May 20, 1941. H. H. CRIMMEL 2,242,903

REFRIGERATOR AND TRAY CONSTRUCTION

Filed March 14, 1938

FIG. 1

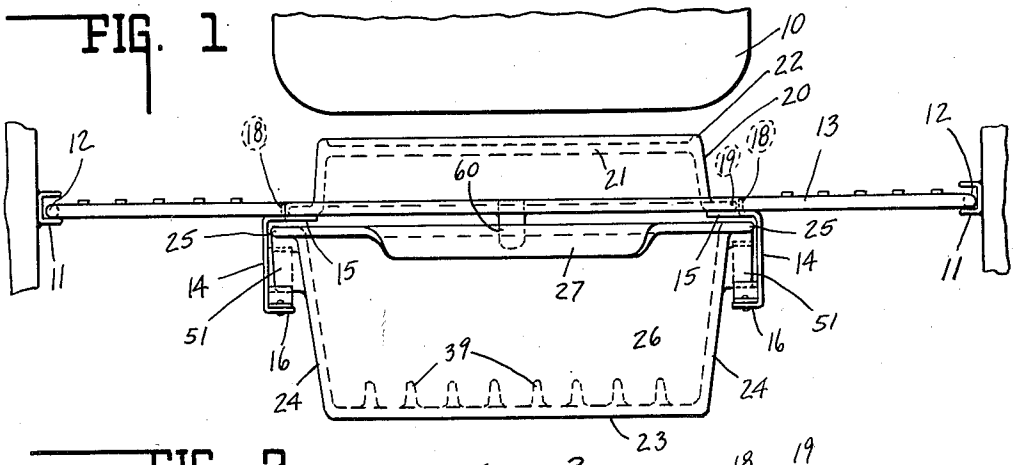


FIG. 2

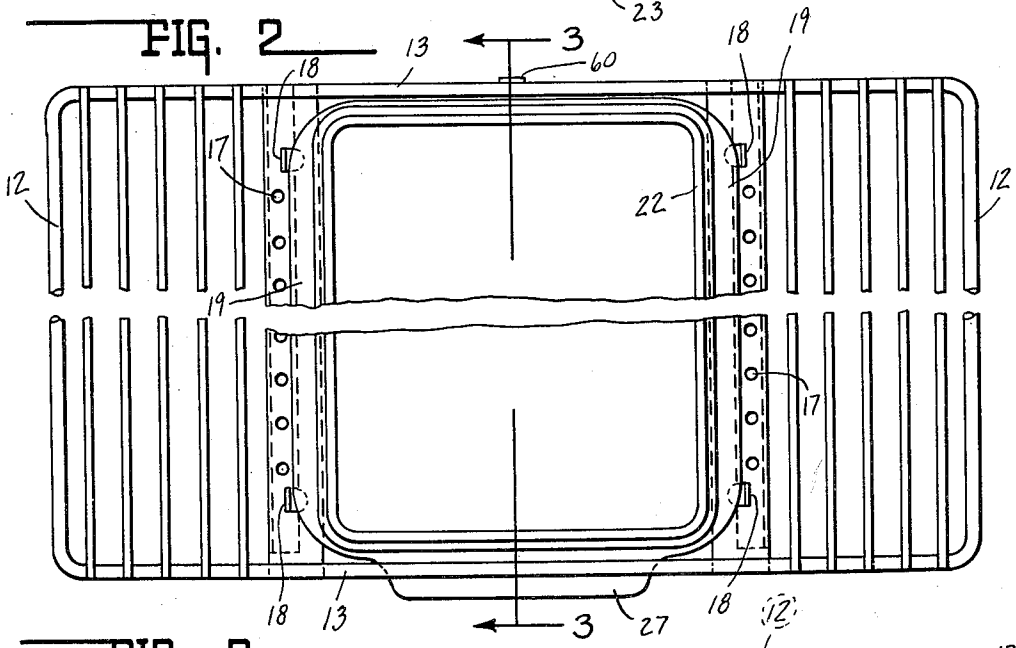
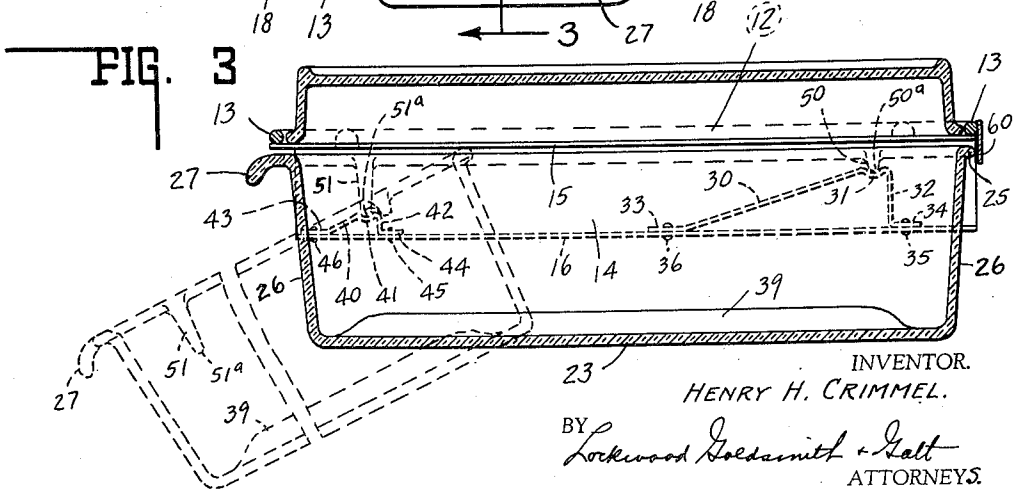


