May 18, 1965 W. E. BILLUPS 3,184,276

SLIDING SHELF DOOR STRUCTURE

Filed April 2, 1962 2 Sheets-Sheet 1

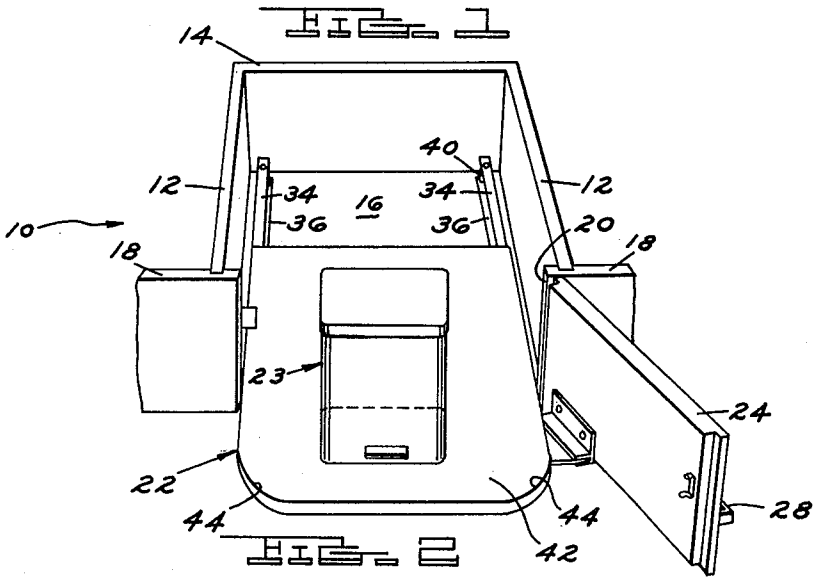


FIG. 2

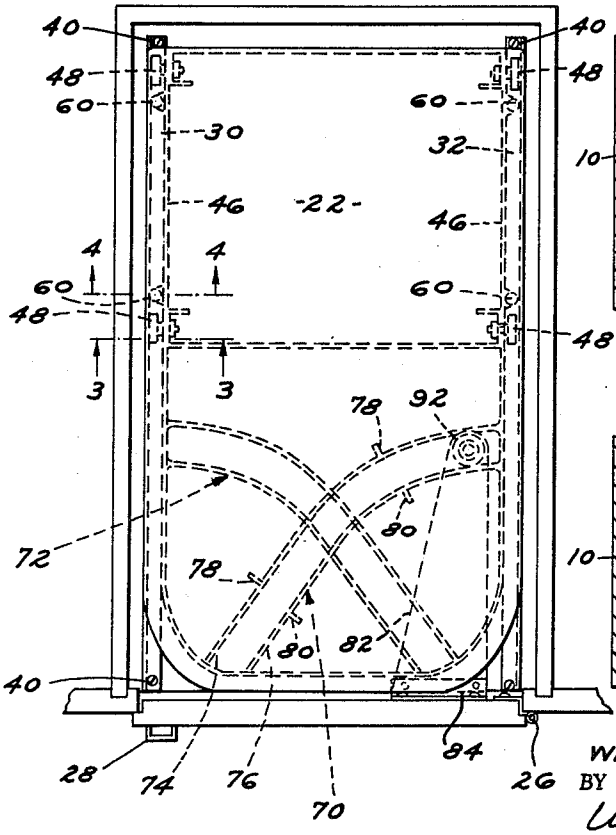


FIG. 3

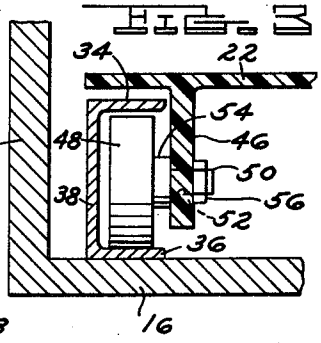
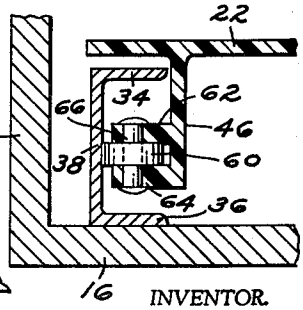


