March 16, 1954 C. H. WURTZ 2,672,028

PLURAL TEMPERATURE REFRIGERATING APPARATUS

Filed Aug. 27, 1951 2 Sheets-Sheet 1

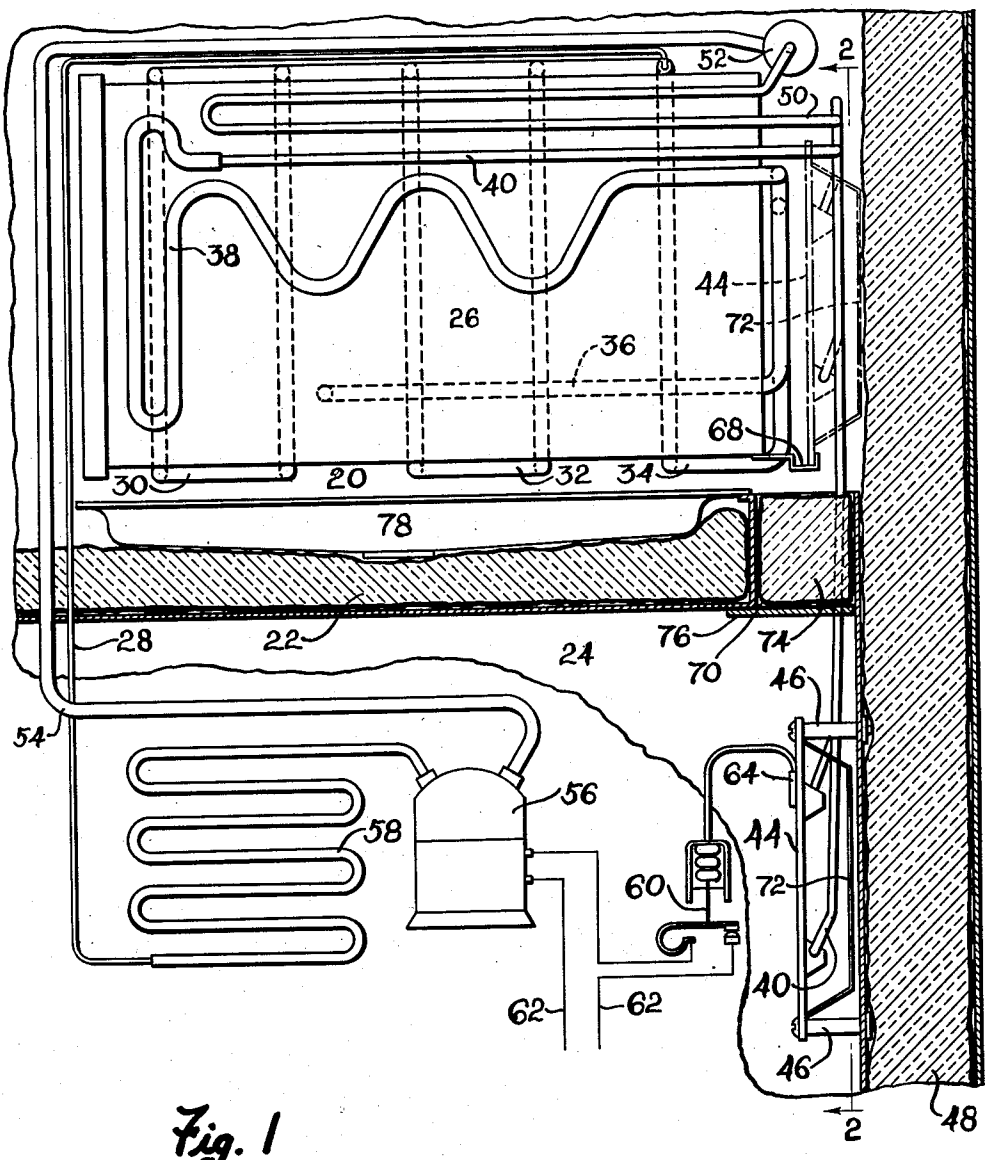


Fig. 1

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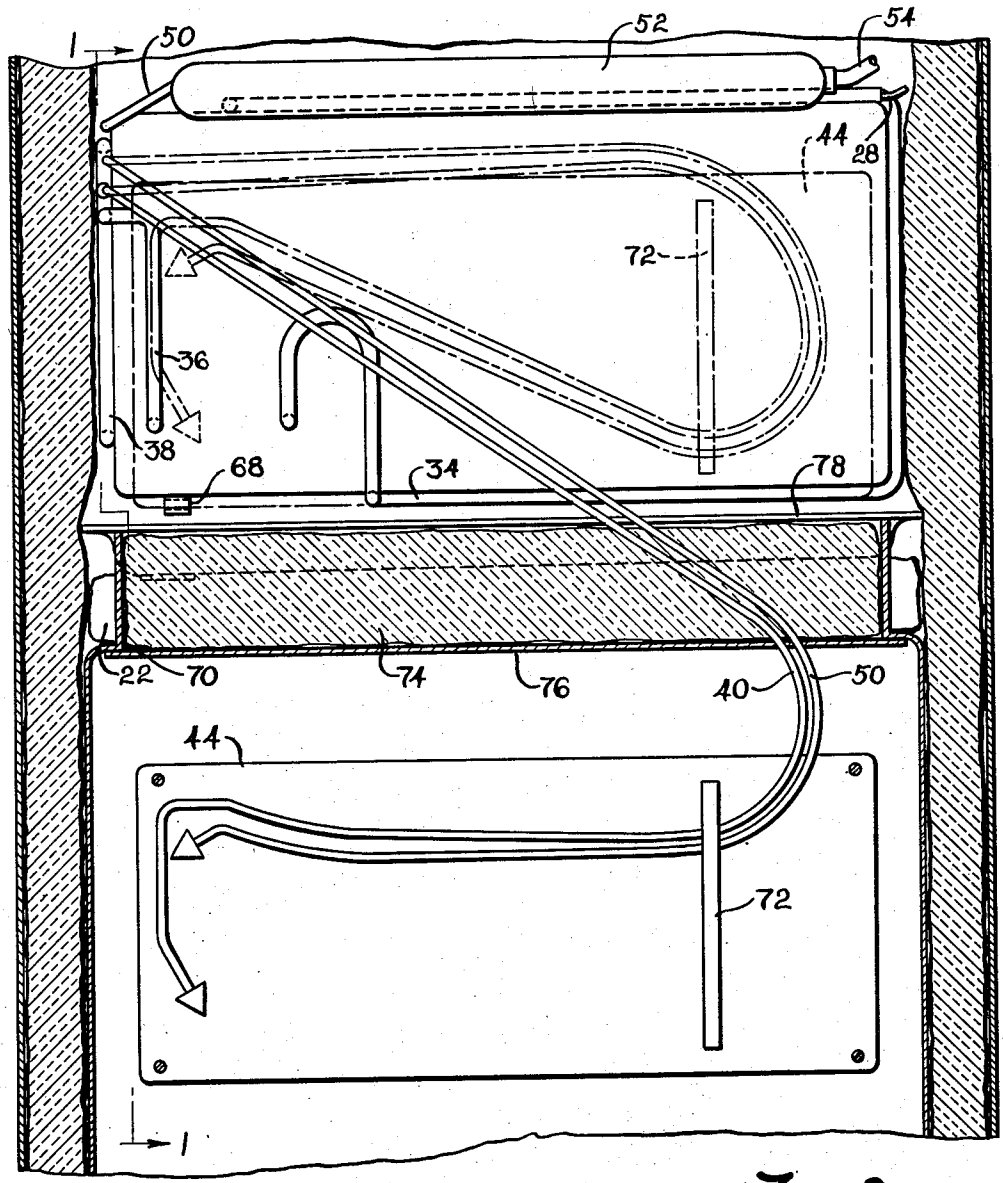


Fig. 2

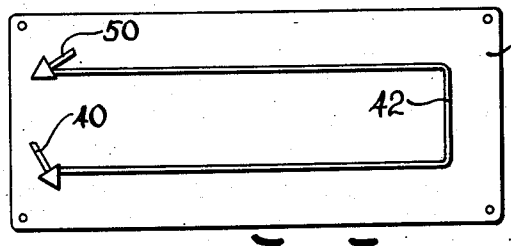


Fig. 3

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PLURAL TEMPERATURE REFRIGERATING APPARATUS

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Application August 27, 1951, Serial No. 243,782

3 Claims. (Cl. 62—117.2)

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This invention relates to refrigerating apparatus and more particularly to two compartment household refrigerators.

