Nov. 10, 1942. E. E. VOIGHT 2,301,467

REFRIGERATOR

Filed April 8, 1937 2 Sheets-Sheet 1

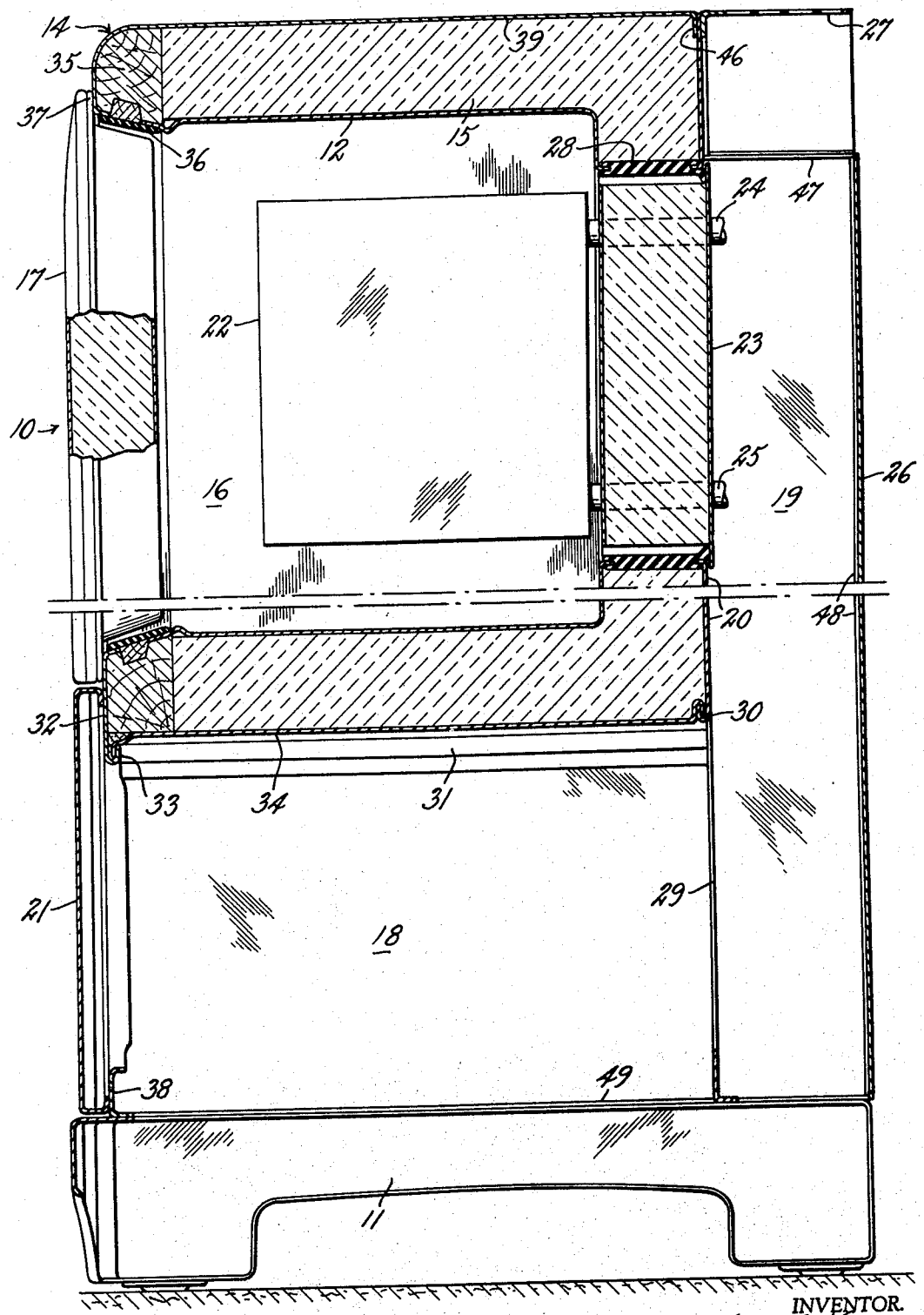


Fig. 1.

