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SHELF AND SHELF SUPPORT STRUCTURE

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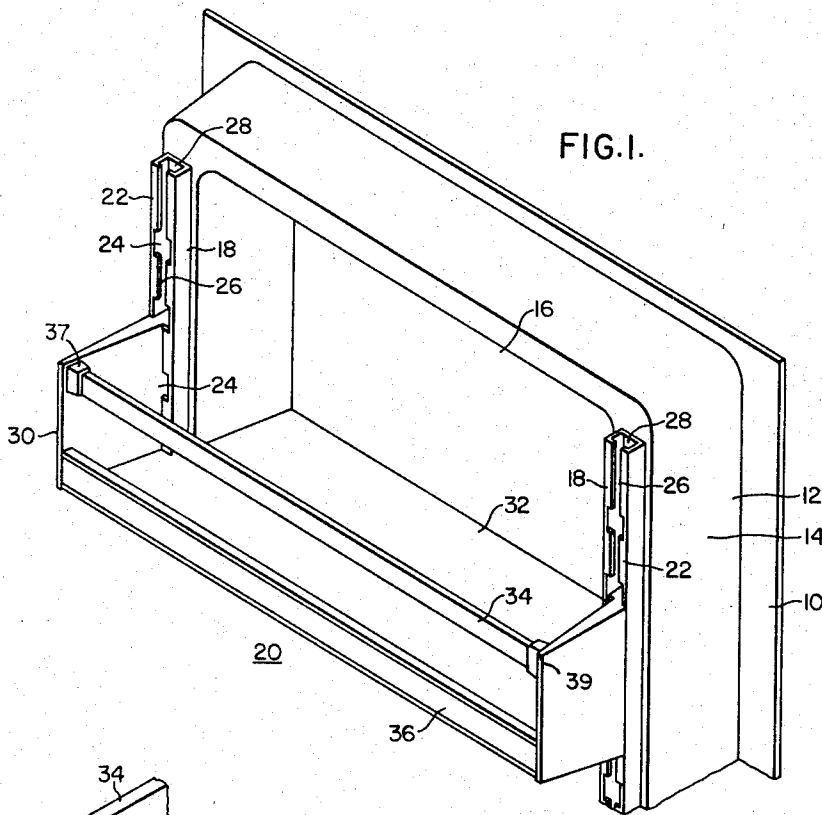


FIG. 1.

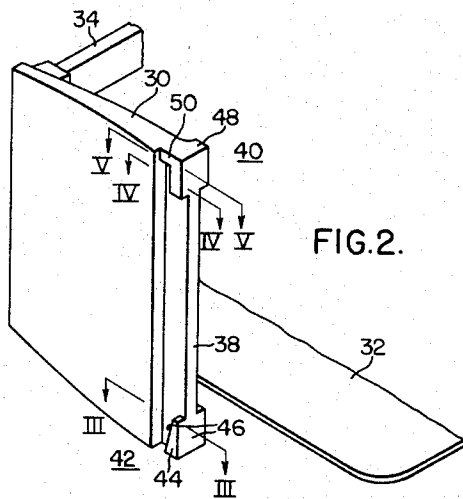


FIG. 2.

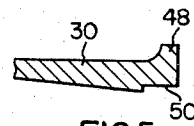


FIG. 5.

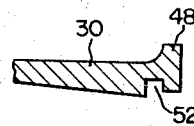


FIG. 4.

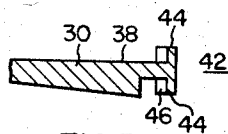


FIG. 3.

WITNESSES

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SHELF AND SHELF SUPPORT STRUCTURE

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5 Claims. (Cl. 211-176)

This invention relates to an improved shelf and shelf support structure, particularly applicable to refrigerator door shelves.

An object of the invention is the provision of a shelf structure arranged for ease of installation and vertical adjustment, which resists accidental displacement, which may be adjusted without total removal of the shelf from the support structure, which seats firmly when positioned, and which lends itself to modern styling.

