July 16, 1935. W. C. HOLBROOK 2,008,325

REFRIGERATING APPARATUS

Original Filed Nov. 30, 1929

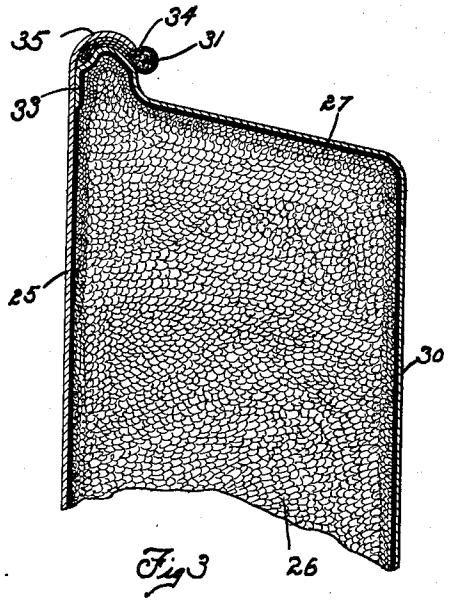


Fig 3

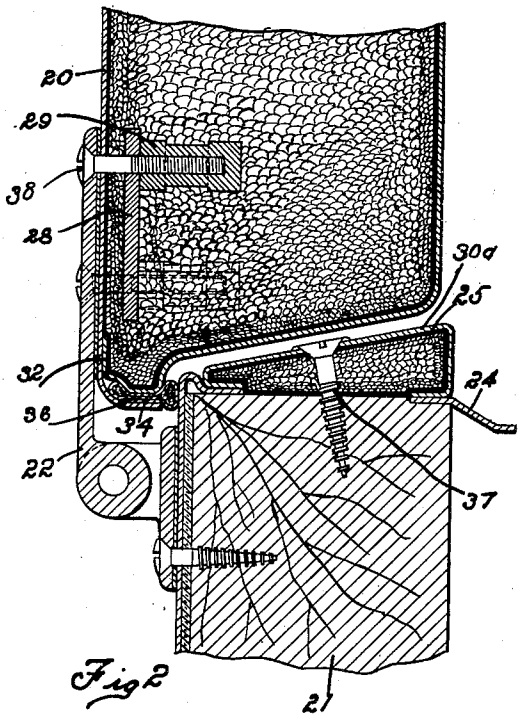


Fig 2

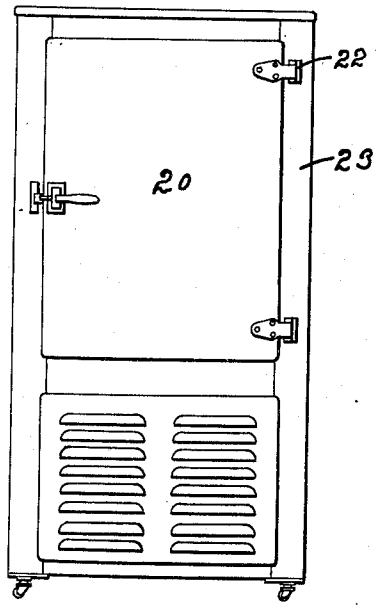


Fig 1

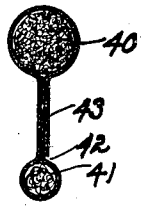


Fig 4

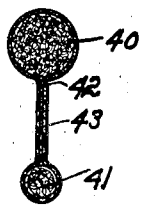


Fig 5

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REFRIGERATING APPARATUS

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Application November 30, 1929, Serial No. 410,762
Renewed June 7, 1934

4 Claims. (Cl. 20—35)

This invention relates to refrigerating apparatus and especially to the construction for the closure elements in the 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 the invention is to provide a closure member for a refrigerator cabinet that shall be lighter in construction, made of better insulation, that does not absorb moisture, and which is very easily assembled.

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 invention is clearly shown.

In the drawing:

Fig. 1 is a front view of a cabinet to which the invention may be applied.

Fig. 2 is a cross sectional view 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 view of a seal which may be used around the edge of the door as disclosed in Figs. 2 and 3.

Fig. 5 is a modification of Fig. 4.

The refrigerator cabinet embodying features of this invention may be if desired a mechanical refrigerator cabinet of the type disclosed in the application of Henry P. Braeutigam and Wm. C. Holbrook S. N. 257,989 filed Feb. 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 molding are reduced considerably. As disclosed 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. The inside of the cabinet may be provided with a lining **24** preferably of porcelained sheet metal which forms the food compartment of the refrigerato. cabinet **23**. A molding **25** may be placed inside of the door jamb **21** in order to present a neat appearance at the door opening.

