

Dec. 6, 1966

G. J. VANEGAS

3,290,109

REFRIGERATOR CABINET INCLUDING ADJUSTABLE HINGE MOUNTING

Filed July 30, 1965

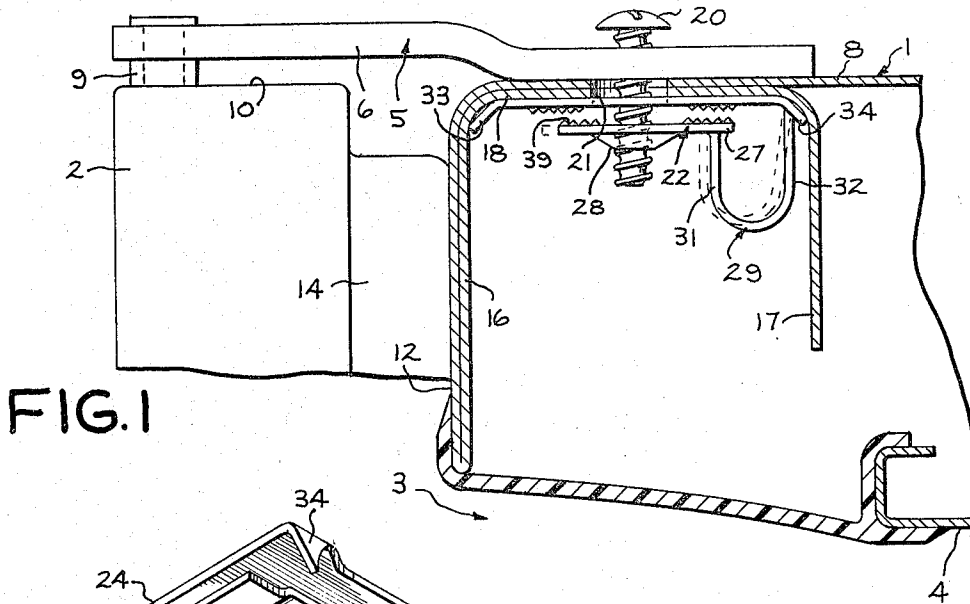


FIG. 1

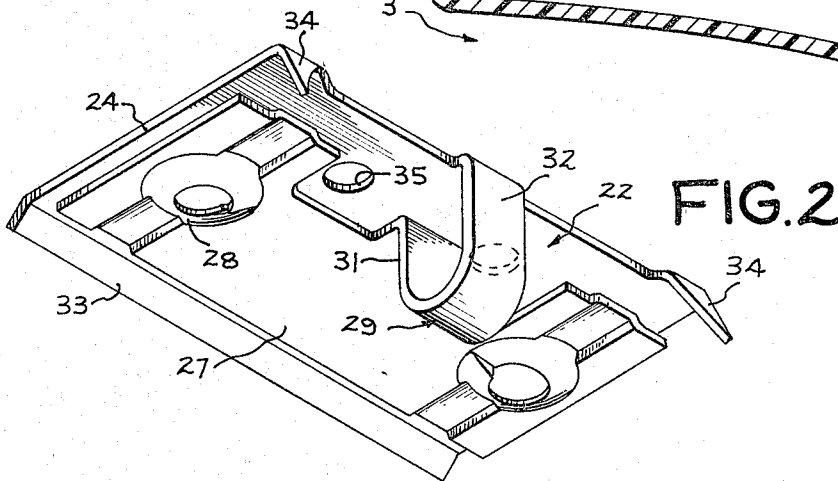


FIG. 2

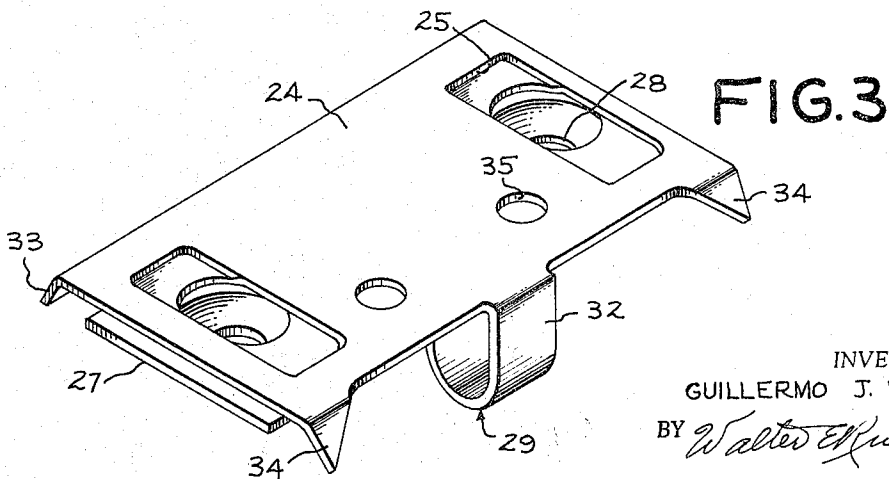


FIG. 3

INVENTOR.
GUILLERMO J. VANEGAS
BY *Walter E. Kule*
HIS ATTORNEY

1

3,290,109

REFRIGERATOR CABINET INCLUDING ADJUSTABLE HINGE MOUNTING

Guillermo J. Vanegas, Louisville, Ky., assignor to General Electric Company, a corporation of New York
Filed July 30, 1965, Ser. No. 476,048
3 Claims. (Cl. 312-326)

The present invention relates to refrigerator cabinets and more particularly concerned with a cabinet including improved hinge mounting means for providing limited adjustment of the position of the door relative to the cabinet.

In the manufacture of household refrigerators and the like, it is necessary to provide an air-type seal between the cabinet face and the door closing the access opening to the refrigerator cabinet. Due to manufacturing tolerances, it is desirable to provide a simple and effective means for limited in-and-out adjustment of the door relative to the cabinet face after the door has been assembled on the cabinet.

It is a primary object of my present invention to provide a simple and low cost means for adjusting the hinge mounting of a door on a refrigerator cabinet for the purpose of providing the required seal between the door and the cabinet face.

Another object of the present invention is to provide, in combination with a refrigerator cabinet, hinge means for pivotally mounting a door on the face of the cabinet and an improved nut strip for securing the hinge to the cabinet, which nut strip is specifically designed to permit adjustment of the door relative to the cabinet.

Further objects and advantages of the invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In accordance with the present invention, there is provided a refrigerator cabinet having an access in the front wall thereof and a door for closing the access opening. The door is pivotally mounted along one edge by hinge means including a pivot-type hinge pivotally engaging an upper corner of the door and including a hinge leaf overlying the top wall of the cabinet. This hinge leaf is secured to the cabinet by at least one mounting screw and an improved nut strip threadably engaging the mounting screw and designed to provide limited adjustment of the position of the hinge leaf, and hence the door, relative to the cabinet. Specially, the