The general structural arrangement, in accordance with the invention includes a pair of upright stringers secured to the inner panel of a refrigerator door, for example. The stringers are preferably of channel shape which thus provide interior vertical trackways. Each stringer has a front face with vertically spaced, expanded-width notches and a narrow vertical slot traversing a substantial number of the notches. The supported shelf includes a pair of mounting bracket means laterally spaced from each other to register with the stringer trackways. Each bracket includes lower lug means contoured to slide freely in a vertical direction in the trackway and removable forwardly from the trackway at any notch location. Each bracket further includes upper lug means contoured to interlock with the lower edge of any notch and seat thereon to prevent downward and forward movement of the upper lug means relative to the stringer. The shelf is installed by positioning the lower lug means through the notches and into the trackway, and then lowering the shelf slightly until the upper lug seat upon the lower edge of the notch in which the upper lug means has been inserted. The shelf may be readily adjusted vertically along the stringers by simply lifting the shelf slightly and tilting it forwardly to release the upper lug means from their notch seats, and then raising or lowering the shelf with the lower lug means following the trackway until the new position is reached. The upper lug means are then again seated in the notches.

The described arrangement after shelf adjustment to be made without removing the articles supported by the shelf. The arrangement is also such that if the shelf is accidentally displaced upwardly, the shelf tends to reset itself. Even if the upper lug means come out of the notches, the lower lug means tend to prevent the shelf from a free fall by riding down the trackways until the lower lug means bind in the trackways and stop the fall.

The invention will be described in more detail in connection with the accompanying drawing illustrating a preferred embodiment thereof by way of example, and wherein:

FIGURE 1 is a fragmentary isometric view of the inner face of a refrigerator door panel provided with structure according to the invention;

FIG. 2 is a fragmentary isometric view of one end of the shelf;

FIG. 3 is a fragmentary horizontal section corresponding to one taken along the line III-III of FIG. 2;

FIG. 4 is a fragmentary horizontal section corresponding to one taken along the line IV-IV of FIG. 2; and

FIG. 5 is a fragmentary horizontal section corresponding to one taken along the line V-V of FIG. 2.

Referring to FIG. 1, the shelf and shelf support arrangement of the invention is shown carried by the inner face of a refrigerator door 10. The door inner panel 12 shown is molded plastic providing a continuous ridge 14

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along both sides and the top, with a recess 16 encompassed by the ridges. The pair of upright stringers 18 are secured to the crest of the side ridges 14 and in turn support the shelf 20.

Each stringer 18 has the general form of a forwardly open channel provided with a pair of inwardly directed front flanges 22 with the facing edges of the flanges crenelated to provide a series of vertically spaced notches 24 for substantially the height of the stringers. The front face of the stringers is provided with a narrow central slot 26 which extends for the height of the stringer. Each notch 24 provides a potential bearing for the shelf 20, as well as permitting the insertion or removal of those parts of the shelf 20 which cooperate with the stringers to provide the support for the shelf. The interior of the stringers 18 is unobstructed and forms a trackway 28 extending for the height of the stringers. As currently preferred, the stringers are metallic members.

The shelf 20 is a unitary structure which includes a pair of opposite end brackets or end caps 30, a base or floor 32 which is secured along its opposite end edges to the end caps, and upper and lower cross rails 34 and 36, respectively. The ends of the upper cross rail are received in inwardly open sockets 37 on the upper front corners 39 of the end caps 30. The lower cross rail may be formed as an upright flanged part of the shelf floor. Metal is also the currently preferred material for making the shelf.

The rear vertical margin 38 (FIG. 2) of each end cap 30 is provided with the means which interlock with the stringer structure to support the shelf. Upper lug means 40 and lower lug means 42 on the rear margin 38 engage with the stringers 18 when the shelf is seated. As shown in FIGS. 2 and 3, the lower lug means 42 comprise a pair of oppositely directed ears 44 projecting laterally from both of the side faces of the relatively narrow thickness rear margin 38. Each ear somewhat resembles a teardrop as viewed from the end of the shelf with the front face 46 of the ear being inclined rearwardly slightly, this shape facilitating vertical movement of the shelf relative to the stringer when only the lower lug means 42 are disposed within the trackways.

The upper lug means 40 (FIGS. 2, 4 and 5) also include a pair of outwardly directed ears which are received within the trackways 28 when the shelf is seated. While the inner ear portion 48 is of uniform cross section for its height, the outer ear portion includes an abutment or shoulder 50 which bridges the gap or short vertical channel 52 between the outer ear portion and the finished end face of the end caps 30. Thus, as perhaps best shown in FIG. 2, the outer ear portion of the upper lug 40 has a generally right angle shape, with the shoulder 50 serving as the stop means which prevents the shelf from sliding downwardly freely in the trackway when the shelf is interlocked with the stringers 18.

