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R. O. CROUCH ET AL

3,371,796

REFRIGERATOR STORAGE RACK

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Fig 1

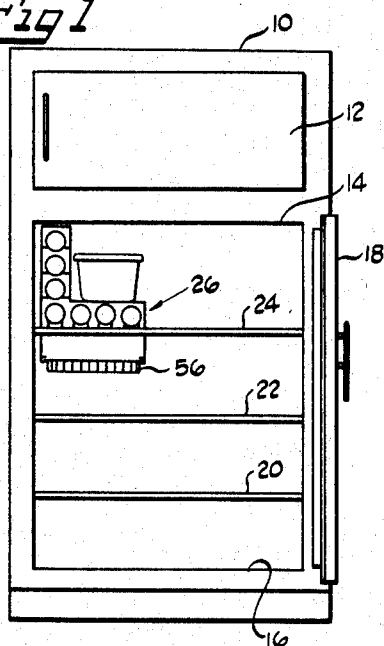


Fig 2

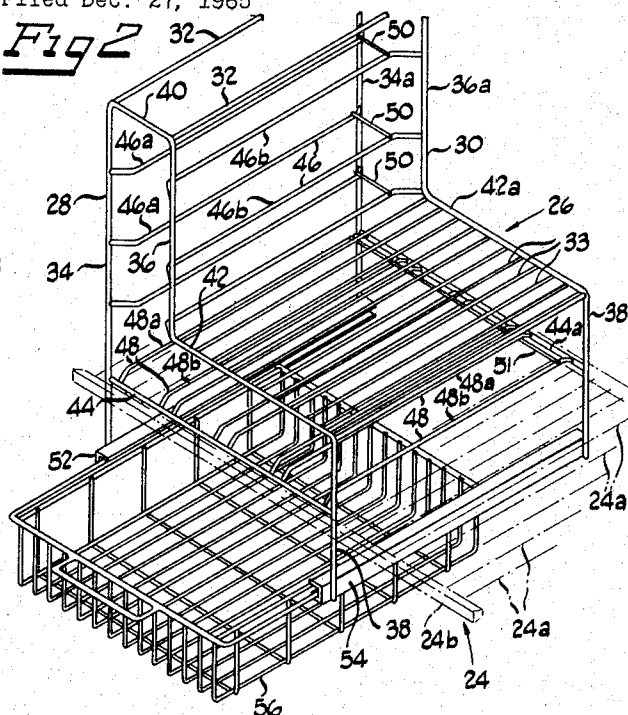


Fig 3

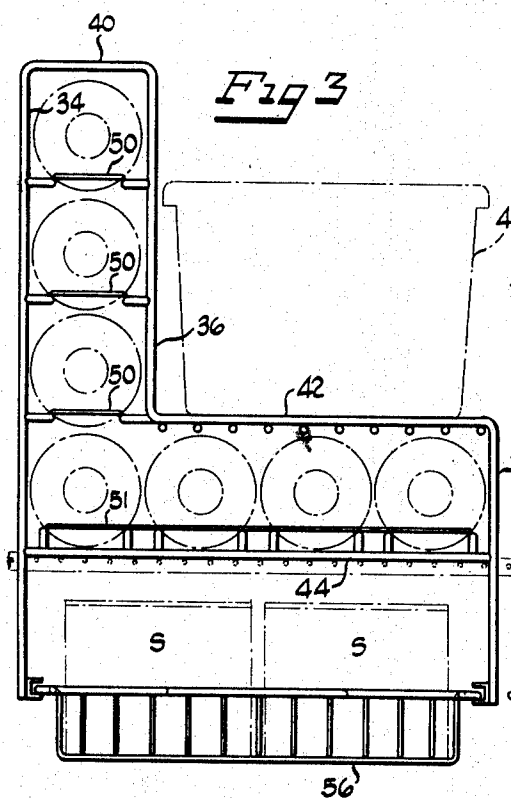
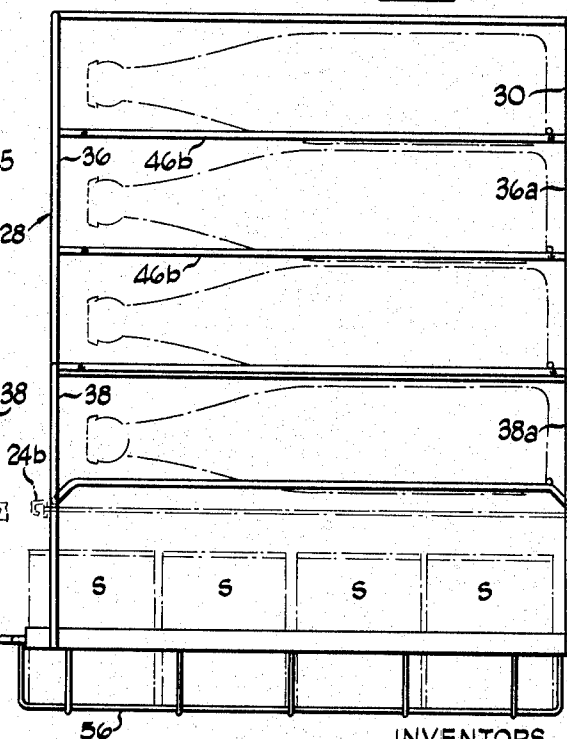


