This invention relates to refrigerator cabinets in general and more particularly to removable shelves and storage containers provided therein.

Most refrigerators are provided with shelves and food storage containers which are removable to facilitate cleaning and for other reasons. The large size storage containers are commonly known as crisper compartments or containers because of their use for storing and maintaining the freshness of leaf vegetables and the like.

It is common practice to provide a pair of crisper drawers in most refrigerators and, when possible, to have them side by side in the lower part of the food storage compartment. As will be appreciated, this is the cooler and more humid part of the refrigerator.

Unfortunately, the preferred arrangement is not always possible and one of the major reasons has been the obstructive overhang of the refrigerator door when open which prevents easy access and removal of the crisper drawers. When the refrigerator door is formed to swing into the food compartment space and has food storage shelves provided on its inner wall, it protrudes sufficiently to overhang the compartment space when it is or can only be opened about 90 degrees. Accordingly, a crisper drawer located near the hinge side of the door normally cannot be completely withdrawn.

Some refrigerator cabinet manufacturers have purposely eliminated the lower food storage shelf on the refrigerator door to avoid the obstruction otherwise provided. Obviously, this is a poor solution since maximum food storage space is desirable in a refrigerator.

Although at first blush this seems a relatively simple problem to solve, nothing could be further from the actual facts.

Crisper drawers must be raised up and spaced from bottom, side and back walls of the storage compartment for good cooling and the circulation of cooling air therewith in forced air circulation systems. The cover or covers thereover should be usable as a food storage shelf. Accordingly, secure support for the covers is necessary. They must also provide a reasonably good closure for the crisper compartments or containers.

These and other desirable aspects come readily to mind and make the problem more complex than at first appreciated.

It is an object of this invention to provide storage container means which are readily removable from a given space despite a partial obstruction of the means of access normally provided thereto.

It is an object of this invention to provide storage container means in a refrigerator cabinet within the space which is normally at least partially obstructed by the door, when less than fully open, and to still be able to remove the container means without difficulty.

More, particularly, it is an object of this invention to provide separate storage container and cover members side by side in a refrigerator and movable sideways when one is removed so that the other can also be removed and neither are disturbed by the disposition of the refrigerator door.

Still more particularly, it is an object of this invention to provide a pair of separate cover members, which together form a shelf, and which each support a crisper compartment drawer thereunder. The covers are supported at their front and back edges on guide rails and are laterly slideable thereon after one thereof is removed. Accordingly, after the drawer furthest from the refrigerator door is removed, and its cover is lifted out, the other cover and its drawer can be moved over and the drawer can then be fully withdrawn without being obstructed by the refrigerator door.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a front perspective view of a refrigerator embodying the present invention and showing a pair of storage containers and shelves in the lower part thereof.

FIGURE 2 is a fragmentary front perspective view of the refrigerator of the first drawing figure and shows the steps of removing one of the storage units and shelves.

FIGURE 3 is a fragmentary and enlarged front perspective view of part of the refrigerator of the first drawing figure and shows a further step in the removal of the shelves and storage containers provided therein.

FIGURE 4 is a sectional view taken along the lines 4-4 of FIGURE 1 and shows the storage units pulled forward.

FIGURE 5 is a sectional view taken along the lines 5-5 of FIGURE 4 and showing the storage units fully retracted within the storage compartment of the refrigerator.

FIGURE 6 is a sectional view similar to FIGURE 5 showing the drawer compartment slid outwardly on its tracks from the storage compartment.

FIGURE 7 is a sectional view illustrating the removal of a shelf from its support after the storage unit has been removed.

Shown in the drawing is a refrigerator cabinet 20 having a food storage compartment 22 to which access is had through opening 24 closed by a door 26. The door 26 is mounted to swing on vertical hinges 28.

The door 26 is provided with a plug or dyke section 30 that projects from the inner side of the door into the compartment 22 when the door is closed. This section 30 is preferably formed with an inwardly open recess and is provided with spaced vertical shelves 32 for the storage of articles of food thereon that are to be kept refrigerated. The section 30 extends into close proximity to the sides of the compartment about the opening 24 to minimize air circulation about the opening, particularly where the air is under forced circulation in the compartment.

The door is provided with a suitable gasket 36 that engages about and seals the opening 24 when the door is in closed position.

