April 18, 1944. W. J. DRUCKER 2,346,914

REFRIGERATED DISPLAY CABINET

Filed June 16, 1941 2 Sheets-Sheet 1

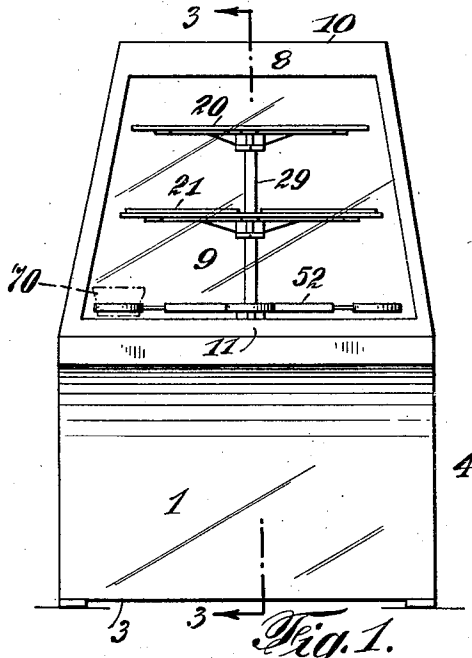


Fig. 1.

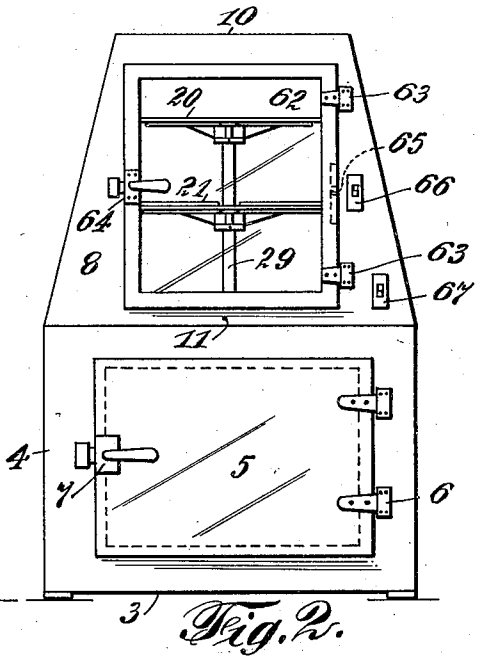


Fig. 2.

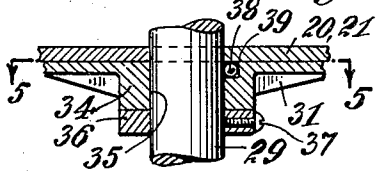


Fig. 6.

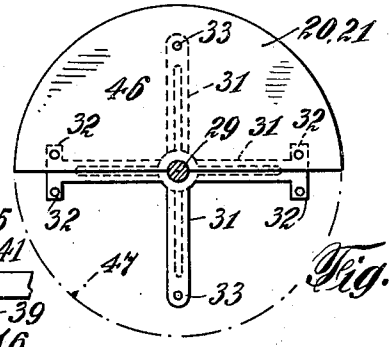


Fig. 7.

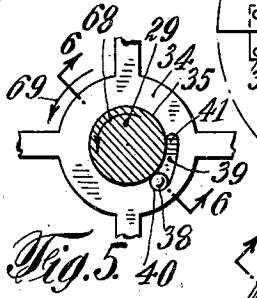


Fig. 5.

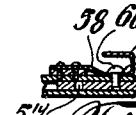


Fig. 11.

Fig. 10.

Fig. 9.

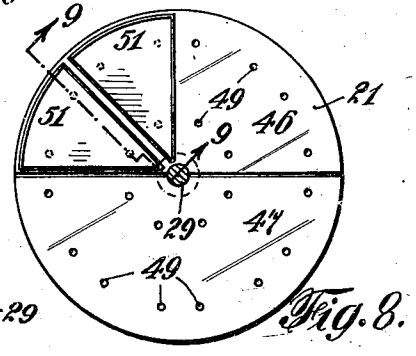


Fig. 8.