nut strip is composed of sheet metal and comprises a base portion adapted to be secured to the inner surface of the top wall of the cabinet and a screw receiving portion overlying and normally spaced from the base portion and connected thereto by a U-shaped connecting portion, the legs of which extend generally perpendicular to the base and screw receiving portions. The top wall of the cabinet and the base portion of the nut strip include slots or apertures through which the mounting screw extends and which are somewhat larger than the screw so as to provide limited movement thereof within the slots of apertures. The U-shaped connecting portion components of the nut strip is relatively narrow, or in other words, of relatively small cross-section so that it is sufficiently flexible to permit relative movement of the base and screw receiving portions when the mounting screw is loosened. Preferably, the base and screw receiving portions also include interlocking corrugations on opposed surfaces thereof so that when the screw is tightened thereby bringing the screw receiving portion into engagement with the base portion, these corrugations lock the two portions and thereby prevent movement of the hinge relative to the cabinet.

2

For a better understanding of the invention reference may be had to the accompanying drawing in which:

FIGURE 1 is an elevational view, partly in section, of a portion of a cabinet showing the detailed construction of the present invention;

FIGURE 2 is a perspective view of the nut strip forming part of the present invention; and

FIGURE 3 is a second perspective view of the nut strip illustrating additional features thereof.

Referring to the drawing, there is shown, by way of example, a household refrigerator cabinet including an outer shell 1 and having a door 2 mounted on the front portion of the cabinet for the purpose of closing the access opening 3 to a storage compartment within the cabinet. This door overlaps the face portions of the cabinet surrounding the access opening and is mounted on the cabinet by hinge means including an upper hinge 5 and a lower hinge (not shown) which permit the door to pivot about a vertical axis such that when the door is moved to open position it will not extend beyond the plane of the hinge side of the cabinet.

The cabinet structure also includes an inner liner 4 within the shell 1 forming the actual storage compartment within the cabinet and spaced from the illustrated outer walls of the cabinet with insulation therebetween.