Fig 4



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REFRIGERATOR STORAGE RACK

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ABSTRACT OF THE DISCLOSURE

A wire rack structure usable as an addition to, and supportable by, a refrigerator shelf for maximizing the use of the space between the usual refrigerator shelves.

This invention relates to storage racks and particularly to storage racks adapted for use in conjunction with refrigerator shelving.

One of the problems encountered with a typical home refrigerator unit is that of maximizing the use of the storage space available. When shelving is positioned in a refrigerator to allow room for the storage of tall articles such as bottles, for example, a great deal of space is wasted. Contributing further to the organizational problem of using the available storage space in the best possible manner in the fact that the storage of small quantities of a variety of leftover articles often can use up considerable shelf space which could better be utilized for other purposes.

In view of these problems that continue to exist, a principal object of this invention is to provide a space saving storage rack which can be used with refrigerator shelving to allow tall articles such as bottles to be stored in a horizontal position.

Another object is to provide a space saving storage rack in which small containers can be stored at a point removed from a main shelf thus leaving the main refrigerator shelving free to be used for other purposes.

A still further object is to provide a storage rack so constructed that articles stored therein are readily accessible.

Another object is to provide a unitary storage rack which is independent of the refrigerator shelving and can be easily installed with ordinary refrigerator shelving found in most relatively modern home units.

Another object is to incorporate into such a storage rack article support means which is positioned immediately below the refrigerator shelf with which the rack is associated to thereby utilize storage capacity which normally would not be used.

Another object is to provide a device designed to accomplish the above purposes which is inexpensive and easy to manufacture.

In order to accomplish the above objects and provide the advantages described, we have devised a rack structure made of a wire framework including wire end members and wire cross-bars connecting the end members and constructed to provide separate support means for each of a plurality of tall articles such as bottles. The rack is made to be supported on a refrigerator shelf by means of cross-bar members which are adapted to rest on the refrigerator shelf. The frame is made to extend below the refrigerator shelf on which the rack is supported and on this lower portion of the frame, means are provided to slidably support a shelf or basket-type tray which can be conveniently moved in and out through the refrigerator access opening.

The above and other objects and advantages of the invention will be more readily apparent when read in connection with the accompanying drawings in which:

FIGURE 1 is a front view in elevation of an open re-

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frigerator showing in place a rack structure embodying the invention;

FIGURE 2 is a perspective view of the rack structure as it is mounted on a refrigerator shelf;

FIGURE 3 is an enlarged front view in elevation of the rack structure shown in FIGURE 1; and

FIGURE 4 is a side view in elevation of the rack structure of FIGURE 3 showing bottles and containers in place.

Referring now to the drawings there is shown in FIGURE 1, a typical household refrigerator 10 having a freezer section 12 at the top and a refrigerating or cooling section 14, the latter having an access opening 16 which is closed by a door 18. A plurality of vertically spaced shelves such as 20, 22 and 24 are generally mounted in the refrigerator and may be slidably mounted or mounted on rollers, for example, to allow the shelves to be pulled out from the refrigerator through the access opening 16.

