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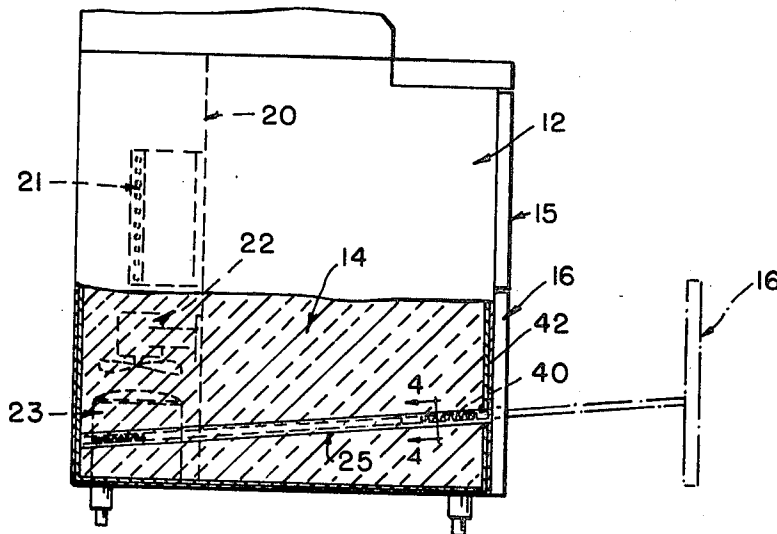
[54] **DRAWER CONSTRUCTION FOR A
REFRIGERATOR, CABINET OR OTHER
ENCLOSURE**
13 Claims, 5 Drawing Figs.

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ABSTRACT: An insulated refrigerating cabinet enclosure of a sliding door or drawer type has spring biased tubular return rod units, each including an elongated tubular housing and a spring biased return rod, connected at their ends to opposite sides of the drawer and enclosure, respectively. These units extend front to rear, and at a slight angle to the vertical, through the well-insulated side walls of the enclosure or cabinet. Each housing tube is fixedly connected at its rear to and within the wall, and the return rod is similarly connected at its front to the forward drawer closure; and antifriction bearings guide the rod for longitudinal slide in the tube. A coil spring encircles each rod adjacent the rear of the latter, abutting rearwardly against a fixed stop shoulder, so that when the drawer and its return rods are fully extended by a user the spring abuts forwardly against fixed stop means, thereby storing up spring energy. This will commence the rearward return of the drawer when such return is desired and the drawer is accordingly released by the user.



DRAWER CONSTRUCTION FOR A REFRIGERATOR, CABINET OR OTHER ENCLOSURE

BACKGROUND OF THE INVENTION - FIELD

The invention finds application in the field of refrigerated cabinet constructions of the sliding drawer type in which, in the interest of maintaining optimum efficiency of a refrigerating unit ordinarily associated with such cabinetry, it is desirable that the open topped interior of the enclosure be left exposed as little as possible, *i.e.*, only when the immediate access to the interior is being had. The idea of the invention is equally adaptable to pivotal door-type tray or like units.

As for the specific nature of the cabinet structure, the aim of the invention is not at all limited; that is, it may be a service unit providing its own laminated maple or other top service shelf, or it may be an under-counter unit. Applications to restaurant and self-service chilled food dispenser units are contemplated; as are application in food establishments purveying partially or wholly prepared solid frozen products, dairy products, meats and the like.

I am unaware of any prior art dealing directly with the type of sliding or equivalent drawer cabinet constructions such as are contemplated by the invention.

SUMMARY OF THE INVENTION

In accordance with the invention a sliding drawer type of cabinet enclosure, including an open topped drawer appropriately guided for its action in an insulated casing or the like, has a pair of like elongated tubular, spring-type guide and return units disposed adjacent the sides of the drawer. An important feature of the invention is that these units extend front-to-rear through the usual hollow and well-insulated side walls of the cabinet proper, so as to prevent freezing of any condensate within or about each unit during the life of the installation, such as might detract from the efficiency of its operation. Each of the two units includes an elongated outer guide tube which is fixedly connected at its rear to the cabinet structure proper, and an elongated inner sliding rod connected its forward end to the forward closure panel. The rod is guided for minimal frictional resistance to sliding action in the tube by means of fixed, longitudinally spaced bearings within and adjacent the forward end of the outer tube; and the rear end of the rod has a stop abutment, adjacent which a fairly short coil compression spring abuts rearwardly and is adapted to react.