FIG. 3



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REFRIGERATOR AND TRAY CONSTRUCTION

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14 Claims. (Cl. 62—103)

This invention relates to a covered tray structure assembly peculiarly adapted for mechanical type refrigerators as distinguished from ice cooled refrigerators.

The chief object of this invention is to provide a tray structure of the covered type, the parts of which are so associated together and supported that the bottom or tray portion as distinguished from the cover portion, may be moved, into non-registering position relative to the latter for content exposure, by one hand, leaving the other hand free for content removal or article insertion, as the case may be.

Another chief object of the invention is to provide in a structure accomplishing the foregoing object, a relationship whereby, in addition to a so-called sliding separation between the cover and bottom structure, the same have a vertical or lateral separation so that when the cover structure is of inverted tray character, articles of a height greater than the depth of the bottom tray may be supplied thereto and removed therefrom without undue difficulty and more especially not requiring complete disassociation of the bottom tray from the cover.

Another chief object of the invention is to prevent complete accidental sliding separation between the cover and the bottom tray, except whenever said separation intentionally is desired.

Another object of the invention is to provide a covered tray structure positioned beneath the cooling unit of the refrigerator and so constructed that in the event of accidental, relatively minimum defrosting, the condensate is collected by the cover structure in a manner that is non-objectionable under normal circumstances and thereby prevents discharge of said minimum condensate over articles in the refrigerator positioned beneath the tray structure.

A further object of the invention is to provide a tray structure positioned as aforesaid and so constructed that in the event of accidental defrosting of a maximum character, the condensate is suitably collected with a minimum amount of article spoilage due to condensate contact. In other words, this maximum condensate discharge is localized.

A further feature of the invention is to provide a tray structure of the character above set forth and positioned as aforesaid, whereby the same upon content removal, may be utilized for the collection of condensate when the refrigerating unit is initially defrosted, or if desired, a portion of the tray structure (the cover) may be inverted and utilized as an independent tray without removing the contents from the bottom tray structure.

The various features of the invention will be set forth more fully hereinafter as well as other objects, the chief feature consisting in a combination tray structure, whereby one or more of the foregoing objects is accomplished.

The full nature of the invention will be set forth more fully in the accompanying drawing and the following description and claims.

In the drawing:

Fig. 1 is a front elevational view of a tray structure embodying the invention in juxtaposition to a refrigerating unit of a mechanical refrigerator, in which a supporting rack is included and shown and is an operative part of the tray structure.

Fig. 2 is a top plan view of the tray structure with the refrigerator rack associated therewith.

Fig. 3 is a longitudinal sectional view through the tray and rack structure shown in Fig. 2 and is taken along line 3—3 of Fig. 2 and in the direction of the arrows, the full lines indicating the tray structure in covered tray relation, the dotted lines indicating the bottom structure in dropped and open relation.

