March 11, 1952 R. M. PAUL 2,588,563

ROTARY SHELF REFRIGERATOR

Filed Feb. 25, 1949 2 SHEETS—SHEET 1

FIG 1

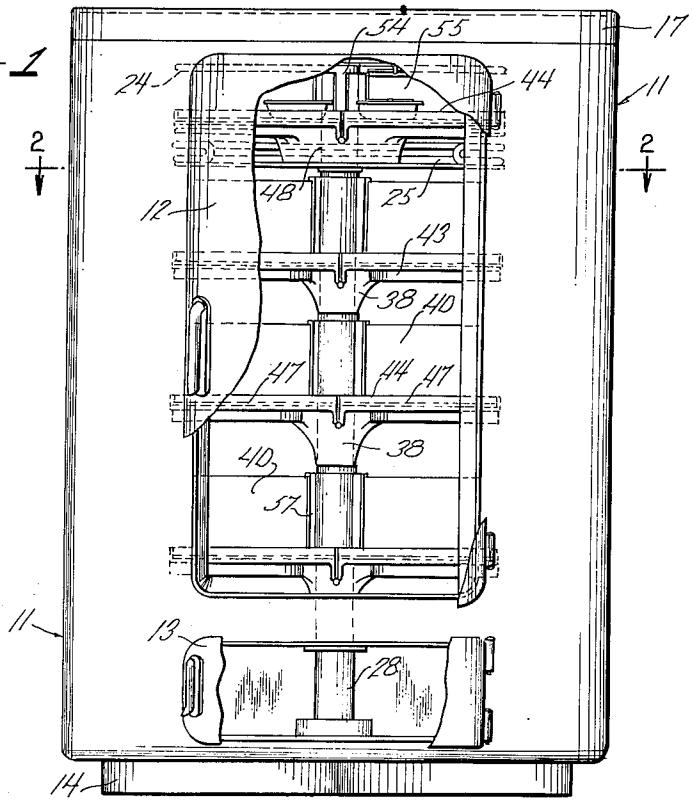
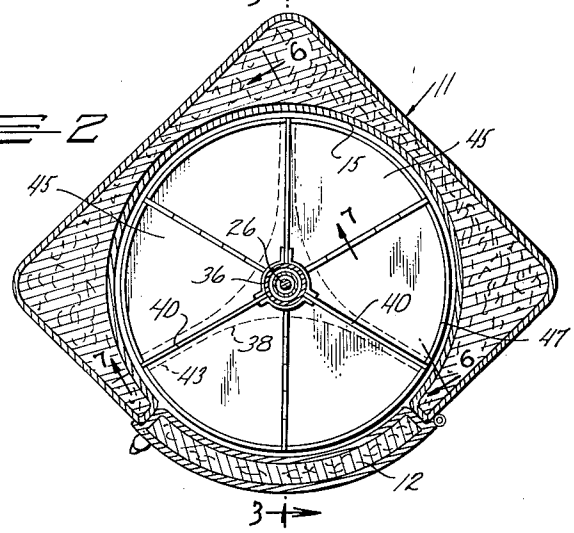


FIG 2



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ROTARY SHELF REFRIGERATOR

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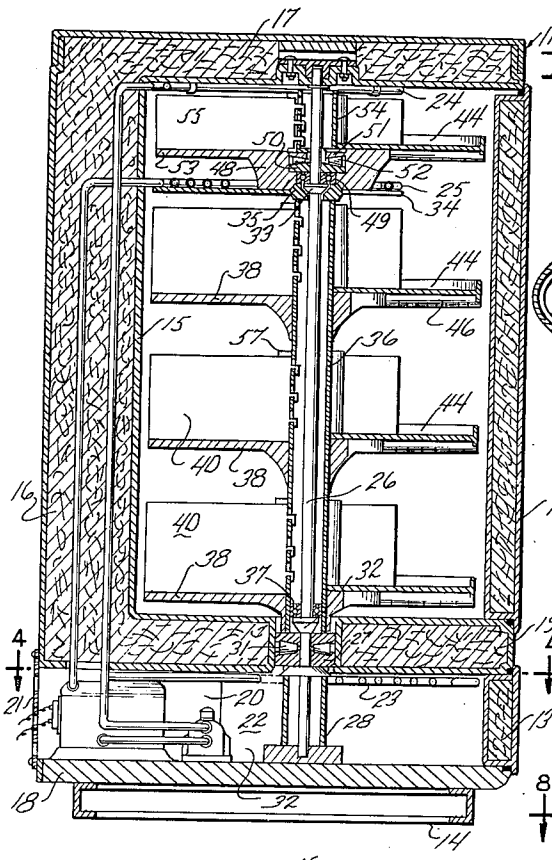