FIG. 4



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Filed April 2, 1962 2 Sheets-Sheet 2

FIG. 5

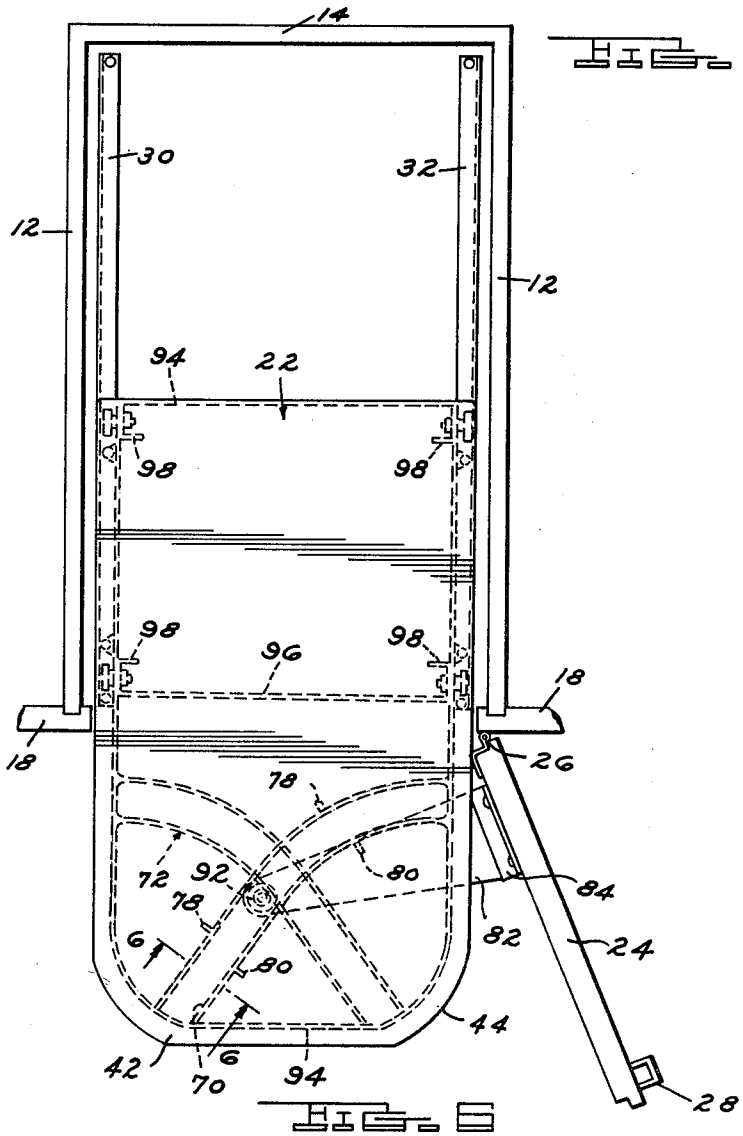
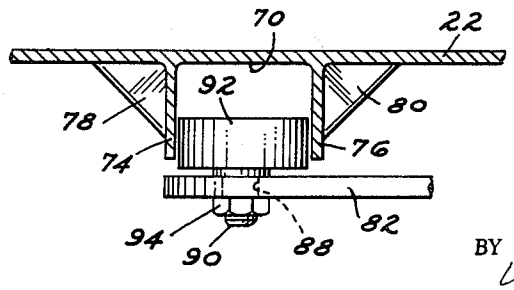


FIG. 6



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SLIDING SHELF DOOR STRUCTURE

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This invention relates to cabinets and more particularly to a kitchen cabinet provided with a hinged door and means connected thereto by which a carriage or tray is housed within the cabinet when the door is closed and is withdrawn from the cabinet to an accessible position when the door is opened.