In the drawing 10 indicates the refrigerating unit of a so-called mechanical refrigerator, the remainder thereof being intentionally omitted. 11 indicates a pair of spaced support structures carried by opposite walls, or the like, of the mechanical refrigerator for slidably receiving a rack structure, 12 indicating the opposite parallel portions thereof and 13 indicating the forward and rear connecting portions thereof. This type of rack support may be modified as desired or required, being merely set forth and illustrated herein as a conventional type of rack support for the portions carried thereby which have operative association with the cover and bottom portions of the tray structure embodying the invention.

Extending from front to back and in parallel relation and secured to and supported by the rack structure, is a pair of opposed channels having the vertical portions 14, the upper portions 15 and the lower portions 16. As shown in Fig. 2, the top portion 15 is provided with a plurality of apertures 17 for a purpose hereinafter to be set forth.

Extending upwardly from the top portion 15 of each rail are a plurality of spaced and aligned projections 18 which constitute a guide and retainer for a cover structure having the rim portion 19, side wall portion 20 and the main body

portion 21. The side wall portion 20 is extended upwardly to form a rim 22 for a purpose hereinafter to be set forth. Since the track structure represented by the two opposed channels is secured in suspended relation to the rack structure, the front and back cross members 13 of the rack structure also serve as locating means for the cover of the tray structure. This tray structure may be of any suitable material, such as glass, metal, porcelain or enamel protected, or otherwise, so long as it is suitable for refrigerator use.

The lower tray structure or bottom includes a body portion 23, side walls 24 which are inclined upwardly and outwardly. The side walls terminate in the outwardly directed rim 25. The front and rear walls are indicated by the numeral 26 and the rim portion thereof, since it is a continuation of the rim 25, is indicated by the latter numeral.

The bottom tray structure is provided with suitable handle or gripping means. Herein the same is indicated as an extension 27 formed as an extension of the rim 25, although it may be formed as an extension upon the front side wall 26. The bottom tray structure may be of any suitable material, such as glass or metal, protected or otherwise suitable for refrigerator use.

Glass has the advantage over metal as a tray material in that the contents of the tray structure is visible from without the same, thereby eliminating the necessity of opening the tray to check the contents thereof.

As shown in the drawing, the flange or rim 25 on the lower tray engages the underface, or is juxtapositioned relative thereto, of the upper portion 15 of the opposed channel structures which are preferably of metal character. The depth or thickness of this rim is materially less than the depth or thickness between the upper and lower portions 15 and 16 of the channels.

As shown clearly in Fig. 3, each channel is provided with an inclined surface 30 terminating in a seating groove 31 at its upper end. This structure is herein shown in the form of a strap supported in said relation by the leg 32 at its rear end and the forward extending portion 33 at its forward end, the angular end 34 of the leg 32 being riveted or otherwise secured as at 35 and the forward extension 33 being riveted or otherwise secured as at 36 to the lower portion 16 of the channel track structure. If desired, such seat or socket and inclined face or surface may be formed from the side wall portion 14 of the channel or may be formed as a bracket and suitably secured to the side wall, these being obvious mechanical equivalents of the structure illustrated.

In a like manner but to a lesser degree, so far as height and length are concerned, there is provided near the forward end of each track structure the inclined surface 40 having the seat 41 adjacent its upper end supported by the leg 42 terminating in the angular portion 44 riveted to the lower channel portion 16 as at 45. The forward end 43 of the strap structure 40 is riveted as at 46 to the lower flange portion 16 of the track forming channel. This inclined surface and seat may, if desired, be otherwise formed as previously set forth.

Depending from the rim 25 of the bottom tray structure or projecting laterally outwardly from the side walls 24 near the rear end, are the abutments 50. In the present instance the abutment 50 is integral with the tray structure and is integral with both the rim and the side wall. Near the forward end of the bottom tray structure, there is provided at each side a similar abutment or boss 51 which is similarly supported. The abutments 50 and 51 are of similar character and have rounded lower faces, as indicated at 50*a* and 51*a*, respectively, for a purpose hereinafter to be set forth. These bosses or abutments are of dissimilar length, the dissimilarity being in direct opposition to the dissimilarity in height of the seats 31 and 41, respectively. Thus, the boss 50 is arranged for operative association with the seat 31 and the boss 51 is arranged for operative association with the seat 41, as shown by the full lines in Fig. 3, and when in this association the bottom part of the tray structure is covered by the cover or top part of the tray structure.

