Oct. 28, 1947. G. E. CURTISS, JR 2,429,709

SHELF FOR REFRIGERATOR CABINETS

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FIG. 1.

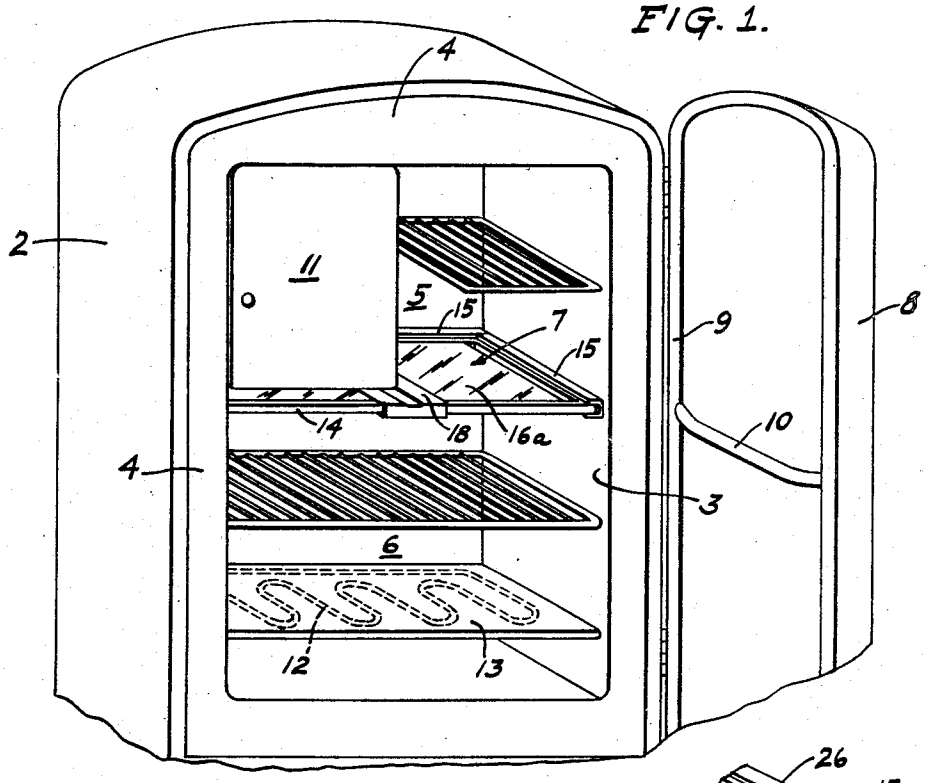


FIG. 2.

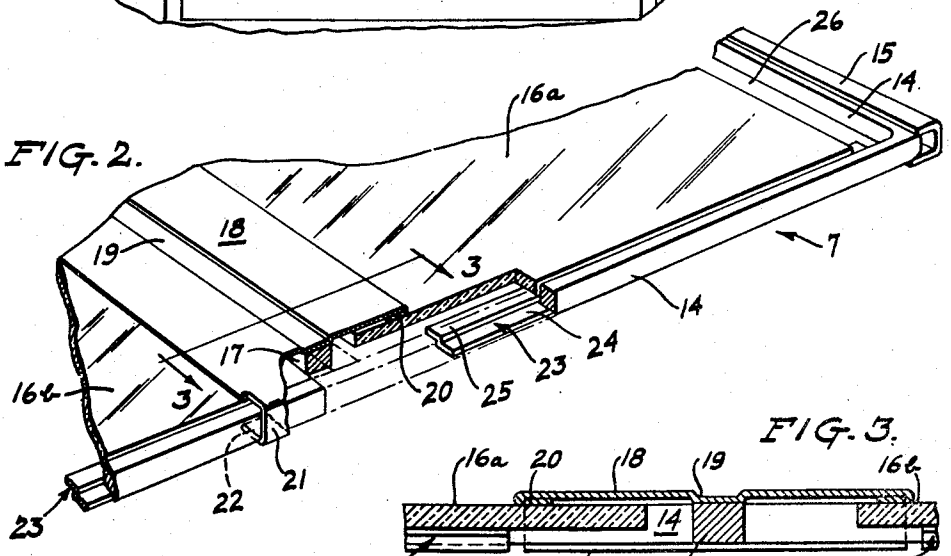


FIG. 3.