FIG 3

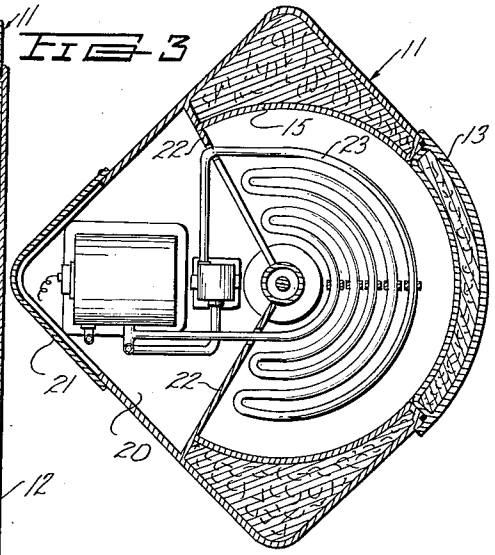


FIG 4

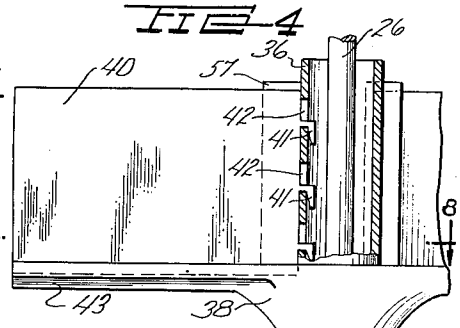


FIG 7

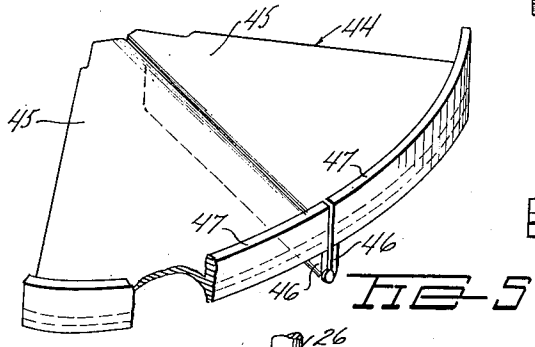


FIG 5

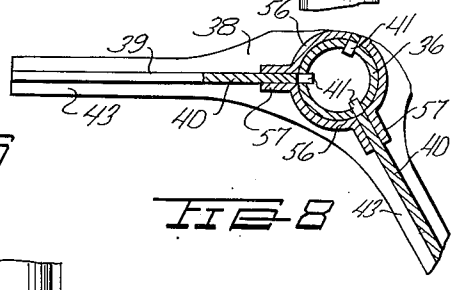


FIG 8

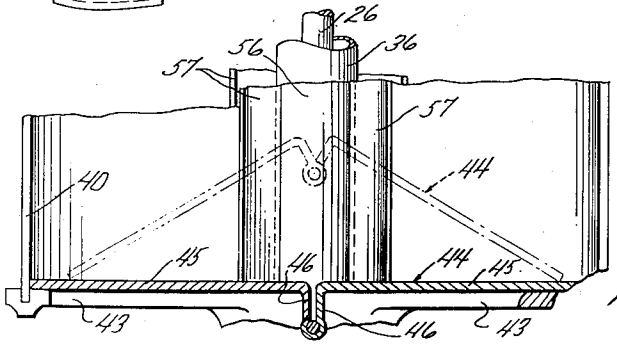


FIG 6

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ROTARY SHELF REFRIGERATOR

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Application February 25, 1949, Serial No. 78,449

5 Claims. (Cl. 62—89)

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This invention relates to refrigerators and more particularly to a refrigerator of the type having rotatable shelves.