As appears more fully in Fig. 1, while the trays are in superposed relation, it will be noted that the cover portion is of lesser width than the bottom portion of the tray structure. Also as appears more fully in this figure, the upper portions 15 of the opposed track channel structure are of greater width than the bottom portions 16 thereof. Thus, the portions 15 of the track structure serve as a support for the cover portion of the tray structure and also serve as a part of the covering arrangement for the bottom or lower portion of the tray structure.

It will be obvious—see Fig. 1—that the cover or upper tray structure may be inverted and if relatively narrow and the side walls are sufficiently inclined, then the cover portion when inverted, will partially nest in the lower tray structure, being supported by side wall engagement with the upper track structure 15 or by the rim portion 19 resting upon the upper portion 15 of the track structure, depending upon the dimensions of the respective parts. Such nesting arrangement, however, is only possible if the height of the articles in the lower tray structure permits the same.

In the event of accidental defrosting of a considerable character, such as may occur, for example, with an electrical refrigerator when the power is accidentally disconnected or there is a failure of the automatic switch, the frozen condensate falls from the refrigerating unit into the shallow tray arrangement formed by the rim 22 on the upper or cover portion of the tray structure. Upon melting, it overflows and then passes down the sides 20 of the upper tray structure, through the openings 17 and collects in the interior of the lower tray structure.

The lower tray structure upon its inner lower face, is provided with the rib arrangement 39 as shown. If the amount of condensate so collected discharges by overflowing from the upper chamber formed by the rim 22, the condensate will collect in the spaces below the tops of the ribs 39 upon which rest the articles in the tray structure. In the event there is considerable condensate thus accidentally discharged, the contents of the tray are exposed to the same. However, the contents of the remainder of the refrigerator in both of the foregoing instances are protected from the condensate, whether it be accidentally or intentionally discharged from the refrigerating unit.

It is the experience with mechanical refrigerators that there is during operation an occasional sloughing off due to vibration, or the like, from the refrigerating unit of a small amount of frozen condensate. This collects in the chamber

formed by the rim structure **22** and should it subsequently overflow therefrom, it is discharged through the openings **17** into the lower portion of the lower tray structure below the level of the top of the ribs **39**, thus substantially preventing any contamination of the articles within the tray structure and thereby also preventing contamination of the refrigerator contents beneath the refrigerating unit.

One of the main features and objectives of the invention is illustrated by the dotted lines in Fig. 3. This shows the lower tray portion or bottom of the tray structure extended and dropped, as it were, relative to the top or cover portion. That movement, however, is limited by the engagement of the boss **50** with the back edge of leg **42**. Thus, accidental dropping of the tray bottom is prevented. Of course, if it is desired to fully disassociate the bottom from the top of the tray structure, the bottom structure would be slightly elevated from the position shown by the dotted lines in Fig. 3 and would be forcibly lifted as it was being moved to the right so that the abutment or boss **50** would clear the top of the seat structure **41**.

One advantage of the present invention is that the lower part or bottom portion of the tray structure may be readily unseated from the full line position shown in Fig. 3 and drawn forwardly for separation, which is of a partial character, to the degree desired. In this separating movement the boss or lug **50** bears on the inclined surface **30** and in the initial part of the movement, the boss or lug **51** bears on the inclined surface **40**. Immediately following disengagement of this last mentioned engagement, the lower portion of the tray structure may be dropped and the same pivots, as it were, on the forward seat, the rim **25** bearing thereon providing the back portion of the rim **25** does not engage the underface of the track portion **15**.

When the bottom tray portion has been sufficiently extended and dropped, articles having a height greater than the depth of the bottom tray portion may be inserted therein and then the bottom tray portion may be repositioned in registering relation as shown by the full lines in Fig. 3. When thus positioned, the articles of a height greater than the depth of the bottom tray portion but of a lesser over-all height than that of the tray structure, are enclosed by the tray structure.

To limit overrunning movement, as it were, in the seating direction—see Fig. 3—stop means is provided. This includes a depending member **60**, carried by the rear cross member **13** and the same is engaged by the rim **25** of the lower tray structure. It will be apparent that the initial opening movement is upwardly if the inclined surface and associated seats are of rigid character. If they are of resilient character no upward movement is necessary to free the abutments from the seats. After the abutments are freed from the seats, the movement is forward toward the left in Fig. 3 and downward and outward movement may be continued as long as the abutment **51** clears the surface **40**.

