Oct. 31, 1933 W. C. HOLBROOK 1,932,822

REFRIGERATING APPARATUS

Filed March 23, 1929

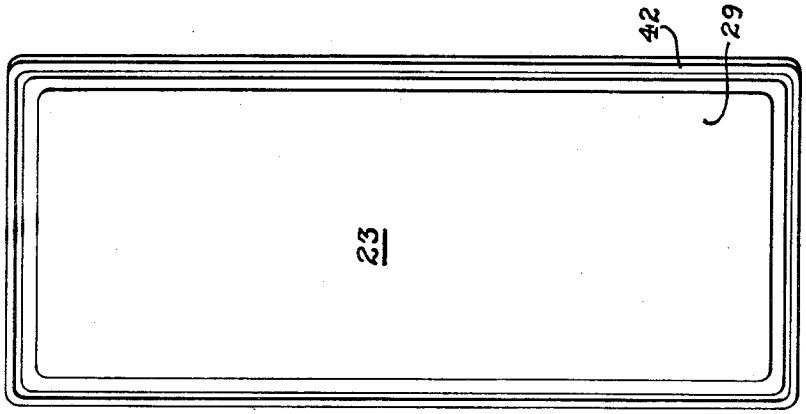

Fig. 1

Fig. 5

Fig. 6

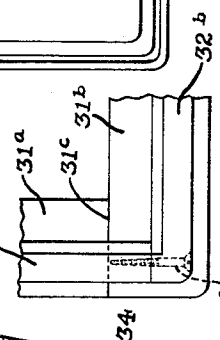

Fig. 4

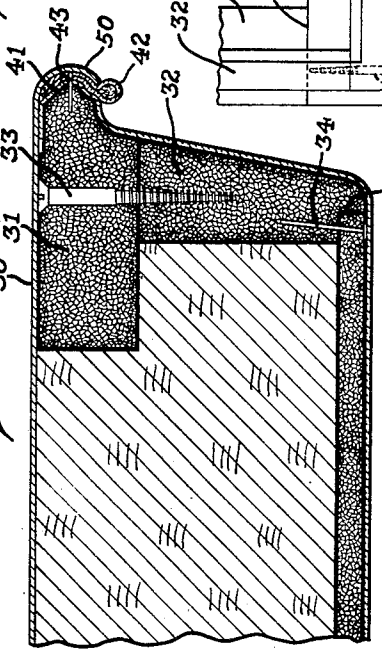

Fig. 7

Fig. 3

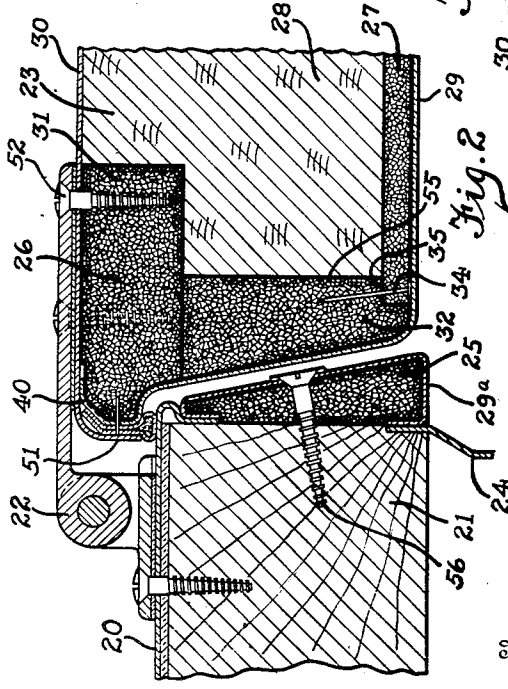

Fig. 2

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UNITED STATES PATENT OFFICE

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REFRIGERATING APPARATUS

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2 Claims. (Cl. 20—35)

This invention relates to refrigerating apparatus and more particularly to the construction of a refrigerator cabinet.

An object of this invention is to reduce the thermal conductivity of a cabinet around the door or access opening of the cabinet.

Another object of this invention is to provide a construction at such opening which has a neat appearance and a reduced thermal conduction capacity.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of the present invention is clearly shown.