A main object of the invention is to provide a novel and improved refrigerator of the rotary shelf type which is very simple in construction, compact in size, and particularly adapted to fit in a corner of a room.

A further object of the invention is to provide an improved rotary shelf refrigerator wherein the shelves are easily removable for cleaning and the like, wherein most of the cool air of the refrigerator is retained therein when the refrigerator door is opened, and wherein access to all parts of the refrigerator is readily obtained.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a front elevational view, with parts broken away, of a rotary shelf refrigerator constructed in accordance with the present invention.

Figure 2 is a horizontal cross-sectional view taken on line 2—2 of Figure 1.

Figure 3 is a vertical cross-sectional view taken on line 3—3 of Figure 2.

Figure 4 is a horizontal cross-sectional view taken on line 4—4 of Figure 3.

Figure 5 is an enlarged perspective detail view, partly broken away, of a foldable shelf section employed in the refrigerator of Figure 1.

Figure 6 is an enlarged cross-sectional detail view taken on line 6—6 of Figure 2.

Figure 7 is an enlarged cross-sectional detail view taken on line 7—7 of Figure 2.

Figure 8 is a cross-sectional detail view taken on line 8—8 of Figure 7.

Referring to the drawings, 11 designates the refrigerator cabinet, said cabinet being substantially square in plan, but being rounded off at its front corner, so that when fitted into the corner of a room, the front of the cabinet has a substantially quarter-round contour. The rounded front wall portion of the cabinet is provided with the main vertically elongated, vertically hinged door 12 and with a smaller vertically hinged door 13 below the main door 12, providing access to the lower portion of the cabinet. The cabinet 11 is mounted on a suitable base 14.

The upper main body of cabinet 11 is provided with a cylindrical internal wall 15, the space between said internal wall and the outer shell of the cabinet being filled with heat insulating material 16. The cabinet has a horizontal top wall

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17 and a horizontal bottom wall 18 resting on the base 14. The interior of the cabinet includes a horizontal insulated partition wall 19 defining a lower space 20, access to space 20 being had at its forward portion by opening door 13, and at its rear portion by removing a detachable cover plate 21 provided at the rear lower corner portion of the cabinet. The refrigerator motor, compressor and other mechanical components are located in the rear portion of space 20, as shown in Figures 3 and 4. The forward portion of space 20 is separated from said rear portion by vertical partition walls 22 and contains evaporator coils 23. Said forward portion is employed as a deep-freeze space.

The upper portion of the main storage space of the cabinet 12 contains spaced horizontal evaporator coils 24 and 25.

Secured axially within the cabinet cylindrical internal shell 15 and fastened respectively to the top and bottom walls 17 and 18 thereof is a vertical shaft 26. The lower portion of shaft 26 has secured thereto a collar 27 and surrounding the shaft beneath said collar is a sleeve 28. Supported on collar 27 is a lower bearing race 29 encircling the shaft. Designated at 30 is an upper bearing race encircling the shaft, and interposed between the bearing races 29 and 30 are the radial roller bearings 31. Above the race 30, shaft 26 carries a collar 32. At its upper portion shaft 26 is provided with another collar 33. Designated at 34 is a horiozntal plate member provided with an annular seat 35 through which shaft 26 passes and within which the collar 33 is rotatively received. Rigidly secured to annular seat 35 and depending therefrom is a vertical sleeve 36 which surrounds shaft 26 and bears at its bottom end on the upper bearing race 30. Interposed between the lower portion of sleeve 36 and shaft 26 is a roller bearing unit 37. Sleeve 36 is therefore freely rotatable around shaft 26.

Rigidly secured to sleeve 36 are a plurality of vertically spaced tray supports 38, each tray support having a hub portion and three radial arms 43 projecting radially from the hub portion and separated by angles of 120°. The arms 43 are formed with grooves 39. Secured to the sleeve 36 are spaced brackets 56 having vertical flanges 57. A pair of flanges 57 is aligned with each groove 39. Received respectively in the grooves 39 and between the flanges 57 are the respective bottom and inner vertical margins of vertical radial partition plates 40, said plates being provided at their inner vertical edges with spaced hooks 41 which are lockingly received in vertical slots

42 formed in the sleeve 36. The plates 40 may be removed by lifting them upwardly out of the grooves 39 and then moving them radially outwardly to disengage the hooks 41 from the slots 42.