In accordance with the objects of the invention, we have provided a novel storage rack 26 which may be used in conjunction with a refrigerator shelf and here shown as being used in conjunction with shelf 24. The rack 26 is constructed so that it may be easily installed in or removed from practically any make of home refrigerator of recent manufacture. Since it is a completely independent unit, it may be sold either with the refrigerator as an accessory item or separately as an item to be used in a refrigerator which is already in use.

In a preferred form of the invention, the rack 26 comprises a wire frame structure which includes two spaced substantially generally L-shaped end members 28 and 30 connected together in part by a plurality of cross-bar support means 32 and 33. The end members 28 and 30 are horizontally spaced a distance approximating the depth of the refrigerating space 14.

The L-shaped end members 28 and 30 preferably are formed of wire or rod material of circular cross-section. Since they are identical, only the structure of member 28 will be described and corresponding parts on member 30 will be designated by the same number including the suffix *a*. The end member 28 is composed of vertical wire members 34, 36 and 38. The members 34 and 36 of end member 28 are connected at their upper ends by a horizontal member 40. The lower end of vertical member 36 and the upper end of member 38 are connected by horizontal member 42. While all of these vertical and horizontal members could be separate members joined together by welding or other suitable means, it is preferable that the end member 28 be formed out of one piece of wire or rod material and bent into shape to comprise the members 34, 40, 36, 42 and 38 as shown, for example, in FIGURE 3. A tie rod 44 connects the lower portions of members 34 and 38 being welded thereto, or connected thereto by other suitable means. The tie rod 44 joins the member 38 about halfway intermediate the ends thereof and is disposed substantially parallel to the member 42.

As previously noted, the end members 28 and 30 are connected by a plurality of cross-bars 32 and 33. The cross-bars 32 connect the end members 28 and 30 at the upper end thereof while the cross-bars 33 are joined to the horizontal members 42 and 42a of the members 28 and 30 respectively.

The plurality of cross-bars 33 form an optional food storage shelf for a large container such as the one designated 45 in FIGURE 3.

The rack 26 also comprises a plurality of cross-bar pairs 46 and 48 including cross-bars 46a, 46b and 48a, 48b respectively. Cross-bars 46a join vertical members 34 of end members 28 and 30, and cross-bars 46b join vertical members 36 of end members 28 and 30. Cross-bars 48a

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and 48b join tie rods 44 and 44a of the members 28 and 30 respectively. Thus the cross-bar pairs 46 and 48 provide additional structural support for the rack 26 in addition to their article supporting function hereinafter described in more detail.

The cross-bars 46a and 46b of each cross-bar pair 46 and the cross bars 48a and 48b of each cross-bar pair 48 are horizontally spaced a predetermined distance so that they can provide an adequate support or rack for an elongated article such as a large beverage bottle, for example.

The ends of cross-bars 46a and 46b are bent outwardly at each end and these outwardly bent ends are secured to the vertical members 34 and 36 at the front and 34a and 36a at the rear of the rack structure. Stop rods 50 span cross-bars 46a and 46b and stop rod 51 spans cross-bars 48a and 48b to limit the rearward movement of articles placed thereon.

In this embodiment, the vertical members 34 and 36 are horizontally spaced apart a sufficient distance to accommodate a plurality of bottles in a vertical stacked relationship each being supported by a cross-bar pair 46. The horizontal member 42 and tie rod 44 are vertically spaced to provide clearance for a single row of horizontally disposed bottles each bottle being supported by a cross-bar pair 48.

At the lower end of each vertical member 34 and 38 of the two end members 28 and 30, there is provided a means for slidably supporting a tray, shelf or the like. As illustrated in this embodiment, such means may comprise a pair of substantially U-shaped channel irons 52 and 54 connected respectively to the two members 34, 34a and the members 38, 38a. These channel irons are adapted to slidably receive the edges of a basket type tray 56 or other desirable shelf which may be utilized for supporting a plurality of small containers S.

The channel irons 52 and 54 must be narrow enough to permit them to fit between adjacent cross-bars 24a of the shelf 24 to permit the rack to be "dropped through" the shelf 24 when it is positioned in place.