The present invention is concerned with the hinge means 5 provided for pivotally connecting the upper portion of the door to the cabinet. This hinge 5 includes a hinge leaf 6 overlying the top wall 8 of the cabinet and a hinge pin 9 extending into the upper edge 10 of the door so that the pin 9 provides the upper pivot point for the door.

In accordance with the usual practice, the space between the door 2 and the face 12 of the cabinet is sealed by means of a gasket 14 which is mounted on the door and which engages the face of the cabinet surrounding the entire access opening 3 when the door is closed.

Also, in accordance with the usual practice, the cabinet shell 1 which is formed of sheet metal includes a strengthening flange about the access opening and in the illustrated embodiment of the invention this strengthening flange comprises an integral channel section including a front wall 16 in contact with the rear surface of the face portion 12 and a rear wall 17 spaced from the front wall 16 and connected to the front wall by means of a rearwardly extending base or bottom wall 18.

For the purpose of securing the hinge leaf 6 to the top wall 8 and for providing limited adjustment of this hinge leaf and hence the door 2 relative to the face portion 12 of the cabinet, there is provided one or more mounting screws 20. Each mounting screw 20 extends through an enlarged slot 21 in the top wall 8 of the cabinet, or more specifically in the illustrated embodiment, through the top wall 8 and also the bottom wall portion 18 of the reinforcing channel and is threadably engaged by a novel nut strip generally indicated by the numeral 22 positioned within the reinforcing channel.

This nut strip, as is shown in greater detail in FIGURES 2 and 3 of the drawing, comprises a base portion 24 having one or more elongated slots or apertures 25 substantially coextensive with the slots 21. The nut strip 22 also includes a screw receiving portion 27 parallel to and initially spaced from the base portion 24 and including one or more nut portions 28 forming thread engaging means for receiving and threadably engaging one or more screws 20.

The portions 24 and 27 of the nut strip 22 are interconnected by means of a generally U-shaped connecting portion 29 extending generally perpendicular to the base portion 24 and the screw receiving portion 27 and designed to provide limited hinge adjusting movement be-

3

tween the base portion 24 and the screw receiving portion 27.

More specifically, the two legs 31 and 32 of this interconnecting portion 29, which are respectively connected to the screw receiving portion 27 and the base portion 24, extend perpendicular thereto and are so constructed as to possess a limited degree of flexibility whereby this interconnecting portion 29 can be deformed to permit relative movement between the screw receiving portion 27 and the base 24 to permit limited adjustment of the hinge leaf 6 relative to the cabinet.

The base portion 24 is designed to be connected or anchored to the top wall 8 and to this end may be provided with an angled edge 33 along one edge thereof and cooperating prongs 34 on the opposite edge so arranged that when the nut strip is pressed into the reinforcing channel on the cabinet, the edge 33 and the prongs 34 bite into the opposed walls 16 and 17 of the channel to firmly anchor the base portion 24 within the channel. Alternatively, for cabinets which do not include reinforcing means including both side walls of the channel, that is, walls 16 and 17, the base portion 24 of the nut strip may be provided with one or more openings 35 for receiving rivets by means of which the base portion 24 is riveted directly to the top wall 8 of the cabinet.

In the assembly of the cabinet door on the face of the cabinet employing the present invention, the nut strip 22 is positioned within the reinforcing channel or is directly secured to the top wall 8 of the cabinet after which the hinge leaf is pivotally mounted onto the door 2 by means of the hinge pin 9 and then positioned over the top wall 8 of the cabinet. The screw or screws 20 are then inserted and loosely threaded into the screw receiving portion 27 of the nut strip. The interconnecting portion 29 is sufficiently flexible so that the door 2 can then be manually moved either inwardly or outwardly relative to the cabinet face until the gasket 15 is brought into proper sealing engagement with the face of the cabinet. Thereafter tightening of the screw or screws 20 causes the screw receiving portion 27 to be pulled upwardly into frictional engagement with the base portion 24 and thereby firmly position the two portions relative to one another and hence firmly anchor the hinge leaf 6 relative to the cabinet top wall 8.