Supported on the arms 43 between adjacent partition plates 40 are the shelf sections 44, each shelf section comprising a pair of equal segments 45, 45 formed with depending inner radial flanges 46, 46. The flanges 46, 46 are hinged together at their lower edges, so that the shelf sections may be folded upwardly, as shown in dotted view in Figure 6, enabling the shelf sections 44 to be readily removed for cleaning. The segments 45 are formed at their arcuate outer margins with upstanding flanges 47 which acts as retaining ribs to prevent food articles from rolling or sliding off the shelf sections.

Encircling the top portion of shaft 26 is a tray support 48. Tray support 48 is rotatably mounted with respect to both shaft 26 and seat 35. A roller bearing unit 49 is interposed between tray support 48 and shaft 26, as shown in Figure 3. Above unit 49, shaft 26 has secured thereto a bearing collar 50. Rigid with tray support 48 is an annular bearing flange 51 overlying collar 50. Roller bearings 52 are interposed between flange 51 and collar 50. Tray support 48 is therefore freely rotatable with respect to shaft 26.

Tray support 48 is provided with three equally spaced grooved radial arms 53 and has secured thereto the upstanding axial sleeve 54. Partition plates 55 are received in the grooves of arms 53, said plates being formed at their inner edges with vertically spaced hooks lockingly engaged in vertical slots formed in sleeve 54 in the same manner in which the hooks 41 are engaged in the slots 42. Partition plates 55 are therefore removable in the same manner as plates 40. Supported on the arms 53 between adjacent partition plates 55 are hinged shelf sections 44.

The upper shelf sections in the cabinet are located between the evaporator coils 24 and 25, as shown in Figure 3. These upper sections are employed to support ice cube trays, and the like. The remaining shelf sections are employed to support various food articles.

To reach any desired article, the shelf section on which it is carried is rotated into view adjacent the front of the cabinet. It will be noted that when the cabinet door is opened, only the front shelf sections are exposed, the rear sections being shielded by the vertical partition plates 40 and 55. Thus, in placing food in the refrigerator or in removing articles from frontal shelf sections, wherein rotation of the shelf sections is not necessary, the cold air in the rear two thirds of the cabinet is prevented from escaping to any substantial degree when the door 12 is opened. As shown in Figure 2, the door 12 is slightly less in width than the width of a shelf section.

While a specific embodiment of a rotary shelf refrigerator has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A refrigerator cabinet comprising a housing having an external contour which has a vertical right angled corner at the intermediate portion of its rear wall and a vertical substantially quarter round front wall, whereby the housing may be fitted into a corner of a room, a vertical shaft secured within said housing, a sleeve member rotatably mounted on said shaft, a plurality of vertically spaced circular shelves secured to said sleeve member, said housing having an inner cylindrical shell extending coaxially adjacent the peripheral portions of said shelves, a pair of vertically spaced horizontal evaporator coils in the top portion of said shell, an additional circular shelf rotatably mounted on said shaft between said evaporator coils, and a vertically hinged door provided in said front wall and extending adjacent the shelves.

2. A refrigerator cabinet comprising a housing having an external contour which has a vertical right angled corner at the intermediate portion of its rear wall and a vertical substantially quarter round front wall, whereby the housing may be fitted into a corner of a room, a vertical shaft secured within said housing, a sleeve member rotatably mounted on said shaft, a plurality of vertically spaced circular shelves secured to said sleeve member, said housing having an inner cylindrical shell extending adjacent the peripheral portions of said shelves, a pair of vertically spaced horizontal evaporator coils in the top portion of said shell, an additional circular shelf rotatably mounted on said shaft between said evaporator coils, a plurality of upstanding vertical radial angularly spaced wall elements carried by the shelves, and a vertically hinged door provided in said front wall and extending adjacent the shelves, said door subtending a horizontal angle less than the angular spacing between adjacent wall elements.