The rod and tube units are preferably disposed at a slight upwardly and forwardly inclined angle, so that the return of the slidable component will normally be primarily under the influence of gravity; however, when the sliding drawer structure is fully retracted or withdrawn forwardly, the springs are ultimately compressed axially, in engaging suitable forward stop means in the tubes. They are thereby preloaded, to an extent dependent on the free length and rate of the springs, to be capable of commencing the rearward return of the slidable drawer components, when access to the interior of the cabinet is no longer desired and the drawer is manually released. These arrangements ensure that the open-topped sliding structure is left exposed no longer than is absolutely necessary, lending to a minimum loss of refrigerating efficiency of the installation as a whole.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a drawer-type refrigerated cabinet or related enclosure such as is contemplated by the invention;

FIG. 2 is a fragmentary side elevational view, as from the arrow 2 of FIG. 1, being partially broken away and in vertical front-to-rear section to illustrate a relationship of the return rod and tube units to the insulated interior of the side cabinet walls;

FIG. 3 is a somewhat enlarged scale view, partially broken away, in vertical axial section through one of the tubular guide and return units;

FIG. 4 is a fragmentary view in transverse vertical section on line 4-4 of FIG. 2 and 3; and

FIG. 5 is a view in vertical transverse cross section on line 5-5 of FIG. 3.

DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. 1 illustrates a typical refrigerated enclosure or cabinet structure, generally designated 10, to which the improvements of the invention are applied, although as indicated above, many different other specific types of installations are in contemplation. As shown, the structure 10 includes hollow side walls 12, 13 which are well insulated throughout the height, width and depth or breadth thereof (FIG. 4) by a known type of thermal insulation 14. In the embodiment illustrated in FIG. 1 the enclosure structure 10 includes slidable top and bottom drawers 15 and 16, respectively, which may be considered to be structurally the same, although not necessarily so. As illustrated, these drawers each include side walls 17 appropriately guided by cabinet walls 12, 13 for a minimum friction sliding action within the same, a suitable bottom, and a front closure panel 18, which will in most installations be appropriately insulated internally, like the cabinet side walls 12, 13.

As indicated in dotted line in FIG. 2 the rear portion of the cabinet enclosure, as separated from the forward portion by an appropriate upright partition 20, will house the usual components of a conventional small refrigerating system, including a refrigerant circulating evaporator 21, an air circulating fan or blower 22 and a unit 23 housing the remainder of the refrigerating system, such as compressor, condenser, etc.

The reference numeral 25 generally designates an elongated drawer guide and return unit according to the invention of which there are preferably two in each installation, each acting within one of the two internally insulated side walls 12, 13 of cabinet structure 10. FIG. 4 shows these units as extending through, and well packed into, the wall insulating material 14, with the result that a freezing of condensate within the guide unit 25 cannot take place, such as might interfere with a proper, friction-free action of that unit, or the other sliding drawer provisions with which it is associated.

The control and return unit 25 comprises a considerably elongated external housing tube 26 of cylindrical cross section, preferably formed of a noncorrosive material, such as aluminum tubing. The tube 26 internally receives concentrically an elongated guide and return rod 28, shown as being of only a bit less length than the tube. Desirably, the rod is of one-half O.D. solid section steel, appropriately heat treated and chromium finished or otherwise treated to resist wear and corrosion. The tubes 26 are suitably secured at their rear in respect to the rear of the respective cabinet walls 12, 13 as by means of apertures 29 in the tubes for the purpose; and plugs 30 seal the tube rear ends.

As seen in FIG. 3, each rod 28 is shouldered adjacent its rear end to receive a thrust washer 32, held in place by a castellated and pinned nut 33; and a coil compression spring 34 abuts rearwardly against washer 32 as a backstop. The free length of spring 34 may be chosen as desired, as may be its spring force as will appear. It will not, however, be forwardly restrained in the free condition of unit 25, which appears in FIG. 3.

