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ADJUSTABLE FREEZER DOOR MOUNT

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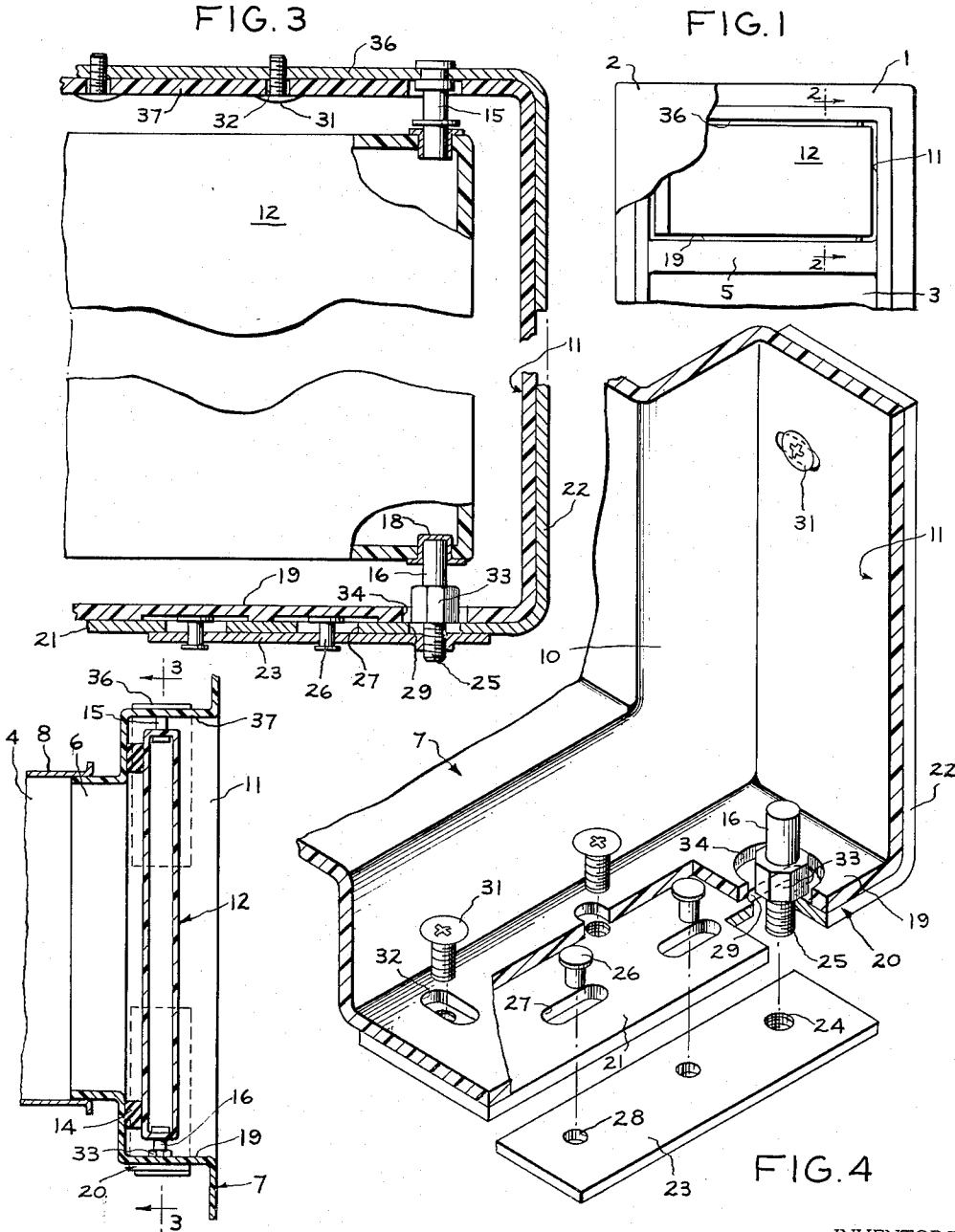


FIG. 2

FIG. 4

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1

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**ADJUSTABLE FREEZER DOOR MOUNT**

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The present invention relates to door structures for cabinets and is particularly concerned with an improved arrangement for adjustably mounting the inner or freezer door structure for a domestic refrigerator.

Many domestic refrigerators having only a single outer door include two or more separate compartments within the cabinet designed to operate at different temperatures. The usual refrigerator of this type includes a fresh food storage compartment and a somewhat smaller freezer compartment separated from the fresh food compartment by an insulated partition. In order to maintain the desired low temperature conditions in the freezer compartment, it is generally necessary and desirable to provide a separate or inner door which closes the access opening to the freezer compartment even when the outer cabinet door is opened. To prevent any air circulation between the two compartments, this inner door may include a gasket adapted to engage the face portion of the freezer compartment.

The present invention has as a principal object an improved means for pivotally mounting the inner door relative to the access opening to the freezer compartment whereby the door can be easily squared or oriented relative to the access opening to that compartment and can also be adjusted inwardly or outwardly to obtain the desired gasket seal.

Further and more specific 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 a part of this specification.