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REFRIGERATED DISPLAY CABINET

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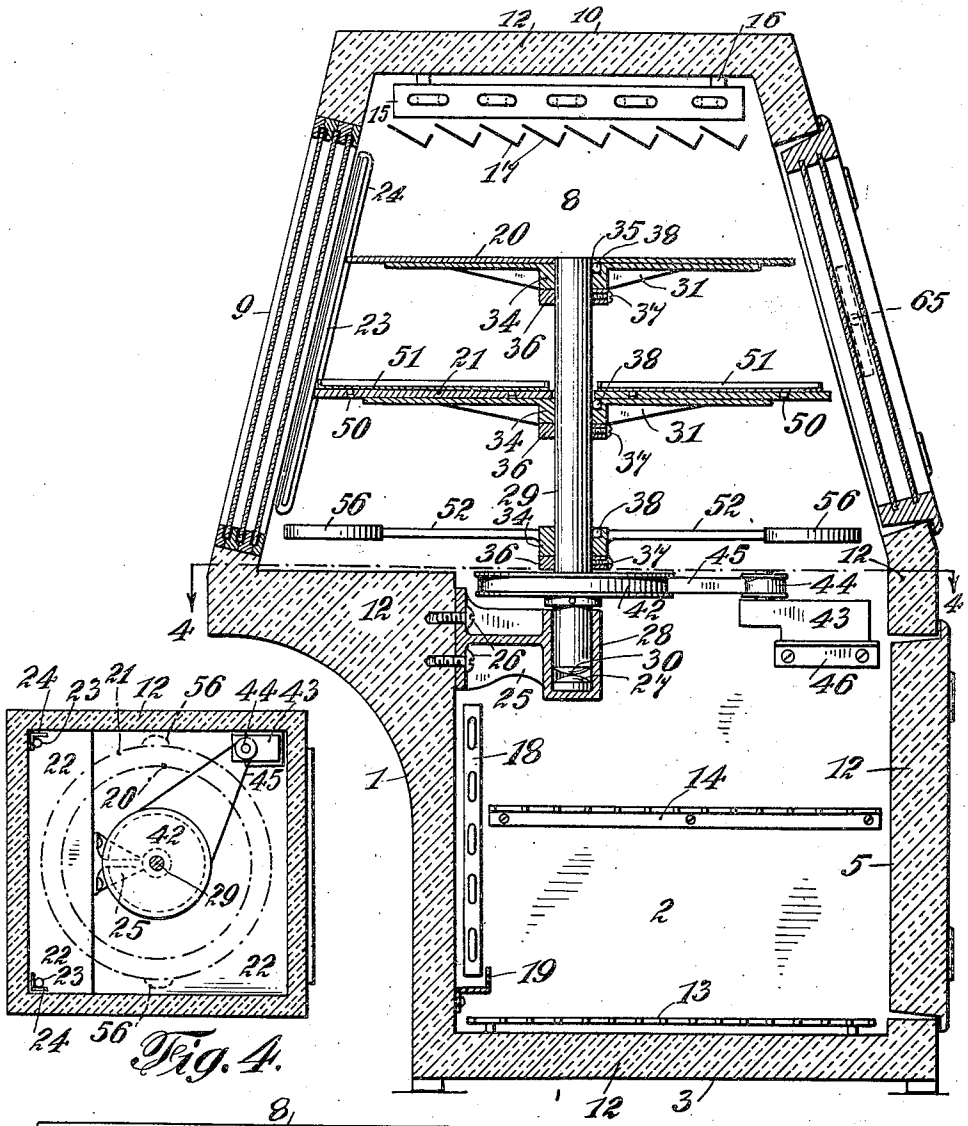


Fig. 3.

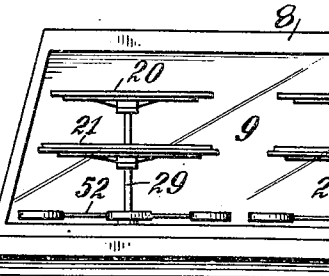


Fig. 4.

Fig. 12.

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UNITED STATES PATENT OFFICE

2,346,914

REFRIGERATED DISPLAY CABINET

William J. Drucker, Richmond Hill, N. Y.

Application June 16, 1941, Serial No. 398,191

1 Claim. (Cl. 62—89.5)

This display refrigerator relates to improvements for the accommodation of various kinds of perishables displayed on revolvable turntables or display members. The refrigerator cabinet is improved as to the display section, accessibility for servicing and improved and simplified mechanical details of the turntables, display means and mechanism.