The interior structure of the door is preferably a molded piece of hard blown rubber **26**. This piece of rubber may be formed in several ways, a preferred form of which is to utilize a gas to expand the interior structure of the rubber into the cellular structure disclosed in the drawing. The rubber is then hardened and a smooth hard shell or crust **27** formed on its exterior. All odors and excess gas have of course been removed from the rubber. This piece of rubber is molded in the specific shape desired for the door. This hard blown rubber is of better insulation than that generally used for the doors of a refrigerator cabinet and furthermore is much lighter and does not absorb moisture.

A metal member **28** and screw retaining members **29** are preferably molded in with the rubber to provide suitable fastening means for the screws **38** of the hinges.

The inner casing member **30** of the door may be of any suitable material but it is preferred to have this casing member **30** of 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 specific pyroxylin compound which has been found to be satisfactory is one known in the trade as "Pyralin". A preferred method of placing this casing member on the cover or door is to soften the member **30** by any suitable method or means and to then apply it to the cover or door frame and to curl it around the projecting beads as indicated at **32** and at **33**.

After the casing member **30** has been applied to the insulation a suitable seal **34** having a beaded portion may be placed at the edges **32, 33** and then the metal panel **20** may be applied to the cover or door. Preferably the edge away from the hinges 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 **20** is provided with one edge having a circular or inwardly bent flange **35** and is provided with three substantially straight flanges **36** on the other edges. The panel or casing member **20** may thus be applied first to the edge as shown in Fig. 3 and then the outer casing panel may be swung about that as a pivot and may be placed over the remainder of the frame. The outer casing member **20** may then be secured by any suitable means such as by the screws **38** which also secure the hinge or hinges **22** to the door.

The lining member **30** may be softened by any suitable method or methods. One method is to place the material in the softening solution such

as one consisting of one part acetone and three parts of water. After the member **30** has remained in the solution sufficiently long to become sufficiently appliable it may be applied to the door frame preferably first by applying a coat of cement to the side of the lining member **30** adjacent the frame. The lining member **30** is then curled around the cover or door. If necessary the corners of member **30** 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 **30** 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 **27**.

The access or door opening may be provided with a molding **25** which may be made in accordance with the method disclosed for the cover or door. Thus the molding may include one or more members made of the same kind of rubber material and covered with material **30***a* of the same character with the material of lining member **30** of the door. This molding may be secured to the access or door opening jamb by any suitable means such as by the screws **37**.

It is to be noted that the seal **34** prevents contact of the lining member **30** with any portion of the access or door opening. Thus damage to the member **30** 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 such as shown in Figs. 2, 3 and 4 or 5 may be used. Thus a seal may be provided with a contact head **40** preferably of cotton and an attaching bead **41** preferably of twisted paper. Preferably this seal is formed by starting a waterproof tape **42** preferably of rubber adjacent one of the large ends and extending it to the opposite end, bending it around the enlarged opposite end, returning to the first end, and bending it around this first, enlarged end, and returning it again to the opposite end. This construction provides a waterproof covering for both ends **40** and **41** and also provides a three ply connecting portion between the two ends. This three ply portion makes the seal very strong. This three ply portion is of course stitched together adjacent each of the adjacent enlarged ends. The grooved flange **35** is adapted to pinch the bead **41** as shown in Fig. 3 and the shape of the insulation and the straight flange **36** are such as to pinch the bead **41** as shown in Fig. 2. Thus the seal may be attached to the door with only a temporary type of fastening staple or with no staple at all.

It will be noted that the structure disclosed is formed of better insulation than that generally used and is also lighter in construction and furthermore does not absorb moisture. As the insulation is molded in one piece and has preferably only an inner casing member and outer casing member with a seal pinched between them the door construction is very simply and easily assembled due to its very few parts. Furthermore it is noted that due to the thickness of the Pyralin inner casing member **30** that there will be very small heat leakages therethru to cause sweating on the surface members of the cabinet as has hitherto been the experience where thicker metal members were used in place of the Pyralin inner casing member.

If preferred, the Pyralin **30** may be preformed into the shape of the door and applied to the blown rubber, also previously formed, by a flexible diaphragm such as is more particularly described in the copending application of Carl Clifford Ritter for Refrigerating apparatus, Docket F-2249 executed November 22, 1929, S. N. 410,854, filed November 30, 1929.

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 closure member for refrigerator cabinets comprising a blown rubber insulation, a metallic casing member for one portion of said insulation and a pyroxylin compound casing member for another portion of said insulation.

2. A door for refrigerator cabinets comprising a blown rubber insulation having a hard crust, said insulation being formed into the shape of a refrigerator door and casing members formed of thin sheets fitting over said formed insulation to provide an outer surface for the door.

3. A refrigerator cabinet wall structure comprising a blown rubber insulation having a hard crust, said insulation being formed into the shape of the wall structure desired and casing members formed of thin sheets fitting over said formed insulation to provide an outer surface for the wall structure.

4. An insulating structure comprising a blown rubber insulation having a hard crust, and a finishing sheet overlying and being bonded to the surface of the hard crust of the blown rubber insulation.

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