In accordance with the present invention there is provided a refrigerator cabinet including a storage compartment having a frame member surrounding or defining the access opening to the compartment. Preferably this frame member is composed of a plastic or other heat insulating material. The frame member includes a face portion surrounding the access opening against which the door for closing the access opening is adapted to seat and a forwardly extending flange portion surrounding the face portion and defining a door receiving recess. Upper and lower pivot pins secured to this flange portion and pivotally engaging the upper and lower edges of the door adjacent one vertical edge thereof support the door relative to the access opening. In order that the door be adjustable for the spacing thereof with reference to face portion of the frame member and for the purpose of squaring the door relative to the access opening, at least one of the pivot pins is adjustably supported on the frame member. This adjustable mounting means is disposed in contact with the outer surface of the flange portion of the frame member and comprises a support member contacting the flange portion and a nut strip member loosely secured to the opposite face of the plate member. The support member has a slot therein for receiving a threaded end of the pivot pin which threadably engages the nut strip, the other or door engaging end of the pivot pin extending through a hole or aperture provided in the frame flange portion. A locking bolt on the pivot pin engages the support member and serves to lock the nut

2

strip relative to the member. The support member is secured to the frame flange portion by means of screws passing through slots in the flange portion. These slots in the flange portion extend in a direction transverse to the slot in the plate member. By this arrangement the slots in the frame flange portion permit in and out adjustment of the pivot pin relative to the frame face portion while the slot in the support member permits movement of the adjustable pivot pin in a direction parallel to the plane of the door for the purpose of orienting or squaring the door relative to the access opening.

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

FIG. 1 is a fragmentary front elevational view of a domestic refrigerator illustrating an embodiment of the present invention;

FIG. 2 is an enlarged sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is an enlarged sectional view taken along line 3-3 of FIG. 2; and

FIG. 4 is an exploded view illustrating certain details of the invention.

With reference to the accompanying drawing, there is illustrated a refrigerator cabinet 1 provided with an outer door 2 and including a fresh food compartment 3 and a freezer compartment 4 positioned above the fresh food storage compartment 3 and separated therefrom by an insulated partition 5. The freezer compartment 4 has an access opening 6 at the front thereof which is defined or surrounded by a frame member 7 which is preferably composed of plastic material in order to insulate the inner metal walls 8 of the freezer compartment 4 from the adjacent portions of the cabinet.

The frame member 7 of generally rectangular configuration is shaped to include a face portion 10 surrounding the access opening 6 and a forwardly extending flange portion 11 surrounding the face portion 10 and defining a door receiving recess in which is mounted an inner door 12 for closing the access opening to the freezer compartment. The door 12 which has a gasket 14 for sealing the space between the inner surface of the door and the frame face portion 10 is pivotally mounted adjacent one vertical edge thereof by means of pivot pins 15 and 16 which are supported on the frame member 7 and which pivotally engage the top and bottom edges of the door 12.

As is shown more particularly in FIG. 3 of the drawing, the inner door 12 is preferably composed of a plastic material and is of a hollow or double wall construction for heat insulation purposes. The upper pivot pin 15 extends through a collar provided in the top edge of the door 12 and into the interior of the door while the lower pivot pin 16 extends into a thimble 18 in the lower edge of the door, the thimble 18 preventing the door 12 from sliding downwardly onto the pin 16.

With the door 12 positioned within the rectangular opening defined by the frame flange portion 11 adjustments may be required to square or center the door within the rectangular opening defined by the flange portion 11 or to obtain the desired gasket seal between the door and the frame face portion 10.

In accordance with the present invention, these adjustments are obtained by means of an improved arrangement for mounting one or both of the pivot pins on the frame 7. In the embodiment of the invention illustrated in the drawing this adjustable feature is illustrated in connection with the lower pivot pin 16. In order that this pivot pin be adjustable for limited movement of the portion of the door engaged thereby in any direction, there is provided an adjustable mounting which is designed to be

3

secured to the under or hidden surface of the lower flange portion 19 adjacent to the pivoted side of the door 12. The adjustable mounting means comprises a support member 20 including a horizontal portion 21 adapted to engage the lower face of the flange section 19. In the illustrated embodiment of the invention the member 20 is in the form of a bracket with the other arm 22 extending upwardly around the corner of the flange portion 19 for strengthening purposes. Loosely secured to the arm or horizontal portion 21 is a nut strip 23 having a threaded opening 24 for receiving the lower threaded end 25 of the pivot pin 16 which passes through a slot 29 in member 20. The nut strip 23 is slidably secured to the horizontal arm 21 by means of rivets 26 extending through slots 27 in the horizontal arm 21 and rivet holes 28 in nut strip 23. A locking nut 33 is provided to lock members 20 and 23 against movement relative to one another.

The adjustable mount comprising the members 20 and 23 is secured to the flange section 19 by means of screws 31 extending through slots 32 provided in the flange section 19, these slots 32 extending in a direction transverse or perpendicular to the direction of the slot 29. The screws 31 threadably engage only the member 20.

