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REFRIGERATOR COMPARTMENT SHELF AND GUARD ASSEMBLY

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FIG. 1

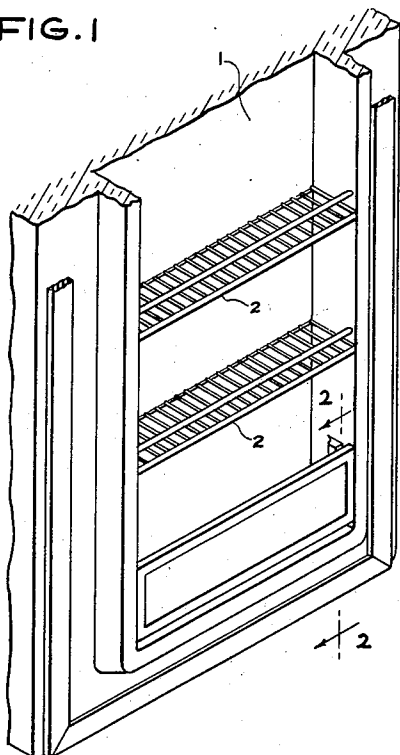


FIG. 2

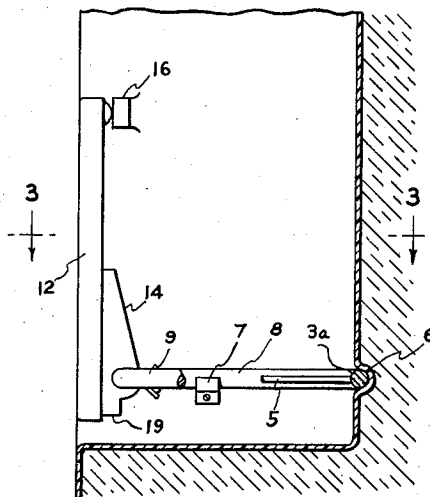


FIG. 4

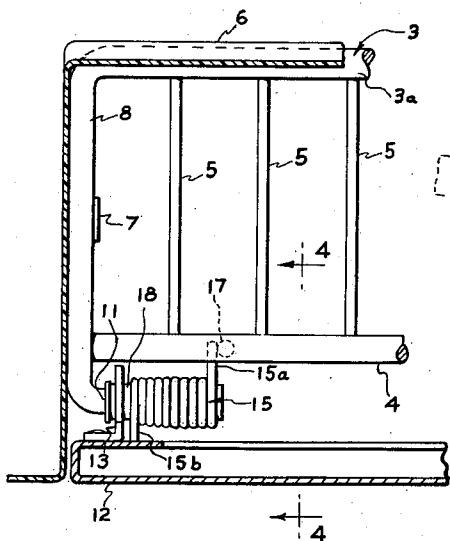
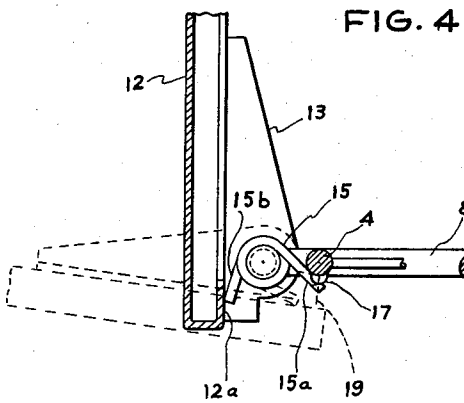


FIG. 3

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**REFRIGERATOR COMPARTMENT SHELF AND GUARD ASSEMBLY**

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4 Claims. (Cl. 312—319)

The present invention relates to a refrigerator compartment shelf and guard assembly and more particularly to a shelf construction incorporating mounting means for a pivotally mounted front guard or door.

Many of the modern refrigerators have a plurality of shelves for the storage of foodstuffs within a recess provided in the door. These shelves must be provided with front guards to prevent the foodstuffs, due to their own inertia, from sliding off the shelves when the door is closed. When foodstuffs which are packed in tall containers, such as pop bottles, milk cartons, fruit and canning jars, etc., are stored upon these shelves, it is necessary to have the front guard as high above the shelf as possible in order to prevent these tall containers from tipping over when the door is closed. If stationary guards are employed, this type of arrangement makes it necessary to provide a substantial amount of space above the shelf and guard in order to allow the tall container to be placed over the top of the guard and onto the shelf. The provision of this space reduces the total amount of space available for the remaining shelves.

It is an object of the present invention to provide an improved shelf and guard mounting structure for a refrigerator door shelf with the guard being movable about a horizontal axis of rotation in order to permit placement of foodstuffs upon the shelf from the front rather than over the top of the guard.