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Fig. 2

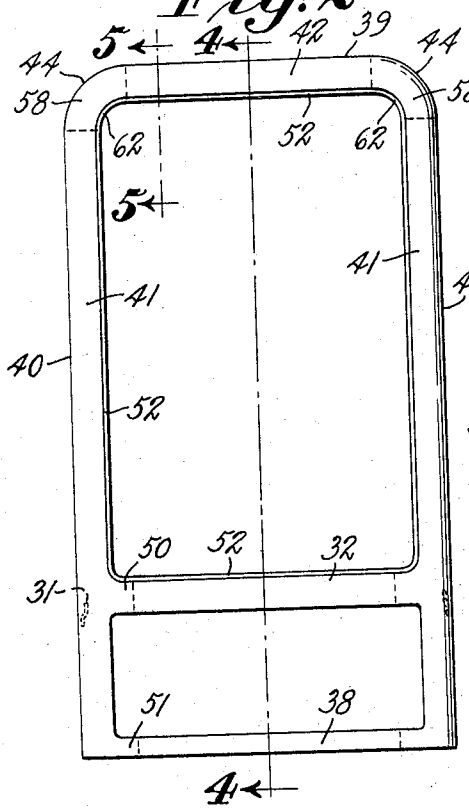


Fig. 4.

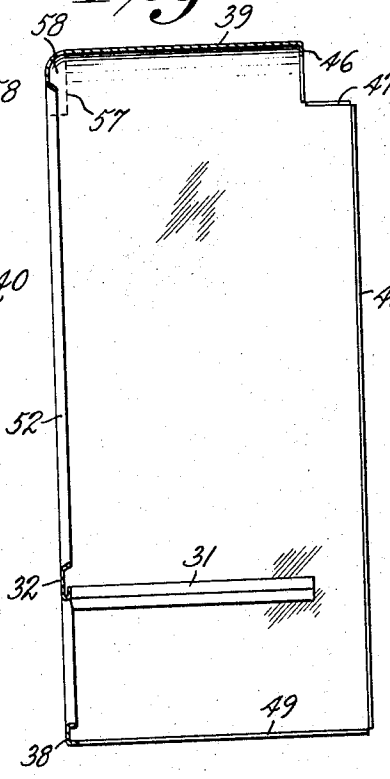


Fig. 5.

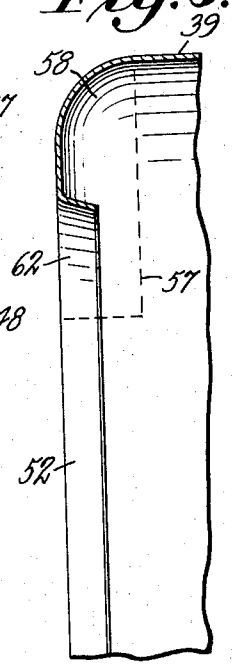


Fig. 3.

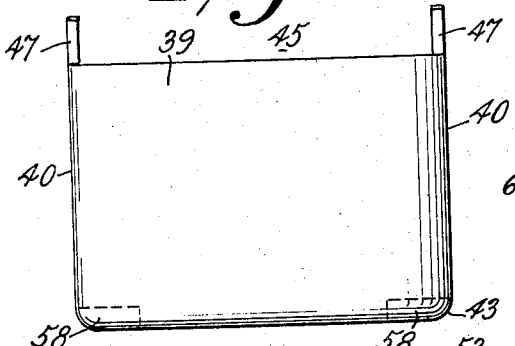


Fig. 7.

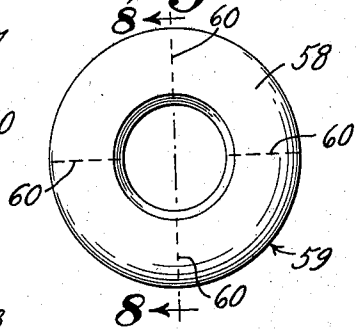
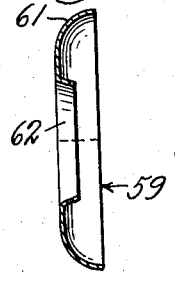


Fig. 8.