Since the requirements for freezing and food storage in household refrigerators are quite different, there has been a trend to provide separate isolated compartments for each and separate evaporators for separately cooling the isolated compartments. For processing and ease in handling it is desirable, prior to installation in the refrigerator cabinet, that the two evaporators be handled and processed as a unit.

It is an object of my invention to provide a simple, economical arrangement wherein two evaporators in a refrigerant system may be removably connected and processed as a unit during processing and be easily installed in a refrigerator cabinet.

It is another object of my invention to provide an arrangement in a household refrigerator wherein the freezing and food compartment evaporators may be assembled into the cabinet as a unit and then easily separated and fastened in their proper locations.

To attain these objects I provide flexible refrigerant conduit connections between the evaporators. I provide a support on the freezing evaporator for removably supporting the food compartment evaporator. There is provided an opening at the rear of the separating partition between the freezing compartment and the food compartment through which the food compartment evaporator is removed from the freezing compartment and moved into the food compartment where it is fastened in a vertical position. The opening at the rear of the partition is then closed by suitable closure means which may include flexible resilient insulating material.

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 form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a fragmentary vertical sectional view taken on the line 1—1 of Fig. 2 disclosing one form of my invention;

Fig. 2 is a fragmentary vertical sectional view taken along the line 2—2 of Fig. 1 disclosing a transverse vertical sectional view of the refrigerator shown in Fig. 1; and

Fig. 3 is a view of the opposite side of the food compartment evaporator from that shown in Fig. 2.

Referring now to the drawings, there is shown

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in the upper portion of the cabinet a freezing compartment 20 separated by an insulated partition wall 22 from a food compartment 24 beneath the wall 22. These compartments preferably are provided within a cabinet having separate outer doors for the freezing compartment 20 and the food compartment 24 in a manner generally illustrated in the Whitehead Patent No. 1,812,070, issued June 30, 1931.

A rectangular box-shaped freezing compartment evaporator 26 is located in the freezing compartment 20. It is fed with liquid refrigerant from the capillary restrictor tube 28 connecting with the loops 30, 32 and 34 of refrigerant tubing which is bonded to the outer surface of the top, side and bottom walls of the outer surface of the box-shaped sheet metal walls of the evaporator 26. The evaporator 26 also includes a loop 36 of refrigerant tubing for cooling the ice tray shelves and the liquid trap portion 38 at the end of this portion of the tubing. From the end of the liquid trap portion 38 there extends flexible connecting tubing 40 of a smaller diameter which connects with the lower portion of the U-shaped refrigerant passage 42 provided in the substantially flat rectangular vertical refrigerated plate 44. This plate plate 44 is fastened by the spacers and screws 46 to the insulated rear wall 48 of the cabinet. The upper portion of the refrigerant passage 42 is connected by the flexible refrigerant conduit 50 which has a loop mounted upon the upper portion of the side wall of the freezing compartment evaporator 26 and finally connects to an accumulator 52 mounted substantially horizontally adjacent the upper rear edge of the freezing compartment evaporator 26.

The upper portion of the accumulator 52 is connected by a suction conduit 54 with the suction inlet of a sealed motor compressor unit 56 which withdraws all of the evaporated refrigerant from the two refrigerant evaporators 26 and 44 through the accumulator 52. This evaporated refrigerant is compressed by the sealed motor compressor unit 56 and forwarded to the condenser 58 where the compressed refrigerant is liquefied and conducted to the capillary restrictor tube 28. Preferably for controlling the system I provide a snap acting switch mechanism 60 having its contacts connected in series with one of the supply conductors 62 which supply the electric energy to the sealed compressor unit 56. This snap acting switch 60 has its actuating bellows connected to a thermostat bulb 64 mounted at a suitable location upon the refrigerated plate

44. The switch 60 is preferably a constant cut-on switch of a wide cycle type having its cut-on point selected at some suitable defrosting temperature such as 34° or 36° F. This insures the defrosting of the plate 44 during each idle period of the motor compressor unit 56.