For the purpose of providing a more positive anchoring of the hinge, the opposing surfaces of the base portion 24 and screw receiving portion 27 of the nut strip are preferably provided with a plurality of serrations or corrugations shown in FIGURE 1 of the drawing designed to interlock with one another. For subsequent re-adjustment of the door relative to the cabinet base, it is necessary only to loosen the screws 20, the interconnecting portion 29 will cause the screw receiving portion 27 to move a sufficient distance to unlock the serrations 39 and permit relative movement of the hinge leaf 6 with relation to the top wall of the cabinet for the required re-alignment of the door and cabinet face.

While there has been shown and described a specific embodiment of the present invention it will be understood that it is not limited thereto and it is intended by the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination:

- a cabinet having a top wall and a front wall and an access opening in the front wall thereof,
- a door for closing said access opening,
- said top wall having a slot therein adjacent one front corner thereof,
- hinge means for supporting said door on said cabinet for pivotal movement about an axis adjacent one side edge thereof,
- said hinge means comprising a hinge leaf overlying the slot in said top wall of said cabinet and a pivot pin

4

carried by said plate and pivotally engaging an upper edge portion of said door,

means for adjustably securing said hinge leaf to said top wall for in-and-out adjustment of said door relative to the front of said cabinet comprising a screw extending downwardly through said hinge leaf and said slot,

a nut strip composed of sheet metal and comprising a base portion having an aperture therein,

a screw receiving portion overlying and normally spaced from said base portion and a U-shaped connecting portion connecting adjacent edges of said base and screw receiving portions and extending generally perpendicular to said base and screw receiving portions,

means for anchoring said base portion to the lower surface of said top wall with said aperture aligned with said slot,

said connecting portion being sufficiently flexible to permit relative movement of said base and screw receiving portions for limited adjustment of said door.

2. In combination:

a cabinet having a top wall and a front wall and an access opening in the front wall thereof,

a door for closing said access opening,

said top wall having a slot therein adjacent one front corner thereof,

hinge means for supporting said door on said cabinet for pivotal movement about an axis adjacent one side edge thereof,

said hinge means comprising a hinge leaf having a screw passage overlying the slot in said top wall of said cabinet and a pivot pin carried by said leaf and pivotally engaging an upper edge portion of said door,

means for adjustably securing said hinge leaf to said top wall for in-and-out adjustment of said door relative to the front of said cabinet comprising a screw extending downwardly through said hinge leaf and said slot,

a nut strip composed of sheet metal and comprising a base portion having an aperture therein, a screw receiving portion overlying and normally spaced from said base portion and a U-shaped connecting portion connecting adjacent edges of said base and screw receiving portions and extending generally perpendicular to said base and screw receiving portions,

means for anchoring said base portion to the lower surface of said top wall with said aperture aligned with said slot,

said connecting portion being relatively narrow and sufficiently flexible to permit relative movement of said base and screw receiving portions for limited adjustment of said door,

facial portions of said base and screw receiving portions including interlocking means to prevent relative movement thereof when said screw is tightened.

3. In combination:

a cabinet having a top wall and a front wall and an access opening in the front wall thereof,

a door for closing said access opening,

said top wall having a reinforcing channel on the inner surface thereof and a slot therein adjacent one front corner of said top wall,

hinge means for supporting said door on said cabinet for pivotal movement about an axis adjacent one side edge thereof,

said hinge means comprising a hinge leaf having a screw passage therein overlying the slot in said top wall of said cabinet and a pivot pin carried by said leaf and pivotally engaging an upper edge portion of said door,

means for adjustably securing said hinge leaf to said top wall for in-and-out adjustment of said door relative to the front of said cabinet comprising a screw extending downwardly through said hinge leaf and said slot,

5

a nut strip composed of sheet metal and comprising a base portion having an aperture therein, a screw receiving portion overlying and normally spaced from said base portion and a U-shaped connecting portion connecting adjacent edges of said base and screw receiving portions and extending generally perpendicular to said base and screw receiving portions, means for anchoring said base portion in said channel of said top wall with said aperture aligned with said slot, said connecting portion being relatively narrow and sufficiently flexible to permit relative horizontal movement of said base and screw receiving portions for limited in-and-out adjustment of said door,

6

facing portions of said base and screw receiving portions including interlocking corrugations to prevent relative movement thereof when said screw is tightened.

References Cited by the Examiner

UNITED STATES PATENTS

2,291,290	7/1942	Timmerman	-----	151—41.75
2,866,675	12/1958	Kesling	-----	312—214
2,988,414	6/1961	Crowe et al.	-----	312—326

CLAUDE A. LE ROY, *Primary Examiner.*

F. DOMOTOR, *Assistant Examiner.*