In the drawing:

Fig. 1 is an elevation of the inside of a door embodying features of this invention;

Fig. 2 is a cross-sectional view, for instance horizontal, of the hinged side of the door construction;

Fig. 3 is a cross-sectional view of the opposite edge of the door from that shown in Fig. 2;

Fig. 4 is a detail of an embodiment of this invention;

Fig. 5 is a detail cross-sectional view of the edge of a slightly modified door, the view corresponding to a portion of Fig. 2;

Fig. 6 is a cross-sectional view of another edge of the door shown in Fig. 5. the view corresponding to Fig. 3; and

Fig. 7 is a view of a seal which may be used in the construction shown in Figs. 5 and 6.

A refrigerator cabinet embodying features of this invention may be, if desired, a mechanically refrigerated cabinet of the type disclosed in the application of Henry P. Braeutigam and William C. Holbrook, Serial No. 257,989, filed February 28, 1928. The construction around the door or access opening may be slightly modified in order to produce a construction of minimum heat conductivity. In order to produce this minimum of heat conductivity, the metal parts of the opening cover or door and the access or door opening moulding are reduced considerably. As shown in Fig. 2, the front metal panel of the cabinet is indicated as 20. The main door jamb may be constructed of some relatively non-conducting material such as wood and one portion thereof is indicated as 21. Members corresponding to members 20 and 21 extend completely around the door opening. On one side of the door opening, one or more hinges 22 may be attached to the cabinet body proper and also to the door, herein designated as 23. The inside of the cabinet may be provided with a lining 24, preferably of porcelained sheet metal, which forms the food compartment of the refrigerator cabinet. A moulding 25 may be placed inside of the door jamb 21 in order to present a neat appearance at the door opening.

The opening cover, such as door 23, may embody features of this invention. Thus a cover or door frame, generally designated as 26, may be formed and extend substantially around all of the edges of the cover or door. The cover or door frame may also include a flat board 27 adapted to support the insulation and also to lend strength to the cover or door liner 29 hereinafter to be more fully described. The outside of the cover or door may be provided with a metal panel generally designated as 30 which is also supported by the framework 26.

The framework 26 may be made of any suitable strong, non-conducting material such as wood or, in the preferred embodiment, a porous rubber-like material. If the frame is made of the porous rubber-like material, the frame may be made as one integral piece or it may be made from a plurality of members. Thus an integral piece of rubber including the equivalents of members 31, 32 and 27 may be formed. However, it is preferred at present to form a rectangular outer frame member having a cross-section indicated as 31 when the cover is to be a door. An inner rectangular member may also be formed having a cross-section substantially as indicated at 32. A third frame member may be a substantially rectangular board-like member 27. Members 31 and 32 may be secured together by any suitable means as by screws 33 or by suitable cementing material. Member 27 may be secured to member 32 by any suitable means such as by nails or screws 34 or by cementing material. The insulation 28 may be any suitable material such as corkboard or rock wool. It may be inserted as one entire piece or in several pieces as desired during the construction of the cover or door.

As shown in Fig. 4, the framework may be made of still a greater number of parts. Thus the part corresponding to part 31 may be made of two vertical members 31*a* joined to two horizontal members 31*b*. A dovetailed joint 31*c* may be formed, for instance, by making both the members 31*a* and 31*b* of half thickness and overlapping the same at the corner below the line 31*c* in the well-known manner. The member corresponding to member 32 may be formed by providing two vertical members 32*a* and two horizontal members

32b joined at the corner by any suitable means such as by a screw 32c. Members 31a, 31b, may be joined to members 32a and 32b in the same manner as shown in Figs. 2 and 3. This construction is particularly effective when the frame is made of wood or the like. In all of the modifications a groove 35 may be provided to receive the board-like member 27.