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SHELF FOR REFRIGERATOR CABINETS

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3 Claims. (Cl. 62—89)

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This invention relates to refrigerator construction and, more particularly, is concerned with shelving adapted for use with domestic refrigerators.

Still more particularly, the present invention has to do with new and useful improvements in shelf or partition structure for domestic refrigerators of the type provided with two food storage compartments, adapted to be cooled and respectively maintained at different conditions of temperature and humidity.

With relation to the invention, it should be borne in mind that it has proven desirable, in domestic refrigerators, to provide not only a freezing compartment, but also a so-called, moist-cold compartment maintained at a relative humidity value sufficiently high to properly preserve foodstuffs, such as fresh fruits, vegetables, or the like, without dehydration. Such zones or compartments, may conveniently be provided by dividing the space defined by the inner liner into upper and lower food storage compartments, by means of a horizontal partition or shelf. One of these two compartments is usually refrigerated by an evaporator which is maintained at a temperature well below 32° F., for lower temperature freezing and storage purposes, while the other compartment is maintained at a temperature above 32° F., (for example in the neighborhood of 38° to 40° F.) to provide the afore-mentioned high humidity zone.

The partition or shelf which subdivides the cabinet interior into said upper and lower compartments, has commonly been substantially imperforate, so as to prevent the circulation of air between the two compartments and consequent interference with the temperature and humidity conditions respectively maintained in each compartment. However, in such two-compartment refrigerators, it has proven difficult to insure the desired degree of humidity within the moist-cold space throughout the various seasons of the year, while still preventing the humidity from reaching undesirably high values at certain times. As is well known, excessive humidity may result in undesirable condensation of moisture upon the walls of the compartment and in deterioration of the foodstuffs stored therein, and it is desirable in order to prevent such excessive humidity, to provide for some controlled, limited air circulation between the two zones. On the other hand, when the moisture content of the warmer compartment does not tend to become excessive, the two compartments should be isolated from one another.

Accordingly, and with the foregoing in mind,

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the primary object of the present invention is to provide, in a refrigerator of the type set forth, a partition or shelf member which, while normally serving to isolate the two zones, is of a nature to provide for communication and circulation therebetween, as and when desired.

A further object of the present invention resides in the provision of such a partition structure in which any desired degree of communication may be maintained without interfering with the usefulness of the partition as an article-supporting shelf structure.

The invention also has in mind the accomplishment of the afore-mentioned general ends, by the provision of a partition structure which may be readily adjusted, is not space-consuming, is inexpensive and of unusually good appearance.

These and other objects of the invention, together with features and details of the construction thereof, are hereinafter fully described and shown in the accompanying drawings, in which:

Figure 1 is a view in perspective of a refrigerator embodying the present invention;

Figure 2 is an enlarged fragmentary view in perspective, illustrating the partition disassociated from the refrigerator, certain portions being shown in section to facilitate illustration; and

Figure 3 is a sectional view, on an enlarged scale, taken along the line 3—3 of Figure 2.

Referring now more particularly to the drawings, the embodiment illustrated includes a domestic refrigerator having an outer shell 2 and an inner shell or liner member 3, spaced inwardly and insulated from the outer shell 2, by means of insulation (not shown) and the usual thermal breaker strip 4. It will be understood that the refrigerator also includes a compartment housing a condensing unit of any desired type, but illustration of these portions of the apparatus has been omitted since the present invention is not concerned therewith.

As clearly appears in Figure 1, the space within the inner liner 3 is subdivided into an upper food storage compartment 5 and a lower food storage compartment 6, by means of the horizontally disposed, substantially imperforate partition member 7, constructed in accordance with the present invention. As mentioned above this partition also serves as a shelf, as will be readily apparent from the drawing. The front access opening to the refrigerator is provided with a hinged door 8 carrying about its inner peripheral surface the usual resilient gasket 9, adapted to seal the compartment by seating against the cabinet in the plane of the breaker strip structure 4. The door

is further provided with a horizontal gasket portion 10 disposed at the level of the horizontal partition 7 and adapted, when the door is closed, to engage and seal against the forward edge of said partition, to thus prevent the passage of air between the compartments 5 and 6, past said forward edge. Further construction and arrangement of the door and its gaskets may be conventional in nature.