Another object is the enhancement of air conditioning and sanitary features by stationary cooling coils in conjunction with the turntable arrangement. A further object is the elimination of wasted shelf space occurring in ordinary refrigerated display cases and to concentrate goods in an effective display and storage unit in a smaller area and incorporating at the same time a more efficient illumination than heretofore.

Another object of the invention is to provide a moving part display refrigerator, in which the round turntable arrangement cooperates especially with a casing of novel and improved features to enhance vision and effective survey of the display in continuous need of artificial illumination.

Other objects of the invention reside in the novel details of construction, combination and arrangement of parts fully set forth in the following description, in connection with the accompanying drawings, and as particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a front elevation of the preferred embodiment of the refrigerated display cabinet.

Fig. 2 is a rear elevation of the same.

Fig. 3 is a central vertical section taken on the line 3—3 of Fig. 1 to an enlarged scale.

Fig. 4 is a reduced cross-section on the line 4—4 of Fig. 3.

Fig. 5 is a detailed view of the clutch arrangement on the line 5—5 of Fig. 6.

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

Fig. 7 is a plan view of the upper turntable.

Fig. 8 is a plan view of the intermediate turntable.

Fig. 9 is a detailed section taken on the line 9—9 of Fig. 8.

Fig. 10 is a plan view of the spider and display support of the lower rotatable member.

Fig. 11 is a detailed section taken on the line 11—11 of Fig. 10.

Fig. 12 is a front elevation of a modification of the refrigerated display cabinet with the display assembly in duplex arrangement.

In the drawings, in which like numerals of reference designate like parts throughout, referring to Figs. 1, 2, and 3, the storage cabinet 2, has a lower front wall 1, and a rear wall 4, having a door 5, hinged as at 6, and having a lock 7. The upper or display section 8, is shown integral with the lower storage cabinet 2, and shows inserted in the front a glazed display section 9, made of multiple glass panes properly spaced and sealed for insulation. This display section is of the unit type of my Patent No. 2,129,996 issued September 13, 1938.

Display section 8 is substantially square in plan, the display section walls tapering in upward direction pyramidically towards the center of the display section, the top 10 being therefore of smaller dimensions than the base portion 11 of same. The needed insulation material 12, is provided in the refrigerator walls.

In the storage section 2 are the bottom rack 13, and the intermediate shelf 14.

In the display section a finned flash-cooling coil 15, is hung on hangers 16, with flash-drip pan 17, mounted on the inside top portion of the display section 8. Another coil 18, with drip pan 19, is provided in the lower storage section 2.

The turntable tops 20 and 21 in Fig. 4 are of circular shape in a square refrigerator cabinet. Especially large air channels 22 are created adjacent the periphery of the turntables in the corners of the display section. An elongated or slender cold cathode fluorescent light 23, with a reflector 24, is placed one each in a nearly vertical position in the two front corners, i. e. left and right inside the display section 8. A bracket 25, mounted on the inside of wall 1 by stud bolts 26, serves to support the turntable assembly.

The bearing 28 of said bracket journals spindle 29 whose rounded end 30 rests on the similarly rounded stop 27. Turntable tops 20 and 21 are mounted, as shown in Fig. 7, in two halves 46 and 47 upon spider bracket 31, having four evenly spaced radial arms. Two opposite arms have bracket ends shaped as extending lug T-portions 32, permitting fastening of the half tops 46 and 47, as indicated at 32. The other two arms support the same half tops held in place as at 33. All half tops are fastened by dowel pins. The spider hub 34 with its bearing portion 35 is shown resting upon collar 36, which is held in place integral with spindle 29 by set screw 37.

A steel ball 38 is shown in the ball socket 39 of hub 34. Ball socket 39 has a wide portion at 40 and a narrow portion at 41. Said socket is curved to be nearly, but not quite, parallel to the periphery of spindle 29, and is open on the side towards the spindle, the socket width gradually

diminishing towards its end 41. While the particular friction drive shown is preferred and illustrated by way of example, still it is not intended to exclude any equivalent means that permits any individual display top to be either stopped or turned by hand without interfering with the motion of the other tops.