By virtue of these slots 29 and 32 extending at right angles to one another, the pin 16 which extends through a hole or opening 34 bottom flange section 19 of a size sufficient to permit horizontal movement of the pin in any direction can be so towards or away from the face portion 10 moved to obtain in-and-out adjustment of the door 12 relative to the face portion 10 in order to obtain the proper gasket contact with the face portion or in a direction parallel to the plane of the door for the purpose of squaring the door within the flange portion 11. For in-and-out adjustment of the door, it is necessary only to loosen the screws 31 so that the screws are free to move in the slots 32. Then by applying pressure to the door, the door and the pin 16 can be moved inwardly towards the face portion 10 or away from that face portion until the desired compression of the gasket 14 is obtained. Thereafter, the screws 31 are tightened so that the heads thereof contact the flange section 19 and lock the adjustable mount to the frame 7. In order to square the door within the flange portion 11, the locking nut 33 on the pin 16 is loosened thereby freeing the nut strip 23 for longitudinal movement relative to the member 20. With the door closed, the latch or opposite end of the door can be moved up or down resulting in movement of the pin 16 either to the left or to the right as viewed in FIG. 3. When the door has been squared within the opening defined by the flange portion 11, the locking nut 33 is again tightened to lock the nut strip and hence the pin 16 against further movement relative to the member 20 and hence the frame 7.

With the pin 16 engaging the thimble 18 in the lower edge of the door 12 and with the upper pin 15 extending through and into the hollow interior of the door limited vertical adjustment of the entire door is also possible. For this purpose the lock nut 33 can be loosened and the pin 16 rotated to raise or lower the pin relative to the nut strip 23 thereby raising or lowering the entire door 12.

While the three-way adjustable feature of the present invention has been described with particular reference to the lower pin 16, it will be obvious that the upper pin 15 may be similarly mounted. However, for most purposes it will be sufficient if the upper pin 15 be adjustably mounted only for the purpose of obtaining the proper door spacing and gasket seal in the upper door areas. To this end the upper pin may be rigidly secured to a member 36 corresponding to member 20 and the member 36 fastened to the exterior or upper side of the top flange section 37 in the same manner as the member 20 is secured to the lower flange section 19, that is by means of screws 31 extending through slots 32. By this arrangement either the upper or the lower portions or both portions of the

4

door 12 may be adjusted inwardly or outwardly with reference to the face portion 10 while the desired squaring of the door is obtained by the lateral adjustment feature provided in the mounting for the lower pin 16.

While there has been shown and described a particular embodiment of the present invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention, and it is intended by the appended claims to cover all such changes and modifications which fall within the true spirit and scope of the invention.

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

1. A refrigerator cabinet comprising a storage compartment including a frame defining an access opening to said compartment, said frame comprising a face portion surrounding said access opening and forwardly extending flange portion surrounding said face portion, a door for closing said access opening, pivot pins respectively supported on the top and bottom sections of said flange portion and pivotally engaging the upper and lower edges of said door, and means for adjustably mounting at least one of said pivot pins on said frame comprising a support member having one face contacting the outer surface of one of said sections and having a pivot pin receiving slot therein, a nut strip member disposed on the opposite face of said support member and slidably secured thereto, said one of said pivot pins having a threaded end extending through said slot and threadably engaging said nut strip member, said frame having an opening therein for receiving the other end of said one of said pivot pins and a slot extending in a direction transverse to said slot in said support member, means for adjustably securing said support member to said flange portion comprising a screw extending through said slot in said flange portion and threaded into said support member, and a locking nut on said one of said pivot pins for engaging said support member and positioning said one of said pivot pins relative to said support member, said slots in said flange portion and said support member providing means for adjusting said door relative to said face portion and squaring said door within the space defined by said flange portion.

2. A refrigerator cabinet comprising a storage compartment including a rectangular frame defining an access opening to said compartment, said frame comprising a face portion surrounding said access opening and a forwardly extending flange portion surrounding said face portion and defining a rectangular door receiving recess, a door for closing said access opening, pivot pins respectively supported on the top and bottom sections of said flange portion and pivotally engaging the upper and lower edges of said door for pivotally supporting said door in said recess, and means for adjustably mounting one of said pivot pins on said frame comprising a support member having one face contacting the outer surface of one of said sections and having a longitudinally extending pivot pin receiving slot and a second longitudinally extending slot therein extending parallel to the plane of the door when said door is in a closed position, a nut strip member disposed on the opposite face of said support member, fastening means extending through said second slot and engaging said nut strip member for slidably securing said nut strip member to said support member for longitudinal movement thereof relative to said support member, said one of said pivot pins having a threaded end extending through said pin receiving slot and threadably engaging said nut strip member, said frame having an opening therein for receiving the other end of said one of said pivot pins and slots extending in a direction transverse to said slots in said support member, means for adjustably securing said support member to said flange portion comprising screws extending through said slots in said flange portion and threaded

5

into said support member, and a locking nut on said one of said pivot pins and disposed in said opening in said frame for engaging said support member and positioning said one of said pivot pins relative to said support member, said slots in said flange portion providing means for adjusting said door relative to said face portion and said slots in said support member providing means for squaring said door within the recess defined

6

by said flange portion while said door is in its closed position.

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