It will be observed from FIGURE 2 that the lower ends of the vertical members 34, 34a and 38, 38a extend below and through the shelf 24 which is shown in dotted lines, the lower ends of members 34, 34a and 38, 38a being positioned between cross-bars 24a of shelf 24. Being thus positioned, the rack 26 is secured against any substantial lateral movement across the refrigerator. The lower ends of members 34 and 38 of end member 28 also are positioned behind the horizontal transverse front bar 24b of shelf 24 to secure the rack 26 against outward movement. It will be further observed that tie rods 44 and 44a rest on cross-bars 24a of shelf 24 when the rack is in position on the shelf 24.

While the rack 26 is shown in FIGURE 1 at the left-hand side of the refrigerator, it will be apparent that it could be positioned anywhere along the shelf 24. The design of the rack itself could be reversed so that the portion of the rack at the left-hand side for stacking bottles one above the other between members 34 and 36 could be formed at the right-hand side of the rack. This would be a matter of choice to accommodate different refrigerators.

With respect to the tray 56, it will be observed that it may be so designed that the lowermost portion thereof is positioned well above the refrigerator shelf immediately below it (see FIGURE 1). Thus ample room is still available to store items below tray 56 on shelf 22.

The provision of horizontal storage facilities for tall items such as bottles permits easy access to each individual item without moving any of the others. Furthermore, the portion of the shelf on which the rack is mounted is more effectively utilized by using at least a portion of the space above the shelf to its full height. At the same time provision has been made for obtaining easy access to a collection of small containers S which may be

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supported by the tray 56 which can be moved in and out on the guide channels 52 and 54. Furthermore, these small containers do not take up other valuable storage space but, in effect, are lifted up out of the way to permit full utilization of the main shelf space immediately below them (see FIGURE 1). The storage rack has the further advantage that it can be easily installed in an existing refrigerator simply by removing the shelf from the refrigerator, dropping the rack through the shelf at any desired position along its width and reinserting the shelf in the refrigerator.

While a preferred embodiment of the invention has been specifically disclosed, it is to be understood that the invention is not limited thereto as many variations will be readily apparent to those skilled in the art and the invention is to be given its fullest possible scope of interpretation within the terms of the following claims, consistent with the prior art.

What is claimed is:

1. A wire storage rack adapted especially for being supported by the usual refrigerator shelf, comprising: means defining a main frame including means forming a pair of vertically positioned generally L-shaped end portions, said last-named means including wire members;
 - 25 a plurality of first cross-bar means connecting said vertically extending end portions;
 - a plurality of second cross-bar means arranged to provide a plurality of individual cross-bar supporting means adapted to individually support a plurality of bottle-like articles in a substantially horizontal position, said vertically extending end members being further provided with extensions adapted to be passed downwardly below the associated regular refrigerator shelf and said extensions being provided with means effective to support articles at a level below that of said shelf.
2. The device of claim 1 wherein certain of said first cross-bar members being effective to define a relatively fixed shelf structure forming part of said main frame means adapted to be spaced at an elevation above the associated supporting refrigerator shelf.
3. The device of claim 1 wherein said frame means includes an upper portion and a lower portion, said lower portion being adapted to extend below the refrigerator shelf, said cross-bar support means being formed in said upper portion of said frame means; and including means defining slidably mounted shelf means in said lower portion.
4. The device of claim 1 wherein said frame means includes an upper portion and a lower portion, said lower portion being adapted to extend below the refrigerator shelf on which the rack is mounted, certain of said first cross-bar members defining a relatively fixed shelf structure on the upper portion of said frame means, adapted to be spaced above the associated regular refrigerator shelf; said cross-bar support means being formed in said upper portion of said frame means; and said arrangement further including means defining a slidably supported shelf on said lower portion.
5. The device of claim 4 including tie rod members forming part of said frame means and running transversely to said second cross-bar members, said tie rod members forming supporting means effective to support the rack from an associated regular refrigerator shelf.
6. The device of claim 4 wherein said lower portion includes wire portions integral with and depending from said upper portion; and including means

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defining a U-shaped channel connected to said depending wire portions for slidably supporting said shelf means on said lower portion.

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