It would be bulky and difficult and expensive to process and handle the two evaporators separately or when connected by a considerable length of tubing. Therefore, for ease of handling I provide at the lower rear edge of the evaporator 26, two hook-shaped supports 68 for removably supporting the refrigerated plate 44 without disturbing the connecting refrigerant conduits 40 and 50. These connected refrigerant conduits 50 and 40 are sufficiently small to bend readily and permit the location of the refrigerated plate 44 upon the supports 68 as shown in dot-dash lines in both Figs. 1 and 2. These connections are arranged in a loop of adequate length to permit easy movement of the refrigerated plate 44 to and from each location.

When the refrigerating system is installed in the cabinet, the refrigerated plate 44 is mounted upon the support 68 as shown in the dot-dash lines in Figs. 1 and 2. There is a long narrow opening 70 provided in the refrigerated cabinet between the freezing compartment 20 and the food compartment 24 at or in the rear of the partition wall 22 directly beneath the dot-dash line position of the refrigerated plate 44. To remove the refrigerated plate 44 from its position on the supports 68 at the rear of the freezing compartment 26 there is applied through the opening 70, a forked tool which may be used to lift the refrigerated plate 44 off its supports 68 and permit the plate to be withdrawn from the freezing compartment 20 through the opening 70 and fastened into place in a vertical position in the food compartment 24 as shown in full lines in Fig. 1. The rear face of the refrigerated plate 44 is provided with a loop 72 of a strip metal for holding the loop of the connecting refrigerant conduits 40 and 50 in place during the movement of the refrigerated plate 44 from one position to another.

After the refrigerated plate 44 has been removed to its bottom position in the food compartment, a sealed bag of insulating material 74 is placed in the opening 70 and the opening 70 is closed by a suitable cover plate 76. This completes the closure of the freezing compartment 20 and prevents air from flowing from the food compartment 24 into the freezing compartment 20.

It is ordinarily necessary to defrost the evaporator 26 several times a year. Should there be any frost on the evaporator 26 at such time, the water resulting from the melting of such frost may be collected in the drip pan 78 provided beneath the freezing compartment evaporator 26.

In accordance with the provisions of rule 78*a* reference is made to the following prior filed application: S. N. 223,550 filed April 28, 1951.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. A refrigerator cabinet including insulated walls enclosing a freezing compartment and a food compartment, said walls including a partition wall between the freezing and the food compartments, a freezing evaporating unit located in the freezing compartment, a food compartment evaporating unit having flexible refrigerant conduit connections with the freezing evaporating unit, said freezing evaporating unit having supporting means for supporting said food compartment evaporating unit thereon in close proximity, said partition wall being provided with an opening between the freezing and food compartments adjacent the rear wall of said cabinet and sufficiently large to permit the movement of the food compartment evaporating unit through it, and supporting means for supporting the food compartment evaporating means in the food compartment, said freezing evaporator unit comprising a can shaped food storage element having its bottom wall arranged to conceal said opening.

2. A refrigerator cabinet including insulated walls enclosing a freezing compartment and a food compartment, a partition wall separating the freezing and food compartments, a box shaped freezing evaporating unit in the freezing compartment, a generally flat evaporating unit having flexible connections with the freezing evaporating unit, said freezing evaporating unit having support means for removably supporting said generally flat evaporating unit adjacent its rear wall, said partition wall being provided with an opening adjacent the rear of the partition wall between the freezing and food compartments sufficiently large to permit the movement of the entire flat evaporating unit downwardly through it, and means for supporting said generally flat evaporating unit in the food compartment, the bottom wall of said box shaped freezing unit being arranged to conceal said opening.

3. A refrigerator cabinet including insulated walls enclosing a freezing compartment and a food compartment, a partition wall separating the freezing and food compartments, a box shaped freezing evaporating unit in the freezing compartment, a generally flat evaporating unit having flexible connections with the freezing evaporating unit, said freezing evaporating unit having support means for removably supporting said generally flat evaporating unit adjacent its rear wall, said partition wall being provided with an opening adjacent the rear of the partition wall between the freezing and food compartments sufficiently large to permit the movement of the entire generally flat evaporating unit downwardly through it, and means for supporting said generally flat evaporating unit in the food compartment, in vertical position beneath said opening.

CLIFFORD H. WURTZ.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,789,913	Swezey	Jan. 20, 1931
2,000,787	Phillip	May 7, 1935
2,166,506	Phillip	July 18, 1939
2,291,559	Phillip	July 28, 1942
2,450,844	Stuart	Oct. 5, 1948