Upon opening of the door 26, the section 30 can reduce accessibility into the compartment 22 particularly when the cabinet 20 is so located in a corner of a room that a wall limits the opening of the door to 90 degrees or less. When this occurs the section 30 projects across the opening 24 sufficiently to form an obstruction which limits horizontal outward sliding movement of articles and, most particularly, prevents removal of the storage container that is positioned within the lower part of the compartment adjacent to the hinge side of the door.

The present invention provides an arrangement that permits a full outward sliding of such a container for greater ease in its removal from the cabinet.

The compartment 22 is formed by a liner 40 having a bottom wall 42, a rear wall 44 and side walls 46 which are in spaced parallel relation to adjacent walls of an outer shell 36 between which are placed suitable heat insulation material 47.

The compartment 22 is provided with a plurality of
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3 vertically spaced shelves 48. The lower shelf in the compartment comprising a pair of imperforate shelf sections 50, 52 which are arranged in a side by side supported arrangement. Each of the shelf sections 50, 52 slingly support respective storage containers 54, 56.
The shelf sections 50, 52 may, if desired, be located at any vertical position within the compartment.

Each shelf 50, 52 is supported at its rear edge on guides 60 and at its forward or front edge on a guide rail or member 62. The guides 60 comprise a plurality of segments 63 formed integrally with the rear liner wall 44 and which are horizontally spaced along the wall 44 to serve to guide the sliding movement of each shelf supported thereon. The front guide rail or member 62 is in the horizontal plane of the guide 60 and extends in spaced parallel relation thereto. The opposite ends of the guide member 62 are supported in pockets or openings 64 formed in respective brackets 66 which are suitably secured by screws to the respective side walls 46 of the compartment.

Each shelf 50, 52 is similarly formed. It is preferably moulded of plastic material to provide an imperforate shelf wall and integrally formed parallel guide rails 70, 72 on the underside of the shelf. The rails 70, 72 extend longitudinally along respective side edges of the shelves and substantially from the front to the rear edges thereof.
The storage containers 54, 56 are each formed with flanges 74 which extend longitudinally and outward along each side thereof and are adapted to be received on a respective rail 70, 72 of a shelf for depending support therebelow. Each flange 74 is formed to include a depression which forms a slide button 76 that contacts the rail and facilitates easy sliding movement for the container. They also serve as a stop to limit outward drawer-pull withdrawal movement of the container from beneath the shelves by abutment against a shoulder 78 provided adjacent the front portion of each rail 70, 72. The opposite or rear end of each rail terminates at an abutment 80 parallelizing the rear edge of the shelf and it serves to limit and stop retracted movement of each of the containers in a position whereby each shelf serves as a cover for its respective container. The shelf, as a cover for a container, is such as permits limited air circulation from the compartment into the container and the shelves, when in side by side arrangement, are spaced from the adjacent liner walls to allow air circulation to pass downwardly therebetween and about the outer sides of the container for cooling the contents therein.

To prevent unintentional forward sliding movement of the shelves, the front edge supporting bar 62 is formed with an upwardly extending vertical ridge 82 against which the front edge of the shelves abut and are held.

A recess or groove 84 is formed to extend longitudinally along the rear edge of each shelf and is adapted to receive therein the guide 60. The groove 84 extends the full width of each shelf and is open at each end to permit free lateral sliding movement of the shelf on the guides for movement from one side wall to the opposing side wall. Though the guide 60 is shown as including segments 63 it will be obvious that it may be a continuous member extending the full width of the rear wall from side wall to side wall only, or, instead of being formed integral with the rear wall, it might be a separate attachable member.

Each storage container 54, 56 is slidable outwardly on its respective guide rails from beneath its cover or shelf 50, 52 and if the door 26 is fully open, beyond 90 degrees, both containers may be readily removed from the compartment through the opening 24. To remove the containers from their respective guide rails they are pulled out until the glide buttons 76 reach the shoulders 78 and then the forward end of the container is tilted upwardly, or the back end may be raised, to permit the part 76 to ride over the shoulder 78 and out through the forward open end of the guide rails.

When the compartment door 26 is limited to an opening movement of 90 degrees or less the containers 54, 56 are limited in their outward sliding movement by the overhang of the plug section 30 of the door. Although this limited movement of the container does allow some access into the compartment it prevents full removal.

