said length of flexible tubing, said annular flange positioned against the upper end of said length of rigid tubing, whereby said annular flange limits the amount of said length of flexible tubing which is movable through said length of rigid tubing.

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