More specifically, it is an object of the present invention to provide an improved shelf and pivoted guard structure for a refrigerator door in which the pivoting means for the guard is an integral part of the shelf.

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

In carrying out the objects of this invention there is provided a shelf adapted to be supported in a recess formed in a refrigerator door and comprising a frame structure including a C-shaped wire member and a cross bar or wire extending across the forward or open end of the C-shaped frame member and secured at its ends to that member. A guard is provided across the front of the shelf and this guard is pivotally supported on the shelf by hinge means comprising inwardly bent end portions of the C-shaped member forming hinge pivots and brackets secured to the guard and pivotally mounted on these inwardly bent end portions. The guard is normally held in a vertical position by a helical spring disposed on the inwardly bent end portions with one end thereof engaging the cross bar and the other end in engagement with a portion of the guard at a point below the plane of the shelf.

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

Fig. 1 is a perspective view of a portion of a refrigerator

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door having a storage recess which contains the shelf and guard construction of the present invention;

Fig. 2 is a cross sectional elevation view taken along line 2—2 of Fig. 1 showing the shelf and guard structure mounted within the storage recess of a refrigerator door;

Fig. 3 is a plan view taken along line 3—3 of Fig. 2 showing the projecting ends of the wire frame shelf having the guard mounting structure thereon; and

Fig. 4 is an elevation view taken along line 4—4 of Fig. 3 with dotted lines showing the guard in the open position and the relationship of the tab and the front edge of the shelf.

Referring now to Fig. 1 there is shown a refrigerator door having upstanding side and end walls forming a recess 1. A plurality of shelves 2 are positioned within the recess for the storage of foodstuffs. In the lower portion of the recess 1 there is positioned a shelf and guard structure which utilizes the mounting means embodied in the present invention. While in the illustrated embodiment of the invention, the shelf and guard structure is shown in the lower portion of the storage recess, this position is not essential to the invention and the shelf and guard structure could be positioned anywhere in the recess.

As can best be seen in Figs. 2, 3, and 4, the shelf comprises a generally C-shaped wire frame member or rod structure 3, having a cross bar or rod 4 positioned across and spaced from the open portion of the C-shaped member and secured at its ends thereof to the C-shaped frame. A plurality of spaced cross wires 5 are welded to the cross bar 4 and to the rear side 3a of the C-shaped frame member to provide support for foodstuffs placed upon the shelf. The shelf is firmly held within the door recess by the cooperating action of an indented portion 6 of the rear wall of the recess and a pair of shelf clamps 7 upon the side walls of the recess. In the present embodiment of the invention these clamps 7 are welded to the ends 8 and 9 of the C-shaped frame and form an integral part of the shelf structure.

The opposite ends 8 and 9 of the C-shaped frame member 3 extend forwardly beyond the cross bar 4 or front edge of the shelf and have inwardly turned end portions 11 at the opposite ends of the shelf which are substantially parallel to the cross bar 4 but spaced therefrom. According to the present invention there is provided a guard mounting means which utilizes these inwardly bent end portions 11 as a pivot or hinge point for rotation of the guard about a horizontal axis. The guard mounting means comprises a pair of brackets 13 and 14 which slide over the inwardly bent end portions 11 and which are connected to the guard 12 adjacent the lower portions thereof. The brackets in cooperation with the inwardly bent end portions 11 provide a hinge or pivot means for rotation of the guard about a horizontal axis.

In order to maintain the guard in an upright or vertical position, helical springs 15 are provided which bias the guard into a normally vertical position against a stop 16 provided on the side wall of the recess. The helical springs 15 are positioned upon the inwardly bent ends 11 with one end 15a of each spring pressing against the cross bar 4 which forms the front edge of the shelf, and the other end 15b of each spring 15 biasing the door into a vertical position through pressure exerted upon a portion 12a of the door extending below the plane of the shelf. As shown in Figs. 3 and 4, a pair of small steel balls 17 welded to the underneath side of the cross bar 4 provide projections engaged by the spring end 15a to maintain the helical springs in position and prevent the springs from sliding off the ends of the inwardly turned end portions 11. In order to provide ease of rotation,

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a pair of sleeves or bushings 18, preferably of nylon, are inserted between the brackets and the inwardly bent end portions 11 about which the brackets rotate during operation of the guard. As can be seen in Fig. 3, the helical springs 15 are also positioned upon the sleeves 18.

To prevent rotation of the guard to a point where the springs 15 are overstressed, a tab or lug 19 is provided which is adapted to strike against the cross bar 4 or front edge of the shelf when the guard is rotated outwardly to horizontal position. While in this position, the guard can be used as a sorting shelf for foodstuffs placed upon the shelf. That is, by placing an article heavy enough to overcome the force of the helical springs upon the guard, it is possible to maintain the guard in a horizontal position and use it as a sorting shelf. In this position the guard is supported by the cooperating action of the tab 19 against the cross bar 4 and the inwardly bent end portions 11.

