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ANTITILT AND STOP MEANS FOR SLIDING SHELVES

Filed Dec. 23, 1944

2 Sheets-Sheet 1

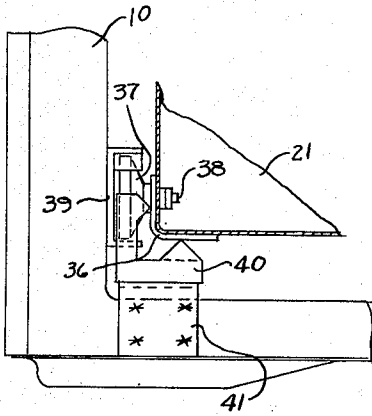


Fig. 7

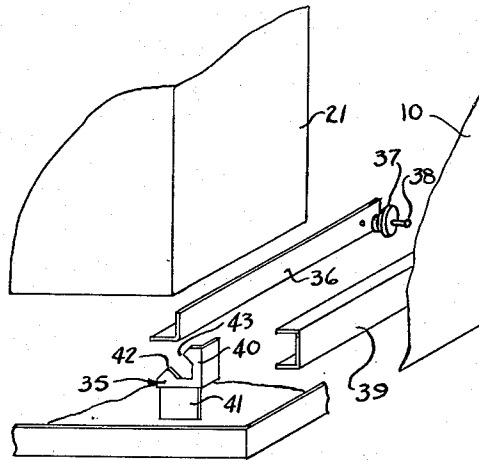


Fig. 8

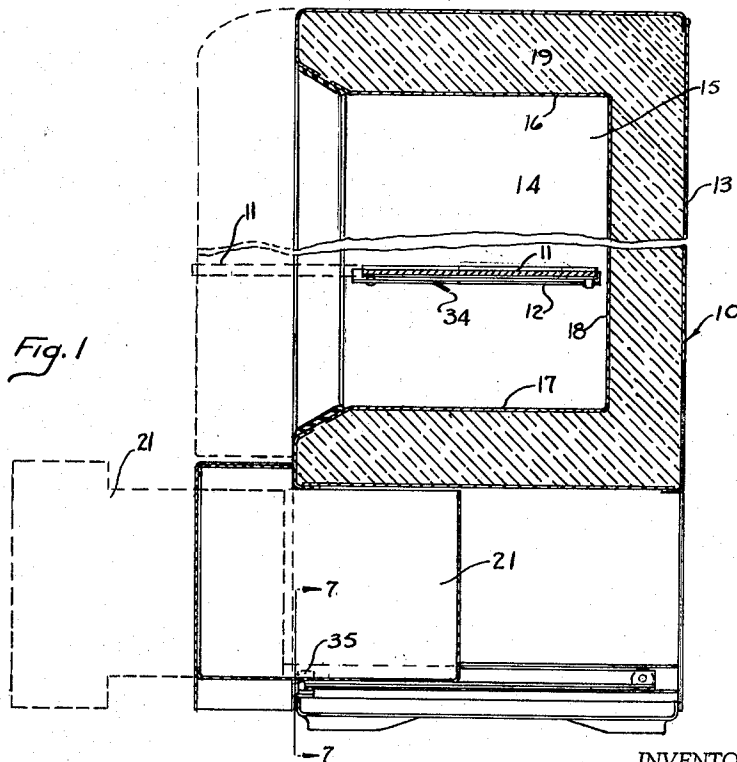


Fig. 1

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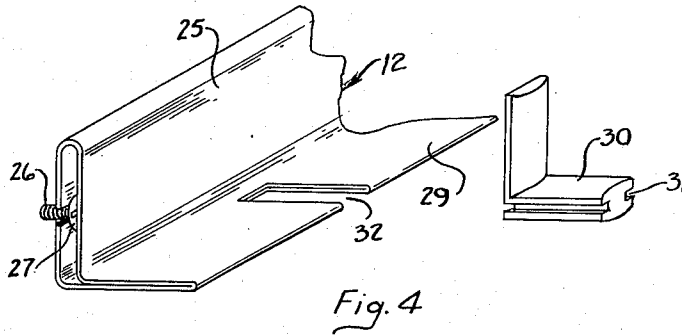