The carriage or tray of the present invention is particularly adapted in kitchen sinks and cabinets for housing a waste can, garbage can, or the like. The waste can or garbage can is generally housed in the cabinet, except when in use so as not to detract from the appearance of the cabinet in its environment.

It is an object of the present invention to provide a cabinet for waste cans, garbage cans, or the like, having means for positively and easily moving a can between a position in which it is fully housed within a cavity formed in the cabinet and a position of accessibility from without the cabinet.

Another object of the present invention is to provide a cabinet of the aforementioned type having a carriage or tray movable therein wherein such carriage or tray is operable by the opening and closing of a door of said cavity.

Still another object of the present invention is to provide a cabinet of the aforementioned type which includes a movable or slidable carriage or tray made of plastic material and means provided between the tray and door for operating the tray without disturbing the can on the tray.

A further object of the present invention is to provide a cabinet of the aforementioned type which is simple in construction, economical to manufacture, and easy to maintain.

A still further object of the present invention is to provide a cabinet formed with a recess opening through one side thereof, a pair of laterally spaced longitudinally extending tracks along the bottom wall of the cabinet, threaded fasteners at the opposite ends of each of the tracks for connecting the tracks to the bottom wall of the cabinet, said fasteners having abutment surfaces, a carriage disposed in said recess opening and arranged for movement in and out of the cabinet, two tranversely spaced pairs of rollers on the underside of said carriage, one pair of rollers along each side thereof and engaging one of said tracks, said pairs of rollers being arranged to roll lengthwise of said tracks upon movement of said carriage, a door hingedly secured to an edge of said recess opening and arranged to close the opening thereto, and means linking said door and said carriage whereby opening of said door withdraws said carriage from said recess opening and closure of said door returns said carriage to said recess opening, the maximum amount of withdrawal of said carriage upon of said door being determined by the engagement of the rollers at the forward end of the carriage with the abutment surfaces on the fasteners opposite therefrom.

A further object of the present invention is to provide a cabinet of the aforementioned type wherein said linking means comprises an actuating arm connected to the inner surface of said door, a downwardly facing trackway integrally formed on the underside of said carriage, and a follower carried by said arm for engagement with said trackway.

Another object of the present invention is to provide

a cabinet of the aforementioned type wherein the carriage is made from plastic material.

Still another object of the present invention is to provide a plastic carriage or tray which is adapted to be inserted in a cabinet and actuated by a door which is mounted for a left-hand or right-hand operation.

A further object of the present invention is to provide a cabinet of the aforementioned type wherein the tray which is suitable for either a left-hand or right-hand operation, is provided with a pair of downwardly facing trackways, one of said trackways being suitable for one of said operations.

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.

FIGURE 1 is a perspective view of the cabinet illustrating the tray in an open position.

FIGURE 2 is a plan view of the cabinet illustrating the tray in a closed position corresponding to the closed position of the cabinet door.

FIGURE 3 is a sectional view taken on line 3—3 of FIGURE 2.

FIGURE 4 is a sectional view taken on line 4—4 of FIGURE 2.

FIGURE 5 is a plan view of the cabinet illustrating the tray in an opened position corresponding to the opened position of the cabinet door.

FIGURE 6 is a sectional view taken on line 6—6 of FIGURE 5.

In the illustrated embodiment of the present invention, there is shown a cabinet 10 formed by side walls 12, rear wall 14, and bottom wall 16, and front wall 18. The cabinet 10 is adapted to be included in a built-in cabinet system, such as is provided beneath the sink in a kitchen. The front wall 18 is provided with a vertical opening 20 through which the tray or carriage 22 is adapted to move, as will be subsequently explained. The carriage 22 is adapted to carry a garbage can 23 or the like. A door 24 is hingedly connected at one side of the opening 20 to the wall 18 by means of a vertically mounted hinge 26. The door 24 is provided with the usual handle 28 which facilitates the opening and closing of the door 24.