Thus as can be seen from the above description, the present invention provides a simple and inexpensive guard mounting structure which utilizes integral portions of the wire shelf for mounting the guard and provides a guard which can be rotated outwardly from the recess in order to permit positioning of foodstuffs upon the shelf.

While in accordance with the patent statutes there has been described what at present is considered to be the preferred embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention and it is, therefore, the aim of the appended claims to cover all such changes and 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 a refrigerator door of the type having a recess therein for storage of foodstuffs, a shelf construction comprising a C-shaped wire frame supported within said recess, said frame opening in the direction of said recess opening, a cross bar extending across the forward portion of said frame with the ends thereof attached to said frame, a front guard extending across the front of said recess adjacent the forward portion of said shelf, hinge means for mounting said guard for rotation about a horizontal axis, said hinge means comprising opposed end portions of said C-shaped frame extending forwardly beyond the front of said cross bar and bent inwardly substantially parallel to the front of said cross bar and spaced therefrom to form hinge pivots, brackets pivotally mounted on said inwardly bent ends and attached to said front guard whereby said guard pivots about a horizontal axis through said inwardly bent ends, and helical springs disposed on said inwardly bent ends, said springs having ends reacting respectively against said cross bar and the lower portion of said front guard below the plane of said shelf thereby biasing said guard to a vertical position.

2. In a refrigerator door of the type having a recess therein for storage of foodstuffs, a shelf construction comprising a C-shaped wire frame supported within said recess, said frame opening in the direction of said recess opening, a cross bar extending across the forward portion of said frame with the ends thereof attached to said frame, a normally vertical front guard extending across the front of said recess adjacent the forward portion of said shelf, hinge means for mounting said guard for rotation about a horizontal axis, said hinge means comprising end portions of said C-shaped frame extending forwardly beyond the front of said cross bar and bent inwardly substantially parallel to the front of said cross

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bar and spaced therefrom to form hinge pivots, sleeves slidably positioned over said inwardly bent ends of said frame, brackets pivotally mounted on said sleeves and attached to said front guard whereby said guard pivots about a horizontal axis through said inwardly bent ends, and helical springs disposed around said sleeves, said springs having ends reacting respectively against said cross bar and the lower portions of said front guard below the plane of said shelf thereby opposing pivotal operation of said front guard.

3. In a refrigerator door of the type having a recess therein for storage of foodstuffs, a shelf construction comprising a C-shaped wire frame rigidly positioned within said recess, said frame opening in the direction of said recess opening, a cross bar extending across the forward portion of said frame with the ends thereof attached to said frame, a front guard extending across the front of said recess adjacent the forward portion of said shelf, hinge means for mounting said guard for rotation about a horizontal axis, said hinge means comprising end portions of said C-shaped frame extending forwardly beyond the front of said cross bar and bent inwardly substantially parallel to the front of said cross bar and spaced therefrom to form hinge pivots, sleeves slidably positioned over said inwardly bent ends of said frame, brackets pivotally mounted on said sleeves and attached to said front guard whereby said guard pivots about a horizontal axis through said inwardly bent ends, helical springs disposed around said sleeves, said springs having ends reacting respectively against said cross bar and the lower portion of said front guard below the plane of said shelf to bias said guard to a vertical position, and a lug adjacent the bottom of said door adapted to strike against said cross bar when said guard has been pivoted away from said recess into a horizontal position.

4. In a refrigerator door of the type having a recess therein for storage of foodstuffs, a shelf construction comprising a C-shaped wire frame rigidly positioned in said recess, said frame opening in the direction of said recess opening, a cross bar extending across the forward portion of said frame with the ends thereof attached to said frame, a normally vertical front guard extending across the front of said recess adjacent the forward portion of said shelf, hinge means for mounting said guard for rotation about a horizontal axis, said hinge means comprising end portions of said C-shaped frame extending forwardly beyond the front of said cross bar and bent inwardly substantially parallel to the front of said cross bar and spaced therefrom to form hinge pivots, sleeves slidably positioned over said inwardly bent ends of said frame, brackets pivotally mounted on said sleeves and attached to said front guard whereby said guard pivots about a horizontal axis through said inwardly bent ends, helical springs disposed around said sleeves, said springs having ends reacting respectively against said cross bar and the lower portion of said front guard below the plane of said shelf thereby opposing pivotal operation of said front guard and projections integral with the underneath side of said cross bar inwardly of the ends of said helical springs to prevent said helical springs from sliding off said sleeves.

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