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SWING-OUT REFRIGERATOR SHELF ASSEMBLY

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FIG. 1

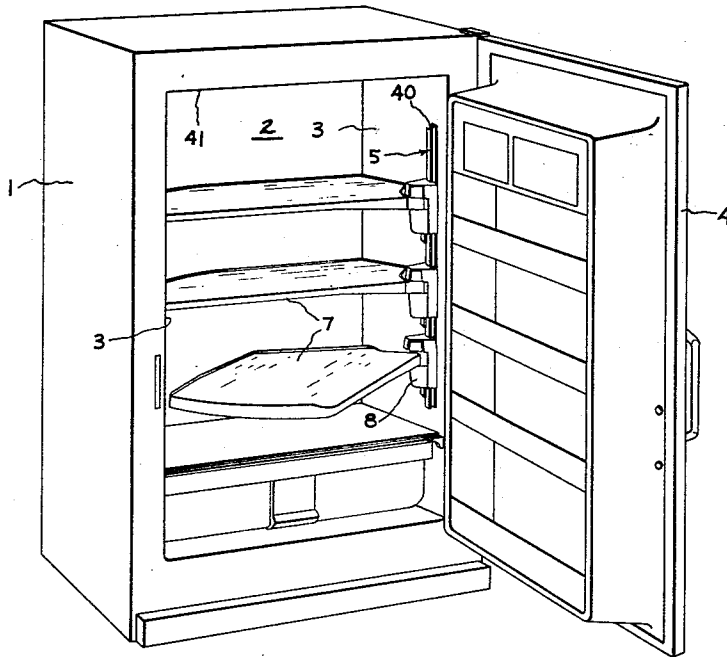
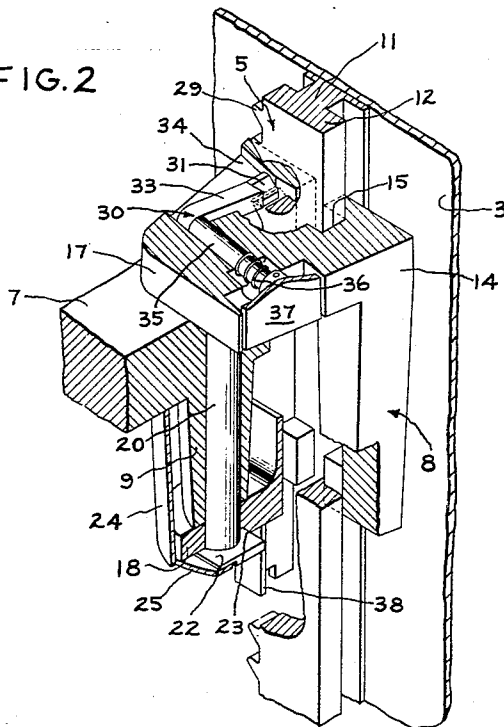


FIG. 2



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1

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3 Claims. (Cl. 312-293)

The present invention relates to a swing-out shelf assembly for refrigerators and is more particularly concerned with a refrigerator cabinet including a plurality of swing-out shelves having provision for vertical adjustment of the height of the shelves.

It is an object of the present invention to provide a simple and inexpensive arrangement for adjustably supporting a plurality of swing-out shelves within a refrigerator cabinet.

A more specific object of the present invention is to provide in a refrigerator cabinet means for supporting a plurality of swing-out shelves so designed that the shelves can be removed from the supporting structure for ease of cleaning.

Further 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 part of this specification.

Briefly, the present invention comprises a refrigerator cabinet including a storage compartment and a plurality of vertically disposed swing-out shelves supported on a vertical guide bar secured to a side wall of the compartment adjacent the access opening thereto. The guide bar comprises a T-shaped guide portion extending outwardly from the cabinet side wall with the cross arm of the guide portion spaced from the side wall. Each shelf is provided with an adjustable hinge means or mechanism having a guide portion including spaced forwardly projecting arms to which a hub on the associated shelf is pivotally connected by means of a pivot pin. A T-shaped recess in the rear or back wall of the hinge body portion is provided for receiving and slidably engaging the T-shaped guide portion of the guide bar. For the purpose of locking the shelf in any desired vertical position, ratchet teeth are provided on the rear end of the cross arm portion of the T-shaped guide portion and a reciprocal L-shaped pawl is carried by one of the pivot means arms so that one leg of the pawl can normally engage the ratchet teeth to lock the shelf in place. The other leg of the pawl extends through the hinge body portion arm and is provided with a pushbutton accessible from the front of the refrigerator for operating the pawl. By depressing the pushbutton and disengaging the pawl from the ratchet, the shelf can be manually raised or lowered within the cabinet.

