April 10, 1945. R. E. TOBEY 2,373,618

REFRIGERATION APPARATUS

Filed Nov. 30, 1943

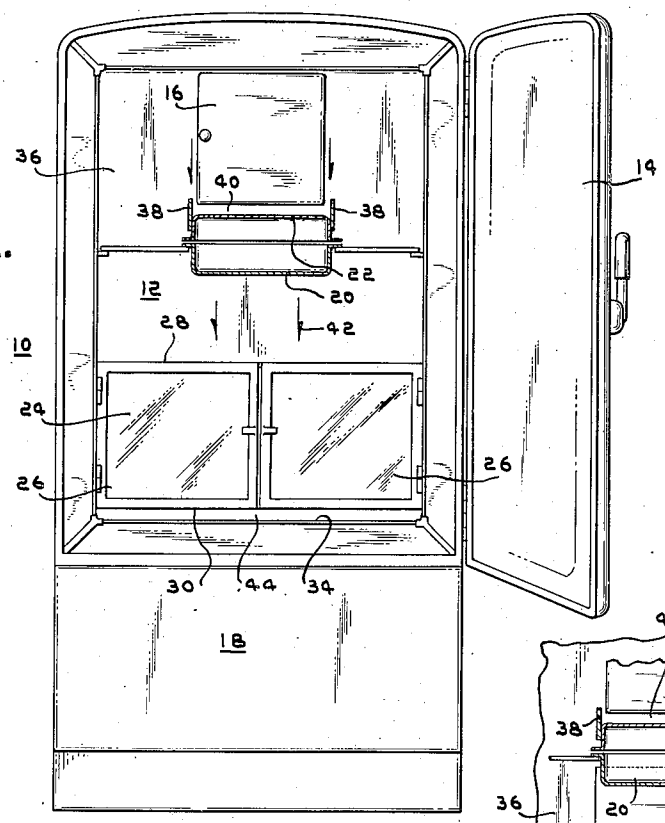


FIG. 1.

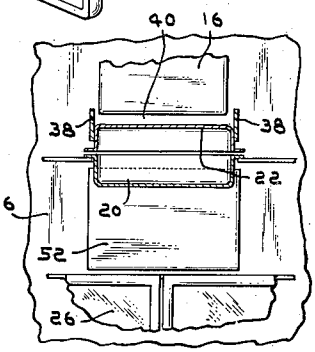


FIG. 3.

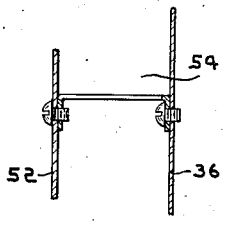


FIG. 5.

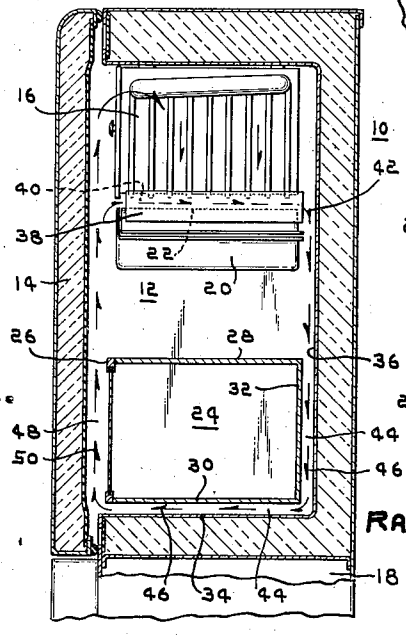


FIG. 2.

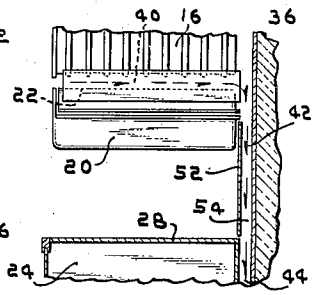


FIG. 4.

WITNESSES:

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REFRIGERATION APPARATUS

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6 Claims. (Cl. 62—89)

My invention relates to refrigeration apparatus and, more particularly, to a refrigerator of the type which includes a high humidity compartment for storing food stuffs that deteriorate upon dehydration. One example of this type apparatus is disclosed in Ashbaugh Patent No. 2,233,394 of March 4, 1941.

One object of my invention is to produce an improved refrigerator of the type set forth.

A further object of my invention is to maintain a lower temperature within the high humidity compartment, better to preserve the more perishable articles of food.

A still further object of my invention is to attain the foregoing objects without the use of increased refrigerating capacity, without the use of expensive or complicated devices and without materially altering the construction of the refrigerator, its refrigerating mechanism, or the structure of the high humidity compartment itself.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawing, forming a part of this application, in which:

Fig. 1 is a front elevational view of a refrigerator embodying my invention;

Fig. 2 is a vertical sectional view of the refrigerator shown in Fig. 1;

Fig. 3 is a fragmentary front elevational view showing a modified form of construction;

Fig. 4 is a fragmentary vertical sectional view of the modified construction shown in Fig. 3; and

Fig. 5 is a fragmentary view showing details of construction.

Referring to the drawing and more particularly to Figs. 1 and 2, there is shown a refrigerator 10 provided with a food-storage compartment 12 having an access opening adapted to be closed by a door 14. In the food-storage compartment 12 there is provided the usual evaporator 16 which is connected through usual conduits (not shown) with conventional refrigerating machinery, housed in a machinery compartment 18 for compressing and condensing the refrigerant. Below the evaporator 16 is a slidably mounted meat container 20 which may be constructed and mounted in position in any well-known manner. The meat container 20 is provided with a cover 22 which is preferably mounted for sliding movement independently of the container 20.