3. A refrigerator comprising a housing having a substantially cylindrical inner wall vertically disposed and provided with an access opening extending longitudinally thereof, and upper and lower end walls disposed one at each end of said inner wall and providing a refrigerating chamber within said inner wall, a door hinged to said housing along one side of said access opening to close the latter, a shaft extending coaxially through said inner wall and secured at its ends to said end walls, a sleeve receiving said shaft and extending longitudinally thereof, bearing means rotatably supporting said sleeve on said shaft, tray supports mounted on said shaft at locations spaced apart longitudinally of the latter, sectional trays supported on said tray supports and removable therefrom through the access opening in said inner wall, partition plates removably mounted on said tray supports and extending radially from said sleeve at substantially equal angular intervals around the latter, the distance between the outer ends of adjacent partition plates being greater than the width of said access opening, and refrigerating means carried by said housing and including an evaporating coil disposed in said refrigerating chamber.

4. A refrigerator comprising a housing having a substantially cylindrical inner wall vertically disposed and provided with an access opening and upper and lower end walls disposed one at each end of said inner wall and providing a refrigerating chamber within the latter, a shaft extending coaxially through said inner wall and secured at its ends to said inner walls, a sleeve receiving said shaft and journaled thereon, tray supports secured to said sleeve at spaced apart locations therealong and each including a hub portion and arms projecting radially from said hub portion at substantially equal angular intervals therearound, each of said arms having a lon-

gitudinally extending groove in its upper surface and said sleeve having series of longitudinally spaced apart slots disposed one series at the inner end of each of said grooves, partition plates mounted on said tray support and each having its lower edge received in a corresponding groove and having hooks on its inner end releasably engaged in slots of the corresponding series of slots, the distance between the outer ends of adjacent partition plates being greater than the width of the access opening in said inner wall, tray sections disposed one between each two adjacent arms and supported at their edges on the latter, each of said tray sections including two segments hinged together along the mid-width location of the tray sections to facilitate removal of said tray sections from said supports through said access opening, refrigerating means disposed in said housing and including an evaporating coil disposed in said refrigerating chamber, and a door hinged to said housing along one edge of said access opening for closing the latter.

5. A refrigerator comprising a housing having a substantially cylindrical inner wall vertically disposed and provided with an access opening extending longitudinally thereof and upper and lower end walls disposed one at each end of said inner wall and providing a refrigerating chamber within the latter, a shaft extending coaxially through said inner wall and secured at its ends to said end walls, a first sleeve receiving said shaft and journaled thereon, tray supports secured on said first sleeve at spaced apart locations therealong and each including a hub portion and arms projecting radially from said hub portion at substantially equal angular intervals therearound, each of said arms having a longitudinally extending groove in its upper surface and said sleeve having series of longitudinally spaced apart slots disposed one series at the inner end of each groove, partition plates mounted on said tray supports and each having its lower edge received in a corresponding groove and having hooks on its inner end releasably engaged in the

slots of the corresponding series of slots, each of said partition plates extending from said sleeve substantially to said inner wall and the distance between the outer ends of adjacent partition plates being greater than the width of the access opening in said inner wall, tray sections disposed one between each two adjacent arms and supported at their edges on the latter, each of said tray sections including two segments hinged together along the mid-width location of the tray sections to facilitate removal of said tray sections from said supports through said access opening, a second sleeve mounted on said shaft between said first sleeve and the upper end wall and supporting an upper tray support, partition wall and sectional tray assembly for rotation independently of the corresponding assemblies mounted on said first sleeve, refrigerating means disposed in said housing and including evaporating coils disposed in said refrigerating chamber one at each side of said upper assembly, and a door hinged to said housing along one side of said access opening for closing the latter.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
874,933	Bristow	Dec. 31, 1907
964,900	Conroy	July 19, 1910
1,018,180	Gallagher	Feb. 20, 1912
2,091,292	Scurlock	Aug. 31, 1937
2,095,655	Vlcek	Oct. 12, 1937
2,115,343	Scurlock	Apr. 26, 1938
2,139,441	Clarke	Dec. 6, 1938
2,239,734	Pratt	Apr. 29, 1941
2,400,135	Quinn	May 14, 1946
2,484,894	Lindsay	Oct. 18, 1949
2,498,028	Clerc	Feb. 21, 1950
2,507,834	Storer	May 16, 1950