To facilitate the removal of the container 52, the user first removes the container 54 from beneath the shelf 50, then removes the shelf 50 from its supports by lifting the forward edge of the shelf above the ridge section 82 of the bar 64, see FIGURE 7, and then draws the shelf forward to disengage the groove 84 from the guides 63. Following removal of the shelf 50, the shelf 52 is slid laterally on its guides until it is beyond the line of obstruction offered by the door, or until it has been located in the space vacated by the removed shelf and container. Once the shelf 52 has been moved out of the line of obstruction, see FIGURE 3, the container 56 may be readily removed from beneath its supporting shelf and from the compartment.
The shelves 50, 52 and containers 54, 56 are interchangeable, each being formed identical in construction so that both shelves and containers be removed from the compartment either shelf may be first reinstated to the supports in either position and each shelf may receive either container irrespective of what position it occupies on the supports.

Although only a preferred form of the invention has been illustrated and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:
1. In a storage compartment space, the improvement comprising a pair of horizontally disposed laterally extended parallel spaced guide rails, cover members received and supported on said guide rails for lateral slide movement and each including drawer slide supports extending below the plane of said guide rails, drawer members having drawer slide engagement with the supports of said cover members and being adapted for drawer-pull disengagement therefrom, said cover and drawer members being interchangeable, and said cover members in combination extending between the ends of said guide rails and being laterally immobile for providing a relatively fixed storage space shelf.

2. The storage compartment improvement of claim 1, said cover members being individually removable from engagement with said guide rails and being laterally slidable into the position previously occupied by another thereof following its removal.

3. In a refrigerator cabinet having a food storage compartment capable of being obscured in part by a compartment door overhanging one side of the front opening thereof, the improvement in storage container construction, comprising:

first and second storage container receptive spaces in said by side arrangement and extending across a food storage compartment space, first and second shelf providing means disposed respectively over said first and second storage container receptive spaces, fixed means for supporting said first and second shelf providing means for independent lateral slide movement over said storage container receptive spaces, and first and second storage containers receptive in said spaces in drawer slide supported engagement with said shelf providing means, said first storage container being unobstructively removable from said first space and from engagement with said first shelf providing means, and said first shelf providing means being subsequently
removable from over said first space and said second shelf providing means being laterally slideable and carrying said second storage container therewith into said first container receptive space for subsequent unobstructed removal therefrom.

4. The storage container construction of claim 3, said fixed means for supporting said first and second shelf providing means including a guide rail receptive of the front edge thereof and having an outer disposed ridge restraining said shelf means against transverse movement with said containers, and said shelf providing means each including a groove formed in the back edge thereof and extending the width thereof for receiving other of said fixed supporting means therein and requiring that said storage containers be disengaged from said shelf providing means to allow lifting the front edges of said shelf providing means from said guide rails and the tilting thereof prior to disengagement therefrom.

5. A refrigerator cabinet, comprising:
a food storage compartment including an opening affording access thereto and a vertically hinged door for closing said opening, said door being partially received in said compartment when closing said opening and overhanging one side of said opening when less than fully open, a food storage container receptive space provided across said food storage compartment and including a food storage shelf defining the upper wall thereof, fixed means provided in said food storage compartment for supporting the back and front edges of said storage shelf, said storage shelf including a pair of separate and interchangeable cover members providing a laterally immobile shelf together on said supporting means, said shelf supporting means including a guide rail receptive of the front edges of said cover members for support and lateral slide movement thereon and having an outer disposed ridge precluding inadvertent transverse movement thereof through said access opening.

said cover members including a groove provided in the back edge and extending the width thereof for receiving the means supporting the back edges thereof for lateral movement relative thereto, depending side rails provided on said cover members and extending below the plane of the guide rail supporting the front edges thereof, upwardly open food storage containers having means provided on the side walls thereof for cooperative drawer-slide engagement with the depending side rails of said cover members, said containers being received and supported by respective of said cover members in spaced relation to each other and the walls of the food storage compartment in which disposed, avoidable stop means cooperatively provided between said cover side rails and said containers for the disengagement of one from the other thereof, said container members having a width permissive of the passage thereof through the side of said storage compartment opening unobstructed by said door when less than fully open, said cover members being removable from said supporting means upon disengagement of said container members therefrom, and said cover member and container next adjacent said door being laterally adjustable, following the removal of the other of said containers and cover member, into a position unobstructed by the overhang of said compartment door for the full removal of said container therefrom.

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