Mounted lengthwise in the cabinet 10 are a pair of transversely spaced longitudinally extending tracks 30 and 32. The tracks 30 and 32 are of substantially channel shaped cross-section throughout their longitudinal extent. Each of the tracks 30 and 32 is provided with a pair of vertically spaced parallel flanges 34 and 36 which are separated by a web 38. Threaded screws or bolts 40 are provided at the opposite ends of the tracks 30 and 32 for connecting the tracks to the bottom wall 16 of the cabinet 10. The threaded fasteners 40 extend through the flanges 34 and 36 into the bottom wall 16. The parts of the fasteners 40 in between the flanges 34 and 36 provide abutment surfaces which are used for a purpose to be hereinafter explained.

The tray or carriage 22 is of molded plastic construction and is designed so that it may be used for either a left-hand or a right-hand operated door. The tray 22 may be made from such plastic materials as Cycolac or linear polyethylene. The tray 22 has a substantially smooth upper surface 42 and is provided at the forward end thereof with rounded corners 44 so as to avoid interference with the door 24.

The underside of the carriage of tray 22 is provided with a pair of transversely spaced longitudinally extending flanges 46. Each flange 46 carries a pair of longitudinally spaced roller bearings 48 at the rear half of the carriage 22. Each roller 48 is mounted on a threaded stub shaft 50, which is adapted to extend through an

opening 52 provided in the flange 46. A spacer 54 is also mounted on stub shaft 50 and separates roller bearing 48 from the flange 46. The stub shaft 50 is fixedly connected to the flange 46 by means of a nut 56, as best illustrated in FIGURE 3. The roller bearings 48 are adapted to roll along the top surface of the flanges 36 upon movement of the carriage 22.

Intermediate each pair of roller bearings 48 are provided a pair of longitudinally spaced guide roller bearings 60. The guide roller bearings 60 are mounted between a pair of ears 62 and 64 and are connected to said ears by means of a pin 66, as best illustrated in FIGURE 4. The guide bearings 60 are adapted to move along the webs 38 of the tracks upon movement of the carriage 22 and are arranged to maintain the carriage 22 in predetermined longitudinal alignment with respect to the tracks 30 and 32.

The forward end of the carriage 22 is provided with a pair of integral downwardly facing trackways 70 and 72 on the underside thereof. Trackway 70 is designed for a right-hand door operation, as illustrated. The other trackway 72 is designed for a left-hand door operation. The trackway 70 is integrally formed with the tray or carriage 22 and is provided with a pair of downwardly facing walls 74 and 76, which are supported by reinforcing gussets 78 and 80 respectively.

An actuating arm 82 is connected between the door 24 and the tray 22. The actuating arm 82 is provided at one end with the flange 84 which is bolted to the door 24. The other end of the actuating arm 82, as best illustrated in FIGURE 6, is provided with an opening 88, which is adapted to receive a threaded stub shaft 90 for the cam follower or roller 92. The follower 92 is held in a predetermined fixed position with respect to the trackway 70 by a nut 94 threaded on the stub shaft 90.

In operation, when it is required to move the tray or carriage 22 from the closed position illustrated in FIGURE 2 to the opened position illustrated in FIGURE 5, all that is required is that the door 24 is opened. As a result, the actuating arm 82 moves with the door 24 and moves the follower 92 in the trackway 70 against the wall 76 so as to create a force against the wall 76 which moves the tray 22 to an opened position. The follower 92 also exerts a force against the wall 74 of the trackway 70 when the door 24 is moved in a closing direction. With such a construction the tray 22 travels back into the cabinet 10 ahead of the closing door 24.

The amount of withdrawal of the tray 22 from the cabinet 10 is limited to an amount which is determined by the engagement of the rollers 48 at the forward end of the tray 22 with the abutment surfaces aforesaid provided on the threaded fasteners 40. The fasteners 40 not only attach the tracks 30 and 32 to the bottom wall 16 but also limit the forward movement of the tray 22 in the opening direction. In the present embodiment the tray 22 is designed to move out approximately half the length of the tray.