Insofar as the present invention is concerned, either the upper zone 5 or the lower space 6 may be utilized as the colder temperature compartment, and there is illustrated an arrangement in which the upper compartment 5 constitutes said colder zone, while the lower space 6 corresponds to that compartment which is to be maintained at relatively high temperature and humidity. Further, it will be appreciated that any convenient form of refrigerator circuits may be employed, and that the invention is not concerned with the nature of the specific system utilized. However, for the purposes of illustration, the upper, cooler compartment is shown as refrigerated by a main low temperature evaporator 11 which, in this case, is located within the storage space. The moist-cold compartment, on the other hand, is illustrated as being cooled by the evaporator portion 12 of a suitable secondary refrigerating system, said evaporator portion being shown as secured in convoluted arrangement upon the lower surface of a shelf 13. The evaporator 12 may be convoluted about the lower portion of the inner liner, if such be desired.

The secondary evaporator 12 forms a portion of a closed refrigerant circuit, of which a condenser portion (not shown) is arranged in heat exchange relation with the primary evaporator 11, in accordance with well-known practice. As mentioned hereinabove, the secondary evaporator 12 is maintained at a temperature somewhat above 32° F., in order to effectively prevent the frosting-out of the moisture desired in the moist-cold space.

It will be observed that the partition 7 comprises a relatively heavy peripheral frame member 14 extending completely about the partition structure, as best appears in Figure 1, and defining a closed area. Provision is made to support the partition within the refrigerator and, although this may be accomplished in a number of convenient ways, in the embodiment illustrated a channel member 15 having a generally C-shaped cross-sectional configuration is secured to the side and rear walls of the inner liner 3. As clearly appears in Figure 2, the partition main frame member is slidingly received within the channel 15 and may be readily removed, for example, when cleaning is required.

In particular accordance with the present invention, the partition 7 further includes two imperforate sheets 16*a* and 16*b* which are preferably of glass and are mounted in a manner providing for positional adjustment thereof with respect to the side portions of the main frame 14, adjacent the walls of the inner liner, as will now be described.

Making particular reference to Figures 2 and 3, it will be seen that the partition is divided, in the generally central portion thereof, by means of a frame member 17 extending from the front to the rear portion of the partition or shelf and being secured to the forward and rear parallel rods of the main frame 14, as by welding. Only the juncture of the frame 17 and the forward edge of the frame 14, is illustrated in Figures 2 and 3, since the structure along the rear edge of the partition is the same as that of the forward portion. Although a part of the forward edge of rod 14 has been broken away to facilitate illustration, it will be understood, and reference to Figure 3 will illustrate, that the frame 14 extends completely across the forward partition edge. The central section of the adjustable partition further includes a relatively wide cover member 18, preferably formed of a thin sheet of metal, the central portion of which cover is fixed to the central frame rod 17, in the region defined by the depressed area 19. The opposite lateral edges of this cover are provided with rolled flanges 20, to improve the appearance of the partition and to provide a reinforced plane surface bearing against the upper side of the subjacent glass sheets 16*a* and 16*b*. This construction has been found to provide the necessary seal, preventing leakage of air as between the upper and lower compartments, as well as preventing entrance of dirt and moisture beneath the cover member 18.

At its forward and rear edges, the finish cover member 18 is provided with a downwardly turned flange portion 21, the forward one of which appears in the drawings. This flange has a rearwardly projecting ledge 22, which, as appears in Figure 3, preferably extends the full width of the down-turned flange 21 and either bears tightly against or is secured to the under-surface of the adjacent portion of frame member 14, in order to promote the strength and rigidity of the shelf structure.