Guide tube 26 is provided adjacent its forward end (right hand as viewed in FIG. 3) with a first bearing 36 of a known type which abuts forwardly against, and is thereby stopped by, a spun-in end shoulder 37 on tube 26. A second similar bearing 38 is spaced axially to the rear of bearing 36, abutting against and being stopped by an annular shoulder 39 rolled radially inwardly in tube 26. An elongated compression spring 40 surrounds the return rod 28, as slidably guided by bearings 36, 38, thus maintaining these bearings in proper axial spacing, yet enabling a very inexpensive assembly of the bearings and rod in the tube. The forward end of each external guide tube 26 is fairly loosely received within an opening 41 in the front upright panel facing 42 of a side wall 12 or 13 of cabinet

10; and the return rod 28 of each unit 25, projecting to the right from its tube 26, is appropriately secured to the front slidable closure panel 18, as through the agency of an appropriate opening 43 in the rod.

FIGS. 3 and 5 illustrate structural features of the like bearings 36, 38. As indicated above, the invention claims no novelty in such an antifriction device, per se, although their ball bearing efficiency lends considerably to the reliable operation of the tube units 25. Each of bearings 36, 38 comprises an outer shell 45 in fixed relation to tube 26, which shell bears four radial depressions 46 spaced circumferentially equally from one another, and an inner shell 47 which acts as a cage for four series of antifriction balls 48. The latter travel orbitally in retainer slots of shell member 47, through which they are exposed for rolling engagement with the rod 28, in the manner indicated in FIG. 5, as the rod slides axially within tube 26. The efficiency of this type of bearing structure complements the protection afforded the guide and return tube units 25 in attaining a long life of proper performance under conditions which are usually less than the best.

I claim:

1. A refrigerator-type structure having a cabinet interior defined by at least one hollow side wall affording a space between wall panels thereof, a unit mounted for retractile and return movement out of and into said cabinet interior, and guide and return means assisting in the guiding of said unit for said movement, comprising an elongated tube extending longitudinally through said wall panel space and secured to the cabinet, an elongated rod slidable in said tube and connected to said unit at a point remote from the securement of said tube to the cabinet, bearing means guiding said rod for movement in the tube, and spring means adapted to act between said rod and a fixed part of said guide means to come under compression when said unit is predeterminedly retracted outwardly in relation to the cabinet interior.

2. A refrigerator-type structure having a cabinet interior defined by at least one internally hollow side wall provided with insulating material filling a space between wall panels thereof, a unit slidably mounted for retractile and return movement out of and into said cabinet interior and having a forward closure member for at least a part of the cabinet, and guide and return means assisting in the guiding of said unit for said sliding movement, comprising an elongated tube extend-

ing longitudinally through said wall panel space and said insulating material and secured to the cabinet adjacent the rear of said wall, an elongated rod slidable in said tube and connected to said closure member of said unit, bearing means guiding said rod for movement in the tube, and spring means adapted to act between said rod and a fixed part of said guide means to come under compression when said unit and its closure member are predeterminedly retracted outwardly in relation to the cabinet interior.

3. The structure of claim 1, in which said spring means comes under compression directly to the rear of said bearing means.

4. The structure of claim 2, in which said spring means comes under compression against a part of said tube directly to the rear of said bearing means, said tube part rearwardly sustaining an element of said bearing means.

5. The structure of claim 3, in which said bearing means comprises front-to-rear spaced bearing elements in said tube, in which elements the rod is guided for movement.

6. The structure of claim 4, in which said bearing means comprises front-to-rear spaced bearing elements in said tube adjacent the forward end of the latter, in which elements the rod is guided for sliding movement.

7. The structure of claim 4, in which said bearing means comprises front-to-rear spaced bearing elements in said tube adjacent the forward end of the latter, in which elements the rod is guided for sliding movement, the rearmost of said elements being rearwardly sustained by said tube part.

8. The structure of claim 5, in which said bearing elements are urged and spaced away from one another by further spring means in the tube.

9. The structure of claim 6, in which said bearing elements are urged and spaced away from one another by further spring means in the tube.

10. The structure of claim 7, in which said bearing elements are urged and spaced away from one another by further spring means in the tube.

11. The structure of claim 4, in which said sustaining tube part comprises a radial indentation in said tube.

12. The structure of claim 7, in which said sustaining tube part comprises a radial indentation in said tube.

13. The structure of claim 10, in which said sustaining tube part comprises a radial indentation in said tube.

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