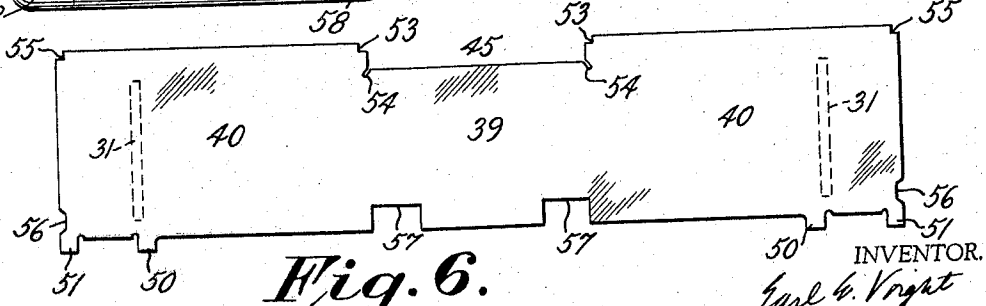


Fig. 6.

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Patented Nov. 10, 1942

2,301,467

UNITED STATES PATENT OFFICE

2,301,467

REFRIGERATOR

Earl E. Voight, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware

Application April 8, 1937, Serial No. 135,630

2 Claims. (Cl. 220—9)

My invention relates to refrigerators, and more particularly to refrigerator cabinet structure.

It is an object of the invention to provide an improvement in refrigerator cabinets having an outer shell formed from a single sheet of metal. More particularly, it is an object of the invention to provide an improvement in fabricating such a one piece outer shell having rounded corners about the entire front and at the top, whereby the forming of the top front corners may be simplified and accurately controlled.

I accomplish this by forming from a single sheet of metal a substantially U-shaped shell having rounded corners about the entire front and at the top thereof, the shell having recesses or notches at the top front corners, and securing in the notches inserts or metal sections of such shape that smooth rounded surfaces are provided at these regions which conform to the contour of both the rounded corners at the top and front of the shell.

The invention, together with the above and other objects and advantages thereof, will be more fully understood from the following description taken in connection with the accompanying drawings forming a part of this specification, and of which Fig. 1 is a side vertical section of a refrigerator cabinet embodying the invention; Fig. 2 is a front elevation of the outer shell of the cabinet shown in Fig. 1; Fig. 3 is a top plan view of the shell shown in Fig. 2; Fig. 4 is a sectional view taken at line 4—4 of Fig. 2; Fig. 5 is an enlarged fragmentary sectional view taken at line 5—5 of Fig. 2; Fig. 6 is a plan view of the metal sheet from which the shell shown in Figs. 2 and 3 is formed; Fig. 7 is a plan view of a ring-shaped cup which may be divided into sections to provide the top front corners of the shell shown in Figs. 2 and 3; and Fig. 8 is a sectional view taken at line 8—8 of Fig. 7 to illustrate more clearly the shape of the ring-shaped cup.

Referring to Fig. 1, I have shown the invention embodied in a refrigerator comprising a cabinet 10 provided with a base 11 and having an inner metal shell or liner 12 arranged within an outer shell 14 and insulated therefrom with any suitable insulating material 15. The inner shell 12 defines a thermally insulated storage space 16 having an opening, and at the opening a door 17 is hinged to the front of the cabinet. Below the storage space 16 is a compartment 18 which extends to the rear of the cabinet and communicates with an upward extending compartment 19 which is substantially the same height as the cabinet 10. The lateral side walls of the outer shell 14 extend or project beyond a metal plate or rear panel 20 of the rear insulated wall of the storage space 16 to provide the compartment 19, and at the opening of the lower compartment 18 a door 21 is hinged to the front of the cabinet.

A cooling element or evaporator 22 of a refrigerating system is disposed in the storage space 16 to maintain the latter at a desired low temperature. The refrigerating system, which may be either of an absorption or compression type, may be housed in the lower and vertical compartments 18 and 19. In order to arrange the cooling element 22 within the storage space 16, the rear wall of the storage space may be provided with an opening having a removably wall part or cover 23 through which extend conduits 24 and 25 connecting the cooling element 22 with other parts of the refrigerating system.