A pair of offset flange members supports each of the sheets 16*a* and 16*b*, the forward one of which, with respect to glass sheet 16*a*, is shown at 23 in Figure 2. The surface 24 of said flange is secured in any desired manner to the underside of the main frame 14, while its surface 25 provides the actual support for the forward edge of sheet 16*a*, said surface 25 being raised sufficiently, with respect to the flange portion 24, to insure proper alignment between the upper surface of the frame member 14 and the sheet 16*a* which, as shown, is preferably of thinner material than that material of which the frame 14 is formed. Although only the forward flange members 23 are illustrated, it should be understood that similar provision is made to support the rear edges of the sheets 16*a* and 16*b*.

As illustrated, the sheet 16*a* has been adjusted inwardly with respect to the cover member 18, thereby exposing a considerable gap (shown at 26) between the righthand edge portion of the glass sheet and the right lateral extension of the frame member 14 adjacent the liner. This position of the sheet 16*a* corresponds to the adjustment of said sheet when communication is desired between the relatively cold and the moist-cold compartments, that is, when the humidity in the lower compartment tends to approach an excessively high value. An interchange of moisture will occur between the two compartments when the sheet is so positioned, and moisture will become frozen-out upon the cold surfaces presented within the compartment 5. When the humidity within the moist-cold compartment no longer closely approaches a desirable upper limit, the sheet 16*a* may be repositioned to lessen or eliminate the gap 26, the particular adjustment depending upon the condition desired within the compartment 6. Sheet 16*b* may be similarly adjusted along the opposite partition edge; how-

ever, detailed illustration and description need not be repeated herein.

The extension of the cover member to either side of the central frame rod 17 is such as to permit considerable variation in the gap 26, without permitting the inner edge of the glass plate to be withdrawn from beneath said cover member 18. This feature is illustrated in Figure 3, in which figure it will be observed that the inner edge of the sheet 16*a* more closely approaches the center frame rod 17, than does the sheet 16*b*. Although such a differential adjustment of the sheets 16*a* and 16*b* may be desirable under certain conditions, a gap may also be left between the outside edges of both sheets and the adjacent portions of frame 14.

It will be noted that the partition is so constructed that adjustment movements of the glass sheets result in creating or regulating gaps which are spaced apart a substantial distance. Such an arrangement is of importance, in that advantage may be taken of the normal circulatory airflow existing within the refrigerator, with the result that the required degree of moisture equalization will occur more rapidly.

From the foregoing description, it will be seen that the invention provides an attractive partition construction which is susceptible of a relatively wide range of adjustments to meet particular operating conditions and, further, which is of such a nature as to be effective as a shelf surface, in any selected position of adjustment. Further, the elimination of special dampers or shutters effects a considerable reduction in cost, and substantially reduces assembly problems.

I claim:

1. In a partition for refrigerators and the like, a pair of imperforate sheets arranged in side-by-side substantially co-planar relation and being horizontally slidable to define an imperforate shelf surface of adjustable width, the inner adjacent edges of said sheets being spaced—when the shelf is so adjusted as to have its maximum width—to accommodate inward movement of said sheets and consequent reduction of the width of the imperforate shelf, and means preventing the passage of air through the space between said inner edges in any position of shelf adjustment.

2. A partition for refrigerators and the like comprising framing, a pair of imperforate sheets carried by said framing in side-by-side substantially co-planar relation and being horizontally slidable to define an imperforate shelf surface of adjustable width, the inner adjacent edges of said sheets being spaced—when the width of the imperforate shelf surface is a maximum—to accommodate inward movements of said sheets and consequent reduction of the width of the imperforate shelf surface, and a cover member concealing and closely overlying said inner adjacent edges to prevent the passage of air through the space between said inner edges, said cover member extending across said inner edges and over said sheets a distance sufficient to prevent exposure of said edges during desired adjustment movements of said sheets.

3. A partition for refrigerators and the like, comprising a rectangular peripheral frame, a pair of rectangular imperforate sheets carried by said frame in side-by-side substantially co-planar relation, adjacent edges of said sheets being spaced and the sheets being slidable toward and away from one another to present gaps through the partition in the region of side portions thereof, and cover means concealing and closely overlying said spaced adjacent edges to prevent the passage of air therebetween, said cover means extending across said edges and over said sheets a distance sufficient to prevent exposure of said edges during desired adjustment movements of said sheets, said means further spanning and being secured to said frame, whereby to increase the rigidity of the partition.

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