The novel features which characterize the invention are set forth with particularity in the appended claims. The invention, however, both as to its organization and operation may be best understood by reference to the following description taken in conjunction with the accompanying drawing in which:

Fig. 1 is a front perspective view of a refrigerator cabinet with the access door in an open position to show the storage compartment and the shelf assembly of the present invention; and

Fig. 2 is a perspective view, partially in section, of a portion of the shelf assembly of Fig. 1.

2

Referring to the drawing, there is shown a refrigerator cabinet 1 having a storage compartment 2. The access opening 3 to the compartment 2 is closed by a door 4 hingedly connected to the cabinet 1 along one side of the access opening 3. The compartment 2 is refrigerated by means of an evaporator (not shown).

Rigidly secured to the side wall 3 of the compartment 2 is a guide bar 5. This guide bar which forms part of the present invention extends vertically within the compartment 2 adjacent the access opening to the compartment. A plurality of swing-out shelves 7 are mounted on the guide bar 5 so that they are rotatable out of the cabinet and also vertically adjustable with respect to one another and the guide bar 5. To this end, each of the shelves 7 is pivotally secured at one front corner thereof to an adjustable hinge means or mechanism 8 which is slidably and adjustably arranged on guide bar 5.

With particular reference to Fig. 2 of the drawing, it will be seen that the guide bar 5 comprises a T-shaped guide portion 11, the cross arm 12 of which is spaced from the compartment side wall 3. The hinge mechanism 8 comprises a body portion 14 having a vertically extending T-shaped slot 15 which is adapted to receive the T-shaped guide portion of the guide bar 5 and by means of which the mechanism 8 is maintained in sliding engagement with bar 5.

Each of the hinge mechanisms 8 also includes upper and lower arms 17 and 18 extending forwardly from the body portion 14 while the shelf 7 includes a hub 9 which is arranged between the upper and lower arms 17 and 18 and is pivotally secured thereto by means of a pivot pin 20. In the illustrated modification of the invention, the pivot pin 20 extends through the lower arm 18 and only part of the way through the upper arm 17 and includes a rectangular head 22 adapted to be received in a similarly shaped slot 23 provided in the lower surface of the arm 18, the slot and head cooperating to prevent turning of the pin 20 upon pivoting of the shelf 7. A cover plate 24 is secured to the body portion 14 of the hinge mechanism by means of screws (not shown) and this cover plate 24 includes a bottom portion 25 which partly overlies the head of the pin 22 to anchor the pin in its operating position in the arms 17, 18. By this hinge arrangement, it will be seen that each of the shelves 7 can be individually swung or pivoted from their normal position within the compartment 2 to an access position substantially outside of the compartment 2 when the door 4 is in the open position.

For the purpose of supporting each of the shelves in any selected vertical position within the compartment 2, the rear end of the cross arm 12 is provided with teeth 29 forming a rack or ratchet which in cooperation with a pawl 30 carried by the hinge mechanism 8 provides means for locking the shelf to the guide bar 5. The top surfaces of the teeth 29 have a reverse slope, that is, a slope downwardly from the point to the base, and the cooperating portion 31 of the pawl 30 is similarly shaped so that when the pawl is in engagement with the ratchet teeth there is a locking action between the two members which will serve to prevent accidental displacement of the shelf due to an accidental jar and will require a slight but positive lifting of the shelf before the pawl can be released from the ratchet teeth.

The pawl 30 is generally L-shaped and includes a leg 33 disposed in a recess 34 provided in the back side of the arm 17 with the tooth engaging portion 31 extending into that portion of the T-shaped recess 15 which encloses the ratchet teeth 29. The other leg 35 of the pawl extends through the arm 17 and is provided with a pushbutton 37 which is accessible from the front of the refrigerator when the door 4 is open. A spring 36 car-

ried by the leg 35 biases the pawl in a forward and hence tooth engaging position but permits the pawl to move rearwardly and disengage the ratchet teeth 29 upon the depression of button 37.

Since the vertical adjustment of one shelf relative to another can cause adjacent hinge mechanisms 8 to come in contact, the preferred embodiment of the present invention also includes means for maintaining these adjacent hinge mechanisms in spaced relation sufficient to prevent an operator's fingers from being accidentally 10 pinched between adjacent hinge mechanisms during shelf adjustment. For this purpose, there is provided on each of the hinge mechanisms a guard in the form of an L-shaped projection 38 extending downwardly on the rear front and the rear side of the T-shaped recess 15. This 15 guard 38 serves to prevent the main body portions 14 of the hinge mechanisms from coming so close together as to squeeze the user's finger and also covers the ratchet teeth 29 in this area so that the operator's fingers cannot be caught between the body portion 14 and one or more of the ratchet teeth 29.