The heat rejecting parts of the system are preferably housed in the vertical compartment 19 which forms a flue through which an upward flow of air is induced by natural draft. The vertically extending compartment 19 may be partly or fully enclosed by a rear plate 26. A perforated enclosure member 27 is fixed to the upper part of compartment 19 to permit upward flow of air in the latter. The parts of the refrigerating system associated with the cooling element 22 have not been shown in the drawings, since their illustration is not necessary for an understanding of the present invention.

The rear panel 20 serves as a closure member and extends between the lateral side walls of the outer shell 14. The upper part of panel 20 and the rear wall of liner 12 are provided with flanged openings to receive the grooved edges of a trim 28 defining the opening for the removable cover 23.

The lower part of panel 20 is provided with an enlarged opening 29 whereby the compartments 18 and 19 are in open communication. The upper edge of opening 29 is bent back upon itself to form a groove 30 which is substantially at the same height as grooves formed by members 31 at the side walls 40 of the outer shell. The lower edge of a cross member 32 at the front of the cabinet is also bent back upon itself to provide a groove 33. A bottom plate 34 having a flange about the periphery thereof is supported in the grooves formed by the upturned edges of the panel opening 29 and cross member 32, and the members 31 disposed at the side walls of the outer shell. The periphery of bottom plate

34 is sealed with a suitable compound to the rear panel 20, side walls of the outer shell 14, and cross member 32. The manner in which the bottom plate 34 is arranged and supported within the outer shell 14 is fully described and claimed in application Serial No. 135,628 of H. Wallace, filed April 8, 1937, now Patent No. 2,234,639, granted March 11, 1941. The bottom plate 34 and rear panel 20 form a container within the shell 14 into which the insulating material 15 and liner 12 are insertable through the front of the cabinet.

The edges of the outer shell 14 and liner 12 about the upper door opening are secured to a wooden frame 35. About the upper door opening are secured finishing or trim strips 36 which are preferably formed of an insulating material, such as the material commercially known as Bakelite. The door 17 is provided with a ledge to which is fixed a gasket 37 which bears against the outer shell 14 and cross member 32 when the door is in its closed position. The lower door 21 in its closed position bears against the front of the outer shell 14, cross member 32, and a lower cross member 38 which extends across the front of the cabinet.

Referring to Figs. 2 to 4 inclusive, shell 14 is formed from a single sheet of metal to provide the top 39, lateral side walls 40, and marginal front portions 41 and 42, the shell being substantially U-shaped and having rounded corners about the entire front and at the top thereof, as indicated at 43 and 44, respectively. Across the rear of the top 39 is provided an elongated recess or opening 45 having right angle flanges 46 and 47, as shown in Fig. 4, for locating and positioning the rear panel 20 and perforated enclosure member 27. The rear edges of the lateral side walls 40 are provided with flanges 48 to which the plate 26 is secured, and the lower edges thereof are provided with flanges 49 for securing the shell to the base 11.

The front marginal portions 41 are provided with inwardly extending projections or tabs 50 and 51 which are directly opposite each other and to which the cross members 32 and 38 are secured to define the openings for the upper and lower compartments 16 and 18, respectively. The front marginal portions 41 and 42, upper edges of projections 50 and the upper edge of cross member 32 are provided with an inclined flange 52 which extends rearwardly from the front of the shell.

The sheet of metal forming the outer shell 14 is blanked from a flat sheet which is of the general shape shown in Fig. 6. To provide the rear flanges 46 and 47, the outer corners of recess 45 are notched at 53 and the inner corners thereof are slotted at 54. The lateral edges of the sheet are notched at 55 and 56 to provide the rear flanges 48 and the lower flanges 49 of the lateral side walls 40. The front edge of the sheet is provided with the projections or tabs 50 and 51 to which the cross members 32 and 38 are secured. Two rectangular-shaped notches or recesses 57, which are opposite the end portions of recess 45, are provided at the front edge of the sheet for reasons which will presently described.

After blanking the sheet 14 shown in Fig. 6 and described above, the longitudinal and lateral edges of the sheet are bent in suitable apparatus to form all of the flanges in a single operation. After the flanging operation, the front longitudinal edge of the sheet is bent to form the front rounded corners and front marginal portions 41 and 42. With the metal members 31 secured to the sheet, as by welding, for example, the sheet is made into the shape of a U by forming over a rounded die. The upper corners of the U-shaped shell are rounded with the bending taking place at the region of the notches 57.