The heat conductivity may be maintained at a minimum by placing a special liner or lining member 29 on the cover or door member. Preferably this lining member 29 may be a substantially self-sustaining sheet or sheets of organic material. More specifically, it may be formed of cellulose derivatives such as any suitable nitro-cellulose product, and preferably one of the pyroxylin compounds. A preferred method of placing this lining member on the cover or door is to soften the member 29 by any suitable method or means and to then apply it to the cover or door frame and to curl it around member 31 as indicated at 40 and at 41. After the member 29 has been applied to the frame, a suitable seal 42 having a beaded portion may be suitably attached to the edge of the cover or door by any fastening means, such as staples 43, and then the metal panel 30 may be applied to the cover or door. Preferably the edge away from the hinges, when the cover is a door, is made as shown in Fig. 3, and the other three edges of the door and metal panel are shaped as shown in Fig. 2. That is, the metal panel 30 is provided with one edge having a circular or inwardly bent flange 50 and is provided with three substantially straight flanges 51. The panel 30 may thus be applied first to the edge shown in Fig. 3 and then the panel may be swung about that edge as a pivot and may be placed over the remainder door frame. The panel 30 may then be secured by any suitable means, such as by the screws 52 which also secure the hinge or hinges 22 to the door.

The lining member 29 may be softened by any suitable method or methods. One method is to place the material in a softening solution such as one consisting of one part acetone and three parts of water. After the member 29 has remained in the solution sufficiently long to become sufficiently pliable it may be applied to the door frame, preferably first by applying a coat of cement to the side of the lining member 29 adacent the frame. The lining member 29 is then properly curled around the cover or door. If necessary, the corners of member 29 may be cut in order to provide a proper fit of the lining member to the frame, and the edges thus formed may be cemented together by any suitable cement adapted to adhere to this material and after the cement has dried the edge may be finished by any method such as by sand-papering and buffing.

The material forming the lining member 29 may be softened by any method other than by dipping in solution. Thus any type of vapor which may soften the material may be used for the necessary length of time. Thus methyl acetone may be suspended in any suitable solvent and the lining material and the acetone with the solvent may be placed in a compartment maintained at a temperature sufficient to create the necessary vapor in the compartment to soften the material.

In the construction of the cover or door, it is to be understood that no cements or other material should be used at temperatures which may create a fire hazard due to the inflammability of the lining member 29.

The material which is preferred to be used for the frame is that type of rubber compound which is slightly porous and which is provided with an outer, hard, smooth surface 55 which prevents entrance of moisture into the structure of the rubber, and which presents a suitable surface for the application of the lining material.

The access or door opening may be provided with a moulding 25 which may be made in accordance with the method disclosed for the cover or door. Thus the moulding may include one or more members made of the same kind of rubber material and covered with material 29a of the same character as the material of lining member 29 of the door. This moulding may be secured to the access or door opening jamb by any suitable means such as by screws 56.

It is to be noted that the seal 42 prevents contact of the lining member 29 with any portion of the access or door opening. Thus damage to the member 29 is prevented.

It is to be understood that features of this invention include shapes other than a rectangular door. Thus circular, oblong or other shaped insulated lids may be made in accordance with this invention. The frame, instead of being rectangular, may be made circular in the well-known manner.

When it is desired to provide a seal adapted to be placed on the cover or door without the use of a large number of staples or tacks, a construction as shown in Figs. 5 to 7 inclusive, may be used. Thus a seal may be provided with a contact head 70 and an attaching bead 71. Preferably this is accomplished by bending a tape 72 of waterproofed cloth in the shape of an 8, encasing in the tape two cords to form the head 70 and bead 71 and stitching the edges of the tape at 73. The curved flange 50 is adapted to pinch the bead 71 as shown in Fig. 6, and the shape of the frame and the straight flange 51 are such as to pinch the bead 71 as shown in Fig. 5. Thus the seal may be attached to the door with only a temporary type of fastening staple or with no staples at all.

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, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A door for a refrigerator cabinet comprising an insulated body portion, a layer of sheet material having a materially lower heat conductivity than metal and moulded to form a lining for the inner surface of said body portion, a metal outer covering for said body portion, said covering overlapping said inner lining, and a gasket carried between said lining and said cover and supported by said lining and said cover.

2. A door for a refrigerator comprising a rubber frame, insulating material carried by said frame, a layer of sheet material having a materially lower heat conductivity than metal and moulded to form a lining for the inner surface of said frame, a metal outer covering for said door, said metal covering overlapping said layer of sheet material.

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