The curved formations **50***a* and **51***a* are provided on the abutments to facilitate the entrance into and egress from the respective seats. In the event the seats and inclined surfaces are not of resilient character or resiliently mounted to attain the same effect, the abutments **50** and **51** may be of relatively resilient character so as to provide for the same function. Whenever the resilient arrangement is not employed and when the cover and bottom of the tray are in superposed relation, there is a gap between the same in addition to the thickness of the portions **15** and at least equal to the depth of the sockets. This in refrigerator practice may be a highly desirable arrangement for providing restricted ventilation. Whenever restricted ventilation is not desired, however, the aforesaid resilient arrangement previously described should be employed or an equivalent compensation provided.

The complete disconnection arrangement has been previously described. The normal operation engagement of the abutment **50** with the leg **42** for preventing accidental complete disengagement has also been described.

From the foregoing it will be quite apparent that in the normal usage of the device but one hand is required to engage the handle portion **27** for tray bottom manipulation and the other hand is free to remove articles from the tray or to place articles into the tray.

It also will be apparent that the inclined faces and associated seats instead of being supported by the track structure may be supported by the lower tray structure but would be of reverse character and in that event, the track structure would be provided with suitable cooperating abutments instead of the tray structure, as illustrated herein and previously described.

While the invention has been illustrated and described in great detail in the drawing and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. The combination with a slidable tray and a pair of tray support spaced tracks at the sides thereof, of a plurality of spaced elevating surface providing portions upon each track and projecting toward the adjacent tray side, and a similar number and similarly spaced means projecting from each tray side and toward the adjacent track for surface engagement.

2. The combination with a slidable tray and a pair of tray support spaced tracks at the sides thereof, of a plurality of spaced elevating surface providing portions upon each track and projecting toward the adjacent tray side, and means projecting therefrom toward the track for surface engagement, each elevating surface portion terminating at its upper end in a seat for seating the tray projecting means.

3. The combination with a slidable tray and a pair of tray support spaced tracks at the sides thereof, of a plurality of spaced elevating surface providing portions upon each track and projecting toward the adjacent tray side, and means projecting therefrom toward the track for surface engagement, the elevating surface providing portions upon opposed tracks being oppositely aligned, the foremost aligned surfaces being of less length and of less height with reference to a common plane than the next pair of aligned surfaces.

4. The combination with a slidable tray and a pair of tray support spaced tracks at the sides thereof, of a plurality of spaced elevating surface providing portions upon each track and

projecting toward the adjacent tray side, and means projecting therefrom toward the adjacent track for surface engagement, the elevating surface providing portions upon opposite tracks being oppositely aligned, the foremost aligned surfaces being of less length and of less height with reference to a common plane than the next pair of aligned surfaces, each elevating surface portion terminating at its upper end in a seat for seating the tray side projecting means.

5. A one-hand operable covered tray structure for refrigerators and the like, including an inverted dished cover of rectangular outline having pairs of opposite walls, a pair of spaced track means adapted for support by a refrigerator and arranged for cover support, and a tray type bottom of rectangular outline and having similar pairs of opposite walls and including a forward hand engageable portion for bottom movement and suspendingly supported by the track means, at least one opposite pair of cover walls being spaced apart at a lesser distance than the corresponding positioned bottom opposite walls, the track means being arranged to direct liquid discharged from the cover exterior to the bottom interior.

6. A one-hand operable, covered tray structure including a pair of spaced track means, each having an upper support portion and a lower support portion in close proximity thereto, said track means being adapted for support by a refrigerator, said tray structure including a tray type bottom and an inverted upward dished cover of appreciable height, the cover being adapted for resting upon the track means upper support portion and adapted to completely cover the bottom when the latter fully registers therebeneath, the tray type bottom including a forward hand engageable portion for bottom movement when pushed or pulled, the tray and bottom with the track means forming a single compartment of height appreciably greater than the depth of either cover or tray, and cooperating means upon the lower portion of the track means and the tray bottom for suspendingly supporting the latter beneath the cover, said means spacing said bottom slightly apart from said cover for the purpose described.

7. A structure as defined by claim 6 wherein the cover and the tray bottom each are capable of slidable movement upon the track means, and a single track carried stop means arranged to limit the rearward movement of either compartment element upon the track means.

8. A structure as defined by claim 6 wherein the cover and tray bottom are of substantially similar outline, the cover having a pair of spaced sidewalls positioned at an appreciably different distance than the corresponding sidewalls of the tray bottom, the track means being arranged to bridge the spacing between adjacent superposed sidewalls.