In the lower portion of the food-storage compartment 12 is a high humidity compartment 24 having a front access opening adapted to be closed by a door or doors 26. The high humidity compartment 24 includes a top wall 28, a bottom wall 30 and a rear wall 32 which extend across the entire width of the food compartment 12 so that the side walls of the compartment 12 constitute the side walls of the high humidity compartment 24. The high humidity compartment 24 is supported in spaced relation to the bottom 34, back wall 36 and door 14 of the food-storage compartment 12 by any suitable means (not shown).

In the construction shown, the interior of the high humidity compartment 24 is refrigerated by the cold air in the food-storage compartment 12 coming in contact with the exterior of the compartment 24. Therefore, articles of food stored within the compartment 24 do not come into contact with the relatively dry cold air in the food-storage compartment 12 and hence such articles of food retain a large measure of their original moisture content.

In order more effectively to cool the interior of the high humidity compartment 24, I have devised a simple and inexpensive means for accelerating and improving the convection or circulation of cooled air in the food-storage compartment 12 and around the high humidity compartment 24. According to my invention I provide the cover 22 of the meat container 20 with side flanges 38 which extend upwardly to the level of the bottom of the evaporator 16 or higher if desired. The flanges 38 with the top wall of the cover 22 thus form a channel or open-ended trough 40 disposed below and extending from the front to the back of the evaporator 16.

The trough 40 serves to receive and direct the air flowing downwardly along the exterior of the evaporator 16. Since the rear portion of the evaporator is farther removed from the door 14 and is, therefore, subjected to less heat leakage, it is somewhat colder than the front portion of the evaporator. Therefore, the direction of the flow of cold air in the trough 40 will be rearwardly and downwardly as illustrated by the arrows 42.

Operation

As the air is cooled by the evaporator 16, it moves in the direction of the arrows 42, and flows downwardly along the back wall 36 of the food-storage compartment 12 into the space 44 behind and below the high humidity compartment 24. The flow of air behind and below the compartment 24 is shown by the arrows 46. In flowing past the back and bottom of the compartment 24, the air absorbs some heat and, therefore, becomes

lighter than the air flowing downwardly from the rear end of the trough 40. The relatively warmer and lighter air now rises in a substantially definite current in the space 48 as indicated by the arrows 50, until it comes in contact with the evaporator 16 where it is again cooled.

It will thus be seen that by merely providing the cover 22 with the side flanges 38 which can be very simply and inexpensively produced, I cause very cold air to flow directly and at an accelerated rate in contact with the rear, bottom and front of the compartment 24, in addition to the cold air which normally flows downwardly onto the top 28 of the compartment 24.

In Figs. 3 to 5 I show a modified form of construction in which in addition to the side flanges 38, I use a partition 52 which extends from a point near and behind the upper portion of the container 20 down to a point near the top of the back wall of the high humidity compartment 24 as clearly shown in Fig. 4. The width of the partition 52 may be varied but in the preferred form illustrated in Fig. 1, the width of the partition 52 is substantially equal to the width of the evaporator 16. As will be clearly seen from Fig. 4, a channel 54 is produced between the partition 52 and the adjacent portion of the back wall 36 of the food-storage compartment 12. The cold air flowing out of the rear end of the trough 40, or at least a major portion thereof, now flows in an accelerated stream behind, below and along the front of the high humidity compartment 24 in the manner hereinabove fully explained.

It will be seen from the foregoing that either form of the invention illustrated may readily and inexpensively be incorporated in the structure of refrigerators now in use or to be manufactured in the future, and that the application of my invention in either of the forms illustrated adds very little to the cost or weight of the refrigerator and does not in any way interfere with the structure or disposition of the various conventional parts of a refrigerator such as that shown.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A refrigerator having a food-storage compartment, an evaporator in the upper portion of said compartment, a high humidity compartment positioned in the lower portion of said food-storage compartment in spaced relation to the back, bottom and front walls thereof, whereby an air circulating passage is formed extending along the back, bottom and front of said high humidity compartment, and a trough disposed below, and extending from the front to the rear of, said evaporator, said trough including a bottom wall and upwardly extending side walls, whereby air, cooled by contact with said evaporator, flows downwardly into said trough, and from the rear end of said trough, along the back wall of said food compartment into said circulating passage.

2. The structure recited in claim 1 in which the side walls of said trough extend upwardly substantially to the level of the bottom of said evaporator.

3. The structure recited in claim 1 together with a receptacle disposed below, and in spaced relation to said evaporator, and in which said trough is disposed between said receptacle and said evaporator and serves as a cover for said receptacle.

4. The structure recited in claim 1 in which said high humidity compartment includes a top wall, a bottom wall and a back wall extending the entire width of said food-storage compartment whereby portions of the side walls of said food-storage compartment constitute side walls for said high humidity compartment.

5. A refrigerator having a food-storage compartment, an evaporator in the upper portion of said compartment, a high humidity compartment positioned in the lower portion of said food-storage compartment in spaced relation to the back, bottom and front walls thereof, whereby an air circulating passage is formed extending along the back, bottom and front of said high humidity compartment, a trough positioned below and extending from the front to the rear of said evaporator, said trough including a bottom wall and upwardly extending side walls whereby, air cooled by contact with said evaporator, flows downwardly into said trough, and a partition extending from a point near the rear end of said trough to a point near the top rear edge of said high humidity compartment whereby a channel is formed between said partition and the juxtaposed portion of the back wall of said food-storage compartment for directing a portion of the cold air flowing into said trough directly to the upper end of said air circulating passage.

6. The structure recited in claim 5 in which said partition is of a lesser width than said food-storage compartment.

RAYMOND E. TOBEY.