As it occasionally becomes desirable to clean the shelves 7, a further feature of the present invention involves the construction of the guide bar 5 in such a manner that the shelves and the hinge mechanisms 8 can be disengaged completely from the guide bar 5 and removed from the compartment 2. For this purpose the upper end 40 of the guide bar 5 is terminated a distance from the top wall 41 of the compartment 2 greater than the overall height of each hinge mechanism 8 whereby 30 the mechanism can be slid upwardly and off the upper end 40 of the guide bar 5. By this arrangement, each shelf can be removed completely from the compartment, cleaned and then replaced with a minimum of effort.

While there has been shown and described a specific embodiment of the present invention, it is not desired that the invention be limited to the particular construction shown and described and it is intended by the appended claims to cover all modifications within the 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 including a plurality of walls including side walls defining a storage compartment having an access opening at the front thereof, a vertical guide bar secured to one of said side walls within said compartment and adjacent said access opening, said guide bar comprising a T-shaped guide portion extending outwardly from said one side wall with the cross arm thereof spaced from said one side wall, said cross arm having ratchet teeth on the rear edge thereof, a plurality of vertically spaced shelves in said compartment and adjustable hinge means for pivotally supporting each of said shelves on said guide bar for vertical adjustment of the shelf associated therewith, each of said adjustable hinge means comprising a body portion having a vertically extending T-shaped recess in the rear side thereof for receiving and slidably engaging said T-shaped guide portion and spaced upper and lower forwardly extending arms, each of said shelves including a hub at a front corner thereof, said hub being disposed between the upper and lower arms of the associated hinge means, a pin extending through said arm and said hub for pivotably connecting said associated shelf and hinge means, a recess in the rear side of one of said arms of said hinge means, a reciprocal L-shaped pawl carried by said one

arm having one leg disposed in said recess and including an end portion normally extending into said T-shaped slot to engage at least one of said ratchet teeth, the other leg of said pawl extending forwardly through said one arm and being provided with a pushbutton for operating said pawl, and spring means carried by said other leg biasing said pawl into engagement with said ratchet teeth, said pawl being movable against the action of said spring to disengage said pawl from said ratchet teeth and permit vertical adjustment of said associated shelf within said compartment.

2. A refrigerator cabinet including a plurality of walls including a side wall defining a storage compartment having an access opening at the front thereof, a guide bar secured vertically along one of said side walls within said compartment and adjacent said access opening, said guide bar comprising a T-shaped guide portion extending outwardly from said one side wall with the cross arm thereof spaced from said one side wall, said cross arm having ratchet teeth on the rear end thereof, a plurality of vertically spaced shelves in said compartment and adjustable hinge means for pivotally supporting each of said shelves on said guide bar for vertical adjustment of the shelf associated therewith, each of said adjustable hinge means comprising a body portion having a vertically extending T-shaped recess in the rear side thereof for receiving and slidably engaging said T-shaped guide portion and spaced upper and lower forwardly extending arms, each of said shelves including a hub at a front corner thereof, said hub being disposed between the upper and lower arms of the associated hinge means, a pin extending through said arms and said hub for pivotably connecting said associated shelf and hinge means, a recess in the rear side of one of said arms of said hinge means, a reciprocal L-shaped pawl carried by said one arm having one leg disposed in said recess and including an end portion normally extending into said T-shaped slot to a ratchet tooth, the other leg of said pawl extending forwardly through said one arm and being provided with a pushbutton for operating said pawl, and spring means carried by said other leg biasing said pawl into engagement with said ratchet teeth, said pawl being movable against the action of said spring to disengage said pawl from said ratchet teeth to permit vertical adjustment of said associated shelf, and a projection carried by said body portion and extending downwardly therefrom in overlapping relationship with said ratchet teeth for engaging the next lower pivot means to maintain adjacent hinge means spaced from one another a distance sufficient to prevent injury to an operator's finger accidentally inserted between adjacent hinge means during shelf adjustment.

3. A refrigerator cabinet as defined in claim 1 in which said cabinet includes a top wall and said T-shaped guide portion terminates short of said top wall of said compartment a distance sufficient to permit said hinge means to be slid off the upper end of said guide bar for removal of said hinge means and associated shelf from said compartment.

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