In accordance with my invention, in order to provide smooth rounded surfaces at the top front of the shell, these regions of the shell are provided with the notches or recesses 57, and metal sections or inserts 58 are secured in the notches, the metal sections or inserts being of such shape that smooth rounded surfaces are provided which conform to the contour of both the rounded corners at the top and front of the shell.

Although the inserts 58 may be individually stamped from sheet metal I preferably provide ring-shaped cups 59 of the shape shown in Figs. 7 and 8, and divide each cup into four parts, as indicated by the dotted lines 60, to provide the inserts 58.

The cup 59 is of such size that the outer periphery thereof conforms to the rounded corners 44 at the top of the cabinet. The cup 59 is provided with a rounded shoulder 61 which conforms to the rounded corners at the front of the shell. When one segment or part of the cup 59 is positioned in a notch 57, therefore, smooth rounded surfaces are provided which conform to the contour of both the rounded corners at the top and the front of the shell. The inserts may be secured to the shell 14 by welding or in any other suitable manner. The cup 59 is formed to provide an inclined flange 62 about the opening thereof. When the inserts 58 are secured in position, the inclined flanges 62 connect the flanges 52 of the front marginal portions 41 and 42 to provide a continuous flange extending about the entire opening of the upper storage space 16.

By forming the top front corners of the shell 14 with the inserts 58, the fabrication of the shell from a single sheet of metal is simplified considerably. Since the inserts are shaped before they are welded in position at the notches, smooth surfaces are always insured at the top front of the shell. After a shell has been rendered rustproof and finished, as with lacquer, for example, the entire outer surface presents a smooth appearance with no indication of the upper front corners having been formed by notching and subsequent welding of metal sections or inserts.

While a single embodiment of my improved refrigerator cabinet structure has been shown and described, such variations and modifications are contemplated which come within the true spirit and scope of my invention, as pointed out in the following claims.

What is claimed is:

1. An outer shell for a refrigerator cabinet including a top and two lateral sides made from a metallic blank, the unbent blank having spaced rectangular-shaped notches at the forward edge intermediate the ends thereof, said shell having rounded corners at the juncture of the top and the lateral sides at the region of the notches, the forward edge at the top between the notches being bent to form a rounded corner and a top marginal front portion extending from such corner, the forward edges at the lateral sides between the notches and the ends of the blank being bent to form rounded corners and side marginal portions extending from such rounded corners, the notches forming gaps in the upper forward corners after the blank is bent to form

the top and lateral sides and the front marginal portions, and metal inserts for the formed outer shell connecting the top and side front marginal portions and filling the gaps formed by the notches so as to provide smooth rounded surfaces at the upper forward corners of the outer shell, said inserts being segments of an annular-shaped member having the radius of the peripheral edge conforming to the contour of the rounded corner of the top of the shell, and the segments in section having rounded shoulders conforming to the rounded corners from which the marginal front portions extend.

2. An outer shell for a refrigerator cabinet including a top and two lateral sides made from a metallic blank having spaced notches in the forward edge intermediate the ends thereof, said shell having rounded corners at the juncture of the top and the lateral sides at the regions of the notches, the forward edge at the top between the notches being bent to form a rounded corner and a top marginal front portion extending from such rounded corner, the forward edges at the lateral sides between the notches and the ends of the blank being bent to form rounded corners and side marginal front portions extending from such rounded corners, the notches forming gaps at the upper forward corners after the blank is bent to form the top and lateral sides and the front marginal portions, metal inserts in the notches connecting the top and side front marginal portions and filling the gaps formed by the notches so as to provide smooth rounded surfaces at the upper forward corners at the front of the outer shell, the side front marginal portions being provided with tabs extending inwardly substantially opposite each other, the corners formed by the upper edges of the tabs and the side front marginal portions and also the upper inner corners formed by the inserts being rounded, the marginal front portions including the tabs and inserts having a flange extending rearwardly therefrom, a cross member extending between and secured to said tabs, and said cross member also having a flange extending rearwardly therefrom and forming a continuation of the rearwardly extending flange at the marginal front portions and inserts and tabs.

EARL E. VOIGHT.