Fig. 4

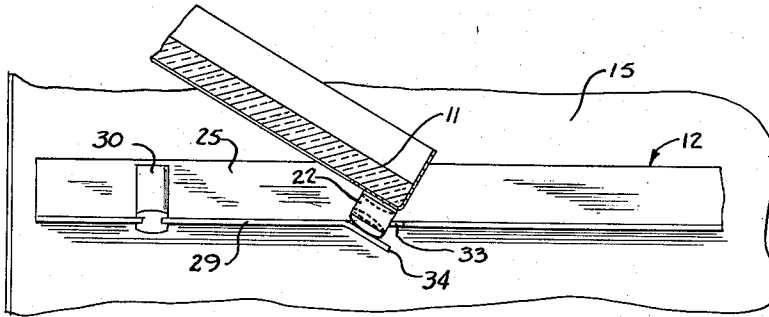


Fig. 3

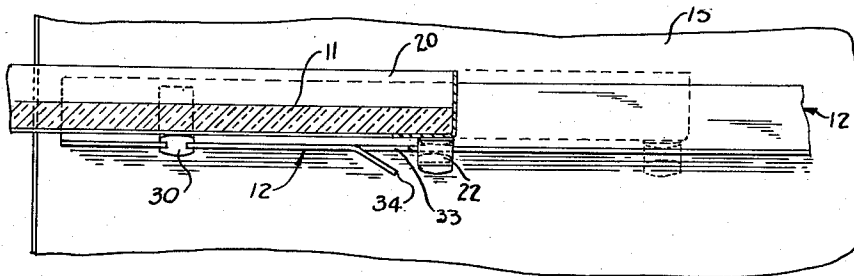


Fig. 2

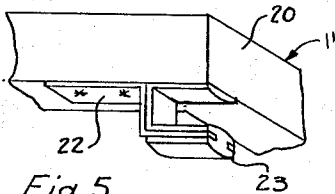


Fig. 5

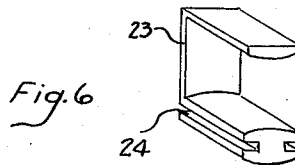


Fig. 6

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ANTITILT AND STOP MEANS FOR SLIDING
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a corporation of Michigan

Application December 23, 1944; Serial No. 569,453

6 Claims. (Cl. 312-348)

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This invention relates to refrigerator cabinets and more particularly to sliding shelves and shelf guides therefor.

The principal object of the present invention is to provide a novel form of shelf guide for a sliding shelf which prevents accidental removal of the shelf but permits ready removal thereof when desired.

A further object of the invention is to provide a shelf guide having novel means thereon for minimizing friction between the shelf and guide.

Another object is to provide a novel anti-friction element for supporting a shelf or drawer and for limiting lateral movement thereof.

These objects will more fully appear in the following specification when read in connection with the accompanying drawings, wherein—

Figure 1 is a vertical cross-sectional view of a refrigerator cabinet embodying the invention;

Figure 2 is a fragmentary cross-sectional view on an enlarged scale illustrating the shelf and its guide;

Figure 3 is a fragmentary cross-sectional view similar to Figure 2 showing the shelf in tilted position ready for removal;

Figure 4 is an exploded pictorial view showing one form of anti-friction element and its manner of attachment to the shelf guide;

Figure 5 is a fragmentary pictorial view of one of the rear corners of the shelf showing the under side thereof;

Figure 6 is a pictorial view of the anti-friction element employed on the shelf;

Figure 7 is a fragmentary cross-sectional view taken on substantially the line 7-7 of Figure 1; and

Figure 8 is an exploded pictorial view of the structure shown in Figure 7.

The drawings illustrate a refrigerator cabinet 10 having a sliding shelf 11 slidably mounted on a pair of longitudinally extending guides 12, and a sliding drawer 21. The shelf is mounted on anti-friction elements on the guides in a manner to prevent accidental dislodgment of the shelf but to permit ready removal of the shelf for cleaning, as will more fully appear presently. The drawer 21 is also mounted on novel anti-friction elements.

The refrigerator cabinet is of substantially conventional design. It includes an outer casing 13 and a liner 14 located within the outer casing and spaced therefrom. The liner forms a refrigerated compartment. The liner is composed of oppositely disposed upright side walls 15, top and bottom walls 16 and 17 respectively, and a rear wall 18. Insulation 19 is placed between the

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outer casing and the liner to minimize heat transfer.

Any convenient number of shelves may be utilized within the liner 14 for the convenient storage of food. Only one shelf 11 is shown.

The shelf herein shown preferably is formed of a sheet of glass, although it will be evident that shelves of wire or other material may be utilized as well. Shelf 11 is bound around its edges by a metallic frame 20 formed of members of angular configuration. On the under side of the shelf at the two rear corners thereof a pair of abutments 22 are attached. The abutments 22 are of generally Z-shaped cross-section with one leg attached to the frame 20 and the other leg spaced below the frame and extending laterally outwardly from the shelf. The abutments 22 are adapted to engage the guides 12 as will appear presently. The abutments depend from the under side of the shelf.