A pulley 42 is fixed on spindle 29 preferably just clear of the upper end of bearing 28. This pulley is rotated by means of a geared electric motor 43, mounted upon stationary bracket 46, through pulley 44 and belt 45. While a cantilever bracket has been shown by way of example, the invention is not limited to this to the exclusion of any equivalent means for supporting a continuously rotating vertical shaft having one or more display tops.

It is noticed that the upper turntable platform 20 has a flat surface. This is provided for the display of packaged goods and the like calling for such support. The intermediate turntable platform 21 is suited for a different type of goods, i. e. carried by dishes which must be securely held, and is provided with spaced holes 49, to receive corresponding lugs 50 on the underside of the bottom of the sectoral trays 51.

Hub 34 of the lower revolvable display member, Fig. 10, is substantially the same as hub 34 of the upper two turnables. By way of example, there is shown four bracket supports extending from the hub 34, two of which are indicated as solid and stationary, namely 52, and two of which, 53, have hollow sleeves. This arrangement allows each bracket member 54 to be shifted in or out, to respectively extend or decrease the radius of its receptacle rim 56, which is carried by member 54. A deep dish 70, in Fig. 1, depicts one of the applications in the use of rim 56. Stationary brackets 52 also hold rims 56 at their outer ends. A plurality of equally spaced holes 57, in member 54, line up with a corresponding hole 59 in the bracket support 53. By means of a spring clip 58, fastened to bracket 53, pin 60 can be made to engage any of holes 57, and simultaneously the corresponding bracket hole 59, by handling clip handle 61 which is biased to press against the surface of bracket 53, clip handle 61 thus serving to keep the pin 60 from being lost.

Fig. 2 shows the rear of the refrigerator with a display section door 62 hinged as at 63 with lock 64. Door 62 is glazed for transparency. An automatic electric switch 65, wired to electric motor 43, is so arranged on the sash of door 62 that the electric current is "on" when the door 62 is closed, and "off" when door 62 is opened. Electric switch 66 is wired to the motor 43, to cause the switch 65 to control the motor 43 when switch 66 is in a central position, and, regardless of the position of the door 62, to cause the motor to run continuously in one extreme position of switch 66. In the other extreme position of switch 66 the circuit is open and the motor 43 stops. Electric switch 67 is for the fluorescent lights 23. Electric wiring for the switches 65, 66 and 67 is conventional and hence not shown in the drawings.

A modification is depicted in Fig. 12 showing the front of the display refrigerator generally as in Fig. 1, but includes a greater display capacity in a single cabinet, the mechanical display assemblies being arranged in duplex.

Having thus described the structural and mechanical features of this refrigerated display cabinet, its operation is as follows:

The electric motor and pulley assembly slowly revolves spindle 29 in the direction indicated by arrow 68. This action will cause steel ball 38 to be urged in the same direction to clutch and frictionally engage spindle 29 with hubs 34 on all of the display supports, to revolve them also. The revolutions of the display assembly are very slow, e. g. 1–3 R. P. M.

Therefore the clutch arrangement allows any of the turntables to be revolved manually by the attendant through service door 62, ahead of the speed of spindle 29, by grasping the rim of any of the turntables or bracket members such as the lower display member disclosed, and turning the same faster in the direction of arrow 69, i. e. in the same direction as the spindle, as shown by arrow 68, but faster. The action just described occurs when switch 66 is in use. However in the central position of switch 66 the motor stops when the door 62 is opened and the attendant then manually turns the desired hub in the same direction as it had previously been turned by the motor.

In either case, this will release clutch ball 38 from its clutch grip. It is understood that the end space 40 of socket 39 is of a width radially (with respect to spindle 29) which is slightly in excess of the diameter of steel ball 38.

Through the afore-mentioned manipulations, ball 38, being held in said space 40, is kept inactive as to its clutching function and a free revolving of its turntable in the same direction and at a greater speed than that of the spindle is made possible. This arrangement enables the attendant to have access to any of the displayed articles with less waste of time than if he had to wait for the desired article or dish to be brought around to the service door by the motor.