9. A structure as defined by claim 6 wherein the cover and tray bottom are of substantially similar outline, the cover having a pair of spaced sidewalls positioned at an appreciably different distance than the corresponding sidewalls of the tray bottom, the track means being arranged to bridge the spacing between adjacent superposed sidewalls, the cover having an upper face defined by a peripheral wall registering rim arrangement, and being of lesser area than the tray bottom for tray bottom collection of overflow from the cover rim defined arrangement.

10. A one-hand operable covered tray structure for refrigerators and the like, including a cover, a pair of spaced track means arranged for support, tray support means near the frant and rear of said track means, a tray type bottom including a forward hand engageable portion for causing bottom movement, said bottom being positioned between said track means and suspendingly supported thereby and removable thereon, forward and rear means at each side of said bottom and cooperating with the track means as well as the front and rear support means upon said track means, the cooperating support means upon said track means and said bottom permitting limited forward movement together with slight tilting movement of said bottom relative to said track means in the initial portion of the bottom forward movement, and limiting the extent of said forward movement to prevent accidental separation of the bottom and the track means, said cooperating means permitting increased tilting of the bottom relative to the track means in the final forward non-separating movement of the bottom relative to the track means, the last mentioned tilting movement being greatest in amount relative to the first mentioned tilting movement.

11. A one-hand operable covered tray structure for refrigerators and the like, including a cover, a pair of spaced track means arranged for support by a refrigerator and adapted for cover support, tray support means near the front and rear of said track means, a tray type bottom including a forward hand engageable portion for causing bottom movement, said bottom being positioned between said track means and suspendingly supported thereby and movable thereon, forward and rear means at each side of said bottom and cooperating with the track means as well as the front and rear support means upon said track means, the cooperating support means upon said track means and said bottom permitting limited forward movement together with slight tilting movement of said bottom relative to said track means in the initial portion of the bottom forward movement, and limiting the extent of said forward movement to prevent accidental separation of the bottom and the track means, said forward track supported means and said rearward tray supported means having cooperative relationship whereby the bottom may be elevated to eliminate the stopping effect and permit intentional complete separation of the bottom and track means.

12. A one-hand operable covered tray structure for refrigerators and the like, including a cover, a pair of spaced track means arranged for support by a refrigerator and adapted for cover support, tray support means near the front and rear of said track means, a tray type bottom including a forward hand engageable portion for causing bottom movement, said bottom being positioned between said track means and suspendingly supported and movable thereon, forward and rear means at each side of said bottom and cooperating with the track means as well as the front and rear support means upon said track means, the cooperating support means upon said track means and said bottom permitting limited forward movement together with slight tilting movement of said bottom relative to said track means in the initial portion of the bottom forward movement, and limiting the extent of said forward movement to prevent accidental separation of the bottom and the track means, said forward track supported means and said rear-

ward tray supported means having cooperative relationship whereby the bottom may be elevated to eliminate the stopping effect and permit intentional complete separation of the bottom and track means, said cooperating means permitting increased tilting of the bottom relative to the track means in the final forward non-separating movement of the bottom relative to the track means, the last mentioned tilting movement being greatest in amount relative to the first mentioned tilting movement.

13. A one-hand operable, covered tray structure for refrigerators and the like including a pair of spaced track means adapted for support by a refrigerator, said tray structure including a tray type bottom having a forwardly directed, hand engageable portion for bottom movement when pushed or pulled, means carried by the bottom for the suspension support of the bottom by said track means, a cover for the tray bottom adapted to rest upon the track means and completely cover the bottom when the latter fully registers therebeneath, and cooperating means so positioned upon the track means for bottom means engagement for normally limiting forward movement of the bottom when the latter is pulled forwardly and preventing accidental separation between the bottom and track means but permitting intentional separation when desired.

14. In combination a refrigerator shelf comprising a frame, having spaced apart grid portions and an opening therebetween, a pair of tracks arranged one at each side of the opening, and a tray structure including a cover and a bottom portion, each track including an upper cover support portion upon which the cover is adapted to rest and a lower support portion suspendingly supporting the bottom beneath the track supported cover and between the tracks, and cooperating means upon the lower support portions and the bottom for modifying longitudinal sliding movement of the bottom relative to the tracks.

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