The tray 22 is also provided with integral transversely extending ribs 94 at the ends thereof and an intermediate rib 96 midway between the ends of the tray 22. The ribs serve as reinforcing braces for the tray 22 along with gussets 98.

It will be noted that the invention provides a construction characterized by its simplicity and ease of manufacture. The tray is constructed from a plastic material by simple molding operation and is so formed to insure rigidity throughout. With such an operation the flanges, ribs, ears, gussets, trackways, and holes provided in the flanges are all formed during the molding operation. The trackways provide cam paths with adequate bearing surfaces for the cam follower or roller 92. This insures ease of operation with no binding or sticking of parts.

With such a construction the tray 22 is adapted to be moved forwardly to a position where the garbage can 23 is readily accessible from without the cabinet 10.

It should be observed that the tray 22 has two trackways integrally formed on the underside thereof so that the tray may be conveniently adapted for use with a door which is pivotally mounted for either a left-hand or right-hand operation.

In addition, the corners of the tray are rounded and the parts so designed that interference between the corners of the tray and the door is prevented.

The drawings and the foregoing specification constitute a description of the improved sliding shelf door structure in such full, clear, concise, and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claim.

What I claim as my invention is:

In a cabinet construction comprising a cabinet having an elongated recess through the front thereof and a door for the cabinet hinged for swinging movement about a vertical axis at one side of the recess: a pair of horizontal, laterally spaced parallel carriage tracks within said recess fixedly connected to the bottom of the cabinet and extending from front to rear of said recess, each of said tracks having a transverse channel-shaped cross-section and including a vertical web and a pair of laterally inwardly extending top and bottom horizontal flanges, an elongated substantially flat one piece carriage made from a plastic material disposed in the recess and arranged for horizontal forward and rearward movement into and out of the cabinet, said carriage including on the bottom surface thereof a pair of integral downwardly extending elongated parallel flanges spaced inwardly from the longitudinal edge portions of the carriage and extending forwardly and rearwardly, the flanges on said carriage extending into the space between said tracks and being located closely adjacent and parallel to said tracks with said longitudinal edge portions overlying the top flanges of said tracks, a front pair and a rear pair of laterally spaced rollers mounted on the respective flanges of said carriage, the rollers of each pair engaging the bottom flanges of said tracks, said pairs of rollers holding the longitudinal edge portions of the carriage above and spaced from the top flanges of said tracks, said rollers being arranged to roll on said bottom flanges lengthwise of said tracks upon movement of said carriage, means linking the door and said carriage whereby opening of the door withdraws said carriage forwardly from said recess and closing of the door returns said carriage rearwardly to said recess, said linking means comprising an elongated actuating arm connected on one end thereof to the inner surface of the door and extending into the space between said tracks beneath the bottom surface of said carriage when the door is closed, said carriage also including an integral downwardly facing trackway on the bottom surface thereof intermediate said flanges on said carriage, said trackway including a pair of laterally spaced downwardly extending elongated parallel side walls extending from one of the flanges of said carriage to a point closely adjacent the forward edge of the carriage, said one flange of the carriage being the flange closest to the hinged axis of the door, said trackway including only two portions namely an inner arcuate portion adjacent said one flange of the carriage of less than 90 degrees and an outer portion which is substantially straight and closed at the forward end thereof, a cam follower carried by the other end of said actuating arm for engagement with the side walls of said trackway, said cam follower and said arm being located closely adjacent said one flange when the door is closed, a front pair and a rear pair of guide bearings mounted at the outer sides of the flanges on said carriage for engagement with the webs of said tracks and holding the flanges on said carriage spaced laterally inwardly from said tracks, said guide bearings having their axes arranged substantially perpendicular to the axes of said rollers for guiding said carriage during lengthwise movement there-

of, said front pair of bearings being near to but rearward of said front pair of rollers and said rear pair of bearings being near to but forward of said rear pair of rollers, said arm serving as a support for the forward end of said carriage when the carriage is moved outwardly of the recess to extend substantially beyond the recess of the cabinet.

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