It is obvious that the clutch mechanism can be eliminated in hubs 34 of the turntables in case an individual turntable clutch and release method, such as this arrangement provides, is not wanted. The turntable hub would in this case be fixed upon spindle 29, or the clutch and release feature might be incorporated in the hub of pulley 42 (not shown) in the same manner as detailed here in hub 34.

Turntable tops 20 and 21 are each made in two sections 46 and 47 and assembled as shown in Figs. 7 and 8 for the purpose of installation or removal through door 62.

Sector trays 51, dish shaped as indicated, are for the purpose of receiving goods of a moist or wet nature. The trays, placed on top of a turntable preferably cover the same completely, being sectorally shaped to accomplish this end. They are securely held in position by the arrangement of holes 49 and the co-acting lugs 50, or by any other equivalent arrangement, otherwise the vibrations of a revolving turntable might cause them to slide off and fall.

The lower revolvable display assembly, Fig. 10, with its receptacle rims, stationary and telescoping brackets, is used for the purpose of holding deep dish receptacles of moist or wet contents, to be securely displayed in this manner.

The inclined to the vertical channels 22 in the corners of the display section are created for the source of illumination. By utilizing the relatively cold light of elongated fluorescent tubes and efcient reflectors of similar shape and locating them in these corners, the entire display case is attractively illuminated and all dark spots or cross-shadows are eliminated.

The display cabinet of Fig. 12 evidences its merit in view of the foregoing. Where a larger

quantity of space for display and storage is wanted, such a display cabinet constructed according to the principles of this invention will be used with a plurality of revolvable display assembly units, as indicated. While one and two revolvable display assembly units have been shown by way of example, a larger number may be used, as desired, in a single refrigerated cabinet.

The disclosures as outlined show a most practical display refrigerator substantially of square shape with turntable improvements. Of course the mechanical refrigeration unit, i. e. the compressor and condenser, are not included within the cabinet. The cabinet is constructed with particular view of accommodating the turntable assembly, display and dispensing means, in connection with an efficient lighting method. The positive clutch action, enclosed in hubs, and the elimination of all external structural features which might offer obstruction, or whose function might be interfered with by the display or handling, is important in practice. A variety of holding means for the various kinds of perishables to be displayed is well provided for. Air channels 22 are of importance in facilitating the air circulation past the stationary cooling coils.

The cooling coils 15 and 18 tend to set up a thermal circulation, but the colder air has a tendency to collect in the lower portion of the cabinet instead of being used to keep the temperature uniformly cool throughout both sections as is desirable. The rotation of the display assembly stirs up the air and sets up a positive common circulation in both sections, since they are connected by a large opening. The channels in the corners, where a rectangular cabinet is used, are especially efficient in entraining the cold air from cooling coil 15 and thoroughly mixing it with the rest of the air in both sections.

The coils of the unit type are so arranged that unsanitary dripping therefrom onto the revolving display assembly can not occur.

It is understood that the coil units may be incorporated in the walls of this refrigerated cabinet instead of exposed on the interior as shown here. While such coil units enclosed in the walls are not shown here, they are of the conventional type, and especially desirable in instances where temperatures below the freezing point are wanted, as for instance for the display of frosted perishables and the like.

It is understood that I do not wish to be limited to the specific details of construction shown or described, so long as either the structure or combination of elements comes within the terms of the appended claim.

I claim:

A refrigerated display cabinet comprising the combination of a refrigerated casing having a display and storage sections and a cooling coil unit stationary in at least one of the sections and at least one display assembly in said display section, said display assembly comprising a plurality of display turntables, a spindle rotatably secured to said casing with its axis of rotation vertical, an electric motor and driving means connecting the motor with the spindle to slowly turn the spindle in one direction, a circuit of said motor including a switch means operated by said door to automatically open when servicing the refrigerated cabinet, to then stop said motor and to automatically close when the servicing is complete, to cause said motor to then run, hubs mounted revolvably in predetermined axially spaced positions upon the spindle, clutch means to rotatably drivingly engage the spindle to the hub and effective upon the turning of the spindle in said direction, said clutch means being releasable to disengage the spindle from each hub by manually turning the hub in the same direction, a plurality of brackets radially attached to said hubs, and at least one display supporting means attached to each of said brackets, the arrangement providing extended air channels adjacent to portions of the path of the outer end of said display supporting means, to enhance the air circulation within the refrigerator cabinet.

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