To install the shelf on the stringers, the lower lug means 42 are first inserted in any notch 24. The shelf is then slid up or down to the desired height. The upper lug means 40 is then moved into a seating position in the notch next above the notch with which the lower lug means 42 register by lowering the shelf slightly until the shoulders 50 of the upper lug means rests on the lower side of the particular notch 24.

With the currently preferred construction, the upper and lower lug means are spaced apart twice the distance as the spacing between adjacent notches in the stringer. Accordingly, either the upper or lower lug means may be inserted in the respective notch before the other lug means. It will be appreciated however that the spacing between the lug means need not be the same as the spacing between notches.

When the shelf is in its supported position, both of the ears 44 of the lower lug means 42 are disposed behind

the front flanges 22 immediately below a notch, and the ears of the upper lug means are likewise disposed immediately behind the front flanges 22 just below the next higher notch. The shoulder 50 rests on a ledge of the flange 22 defining the lower edge of a notch.

It will be noted that the floor 32 (FIGS. 1 and 2) of the shelf structure projects substantially behind the vertical rear edge of the end caps so that the lug means are generally centered with respect to the front-to-rear dimension of the floor 32. Accordingly, with articles placed on the rearwardly projecting part of the floor 32, the stability of the shelf structure is promoted in case the shelf is accidentally jarred upwardly, since the downward movement provided by the articles will tend to keep the upper lug means 40 in the trackway. However even with the shelf unloaded if the shelf structure is accidentally jarred upwardly with the upper lug means 40 moving forwardly out of a notch, the shelf may slide down only part way since the forward motion of the top portion of the shelf tends to cause the lower lug means to bind in the trackway.

An additional feature of the shelf and support structure is that with the shelf loaded it may be readily adjusted to different heights by tilting the shelf forwardly at the top and moving it up or down without removing the loading articles. Then when the desired location of the shelf is reached, the upper lug means are again simply moved rearwardly into a seated position. The arrangement is also such that the shelf can not be installed in an out-of-level or cocked position. The design of the lug means as integral parts of the end caps, with the outer face of the end caps offset outwardly essentially hides the lug means from view and provides a pleasing appearance.

While the invention has been described in its currently preferred construction, it will be appreciated that certain modifications may be made without departing from the spirit thereof. For example, while not considered preferable, each stringer could be other than channel shaped in cross-section and could be provided with a notched flange along one edge only, with such a construction, the lengthwise dimension of the shelf must be held sufficiently closely to insure that the lug means can not slip off the seats provided by the notches.

I claim as my invention:

1. A shelf and shelf support construction, comprising: a pair of upright stringers, each having an interior vertical trackway and presenting a front face with vertically spaced, expanded-width notches, and a vertical slot narrower than said notches traversing a substantial number of said notches;

a shelf adapted to be supported from said stringers, said shelf having a pair of mounting brackets laterally spaced to register with said stringer trackways, each bracket including lower lug means contoured to be slid freely in a vertical direction in said trackway and removable forwardly from said trackway at any notch location;

each bracket further including upper lug means contoured to interlock with the lower edge of any notch to prevent downward and forward movement of said upper lug means relative to said stringer.

2. A construction according to claim 1 wherein: each said stringer comprises a forwardly open channel having a front face in the form of opposite, inwardly directed flanges with crenelated edges forming said notches and said vertical slot.

3. A construction according to claim 2 wherein: said lower lug means comprises a thin portion received in said narrow slot and outwardly directed ears disposed behind said flanges when said shelf is seated, the front face of said ears being rearwardly inclined to facilitate vertical sliding movement of said lower lug means in said trackways when said upper lug means is disposed forwardly of said trackway.

4. A construction according to claim 1 wherein: said shelf brackets comprise the rear vertical margins of end caps for said shelf;

both said upper and lower lug means include T-shaped portions in lateral cross-section with said upper lug means including a shoulder joining the stem and outer bar of said T-shaped portion for seating on a lower boundary of said notch and preventing downward movement of said shelf as installed.

5. A construction according to claim 1 wherein: said brackets support a shelf floor projecting rearwardly a substantial distance from the location of said lug means so that said lug means are substantially centered with respect to the front-to-rear dimensions of said shelf floor.

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