As an aid in minimizing friction between the shelf and its guides the abutments 22 are lined with U-shaped anti-friction elements 23 (see Figures 5 and 6). The elements 23 may be formed of one of the harder plastic materials, if desired. The lower leg of the element 23 has two parallel slots 24 therein. The lower leg of the abutment 22 is bifurcated to provide a notch into which the lower leg of the element 23 fits. The bifurcations fit into the slots 24 in the anti-friction element 23. Preferably all three interior surfaces of the U-shaped element 23 are slightly curved as indicated in Figure 6.

The two guides 12 for the shelf are identical and only one will be described. Each guide 12 is of generally L-shaped cross-section, having legs 25 and 29. The upright leg 25 is hollow, as indicated best in Figure 4, and its outer wall is provided with a continuous longitudinally extending slot 26. (See Figure 4.) Screws or similar fasteners 27 are inserted through the slot 26 with the heads thereof within the hollow leg 25. The fasteners are received in openings in the upright side 15 of the liner and held in place by suitable nuts which may be of the quick acting sheet metal type. The fastening screws 27 can be adjusted longitudinally of the guide in order to fit into the holes in the wall 15 of the liner. The inner wall of the leg 25 is imperforate so that the fastening means 27 will be completely concealed when the guide 12 is in place.

The horizontal leg 29 of the guide is provided adjacent its front end with an anti-friction element 30 (see Figure 3). The element 30 is similar to element 23 previously described, but is of

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L-shaped instead of U-shaped configuration. The horizontal leg of element 30 is provided with slots 31 which receive the sides of a notch 32 in the lower leg 29 of the guide. The side walls of the slots 31 overlie the top and bottom surfaces of the leg 29.

Some distance rearwardly of the front end of the guide is an opening 33. The opening 33 is formed by partially severing and bending the metal of the leg 29 to form an abutment 34. The abutment 34 is inclined downwardly and rearwardly as shown in Figures 2 and 3. The longitudinal dimension of the opening 33 is preferably slightly less than the corresponding dimension of the abutment 22 on the shelf but is greater than the thickness of the lower leg of the abutment 22 with its anti-friction element 23.

When in place, the shelf 11 rests upon the lower legs 29 of the guides 12 with the U-shaped abutments 22 embracing said legs. This position of the shelf is shown in Figures 1 and 2. With this arrangement the only points of contact between the guide and shelf are the adjoining surfaces of the anti-friction elements 23 and 30. Thus, the shelf can be moved forwardly and rearwardly with little effort.

The shelf can be moved forwardly from its position within the cabinet shown in Figure 1 until the abutment 22 strikes the inclined abutment 34. This latter position is shown in dotted lines in Figure 1. Any articles of food on the shelf are thus readily accessible. The shelf cannot be accidentally dislodged while it is in this position, however, because when the abutments 22 and 34 are in contact, the rear edge of the abutment 22 still underlies the horizontal portion of the guide directly in the rear of the notch 33. However, if it is desired to remove the shelf for cleaning, that is readily effected by lifting the forward edge of the shelf to an inclined position, as shown in Figure 3, and pulling the shelf from the guides. As will be evident in Figure 3, the size of the opening 33 is greater than the thickness of abutment 22 so that when the shelf is tilted, the abutment 22 readily moves through the notch 33. The shelf is replaced as quickly as it is removed by reversing the procedure previously described.

It will be noted that the anti-friction elements 23 and 30 are constructed so that they not only provide vertical support for the shelf but prevent undue lateral movement. In other words the under sides of the upper legs of the elements 22 rest upon the horizontal legs of guides 12 while the shelf rests upon the upper surfaces of the horizontal legs of the elements 30 to provide the vertical support for the shelf. The inner surfaces of the vertical portions of elements 23 engage the adjacent edges of guides 12 while the inner surfaces of the vertical portions of elements 30 engage the adjacent edges of the shelf 11, thereby limiting lateral movement of the shelf.

Anti-friction elements 35 similar to elements 30 are also employed to support the sliding drawer 21 in the bottom of the refrigerator cabinet 10. They provide both vertical and lateral support for the drawer.

The drawer 21 may be of any suitable construction. Preferably it is of rectangular box shape and is formed by sheet metal. It is of relatively large size and when fully loaded may be quite heavy. Hence the need to reduce the friction between the drawer and its guides is quite apparent.

The drawer 21 is supported by a combination

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of rollers and anti-friction elements having sliding contact with the drawer. A pair of angle members 36 are rigidly fastened to the lower longitudinal edges of the drawer 21. The angle members 36 are considerably longer than the drawer and extend rearwardly thereof. A pair of rollers 37 are attached to the upright flanges of the angle members 36 by pins 38 adjacent the rear ends of the members 36. The rollers revolve freely on the pins 38.

A pair of channels 39 are securely attached to the inside of the cabinet parallel to the angle members 36. The flanges of the channels 39 are located adjacent, but spaced from, the sides of the drawer 21 and receive the rollers 37 between them. (See Figure 7.)

At the front of the cabinet and substantially aligned with the channels 39 are the two anti-friction elements 35. The anti-friction elements 35 are plastic blocks 40 secured to metallic brackets 41. The brackets 41 are of angular cross section and preferably are welded to the front of the base of the cabinet.

Each plastic block 40 is cut away to provide an upwardly extending knife edge 42 and a laterally extending knife edge 43. These knife edges engage the bottom and side flanges of the angle member 36 which is attached to the drawer.

When the drawer 21 is moved in and out, the forward portion of the drawer and the attached angle member slide on the knife edges 42 and 43 while roller 37 moves within the channel 39. The cooperation of the roller and channel prevents the drawer from tipping forward when the drawer is pulled well out. The knife edges provide support for the drawer and limit the lateral movement thereof.

From the foregoing it will be apparent that the present invention provides a novel shelf guide which permits ready removal of the shelf when desired, but absolutely prevents accidental dislodgment of the shelf when it is pulled to its forwardmost position. The shelf guides are very simply fabricated and easily attached to the walls of the refrigerator, and are distinctly ornamental when in place because no fastening means whatever are visible. Also the novel form of anti-friction element permits easy movement of the shelf while guiding the same in its longitudinal movement.

The scope of the invention is indicated in the appended claims.

I claim:

1. A cabinet having a storage chamber therein defined in part by oppositely disposed upright side walls, a pair of oppositely disposed elongated horizontal shelf guides mounted on said walls, a shelf slidably mounted on said guides for forward and rearward movement, and means for limiting said forward movement comprising a downwardly and rearwardly inclined abutment on each guide and a cooperating abutment depending from each side of said shelf, said last named abutments having horizontal legs extending beneath the adjacent guides, said guides having laterally inwardly opening notches therein directly above the abutments on the guides to permit removal therethrough of the abutments on the shelf.

2. In a cabinet having an upright side wall, means in said cabinet for slidably supporting a shelf, said means comprising an L-shaped guide attached to said side wall and a generally L-shaped anti-friction element secured to said guide, said anti-friction element being attached

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to said shelf guide by interlocking engagement therewith.

3. A cabinet having a storage chamber therein defined in part by oppositely disposed upright side walls, a pair of oppositely disposed elongated horizontal shelf guides mounted on said walls, a shelf slidably mounted on said guides for forward and rearward movement, and means for limiting the forward movement of said shelf comprising an abutment depending from each guide and a cooperating abutment depending from each side of said shelf and extending beneath the adjacent guides, each of said guides having an opening therein rearwardly of and closely adjacent to the abutment thereon to permit removal therethrough of the abutments on the shelf, the longitudinal dimensions of the openings in the guides being less than the corresponding dimensions of the abutments on the shelf and greater than the vertical dimensions of the last named abutments.

4. A cabinet having a storage chamber therein defined in part by oppositely disposed upright side walls, a pair of oppositely disposed elongated horizontal shelf guides mounted on said walls, a shelf slidably mounted on said guides for forward and rearward movement, and means for limiting the forward movement of said shelf comprising an abutment depending from each guide and a cooperating abutment depending from each side of said shelf and extending beneath the adjacent guide, each of said guides having an opening therein rearwardly of and closely adjacent to the abutment thereon to permit removal therethrough of the abutments on the shelf, the rearward surfaces of the abutments on the guides being inclined rearwardly and downwardly from said guides and being located below the respective openings in the guides.

5. A cabinet having a storage chamber therein defined in part by oppositely disposed upright

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side walls, a pair of oppositely disposed elongated horizontal shelf guides mounted on said walls, each of said guides comprising a horizontal flange projecting laterally from the associated wall, a shelf slidably mounted on said flanges for forward and rearward movement, and means for limiting the forward movement of said shelf comprising an abutment depending from each guide and a cooperating abutment depending from each side of said shelf and extending beneath the flange adjacent thereto, each of the abutments on said flanges having downwardly and rearwardly inclined rear surfaces, each of said flanges having a notch therein opening toward the opposite wall of the chamber and located closely adjacent to the abutment on the respective flange, the inclined surface of each abutment underlying the portion of the notch in the respective flange.

6. A cabinet as defined in claim 5 wherein the longitudinal dimensions of the notches in the guides are less than the corresponding dimensions of the abutments on the shelf and greater than the vertical dimensions of said last named abutments.

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