Aug. 7, 1962 W. G. FISHER 3,048,462

CABINET STRUCTURE

Filed Sept. 24, 1959 2 Sheets-Sheet 1

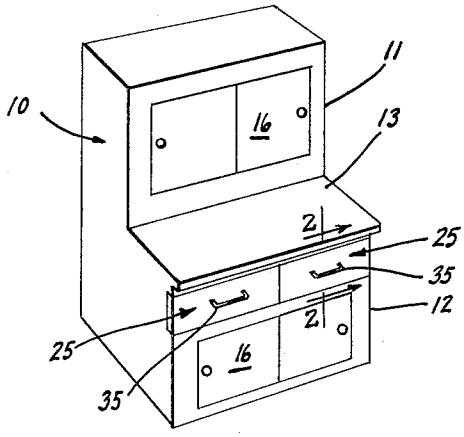


FIG. 1.

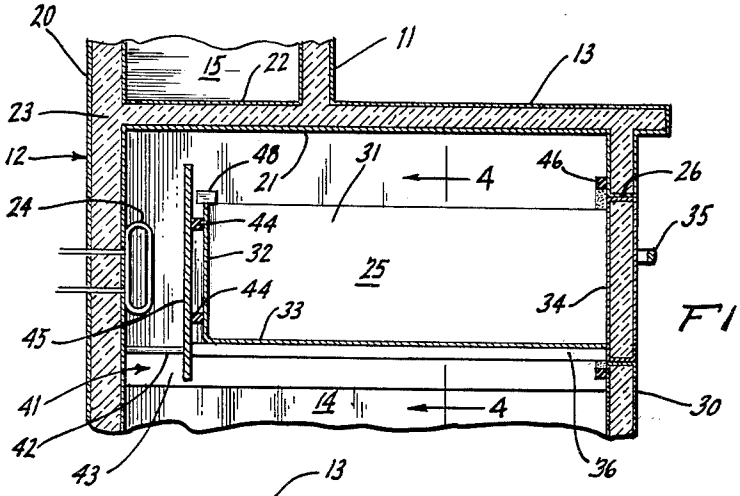


FIG. 2.

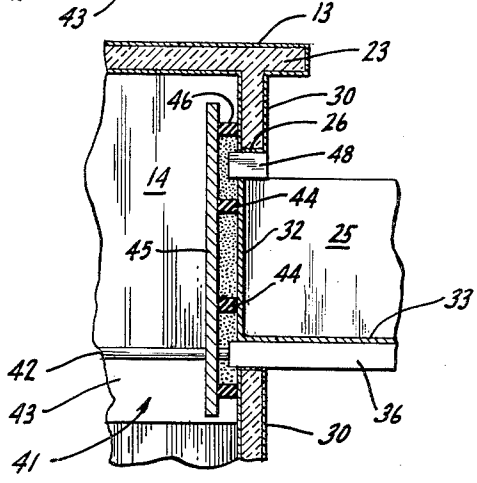


FIG. 3.

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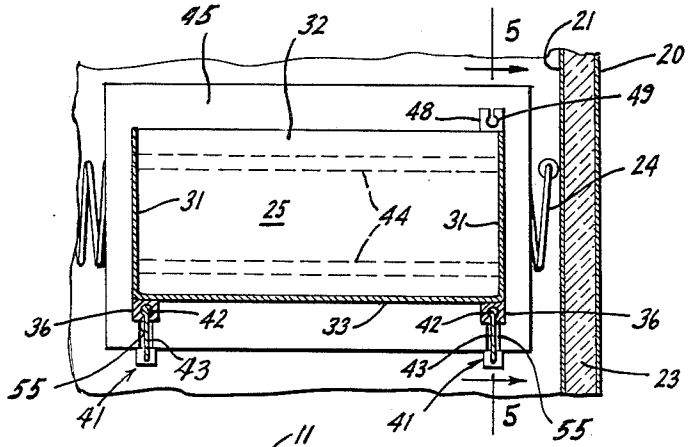


FIG. 4.

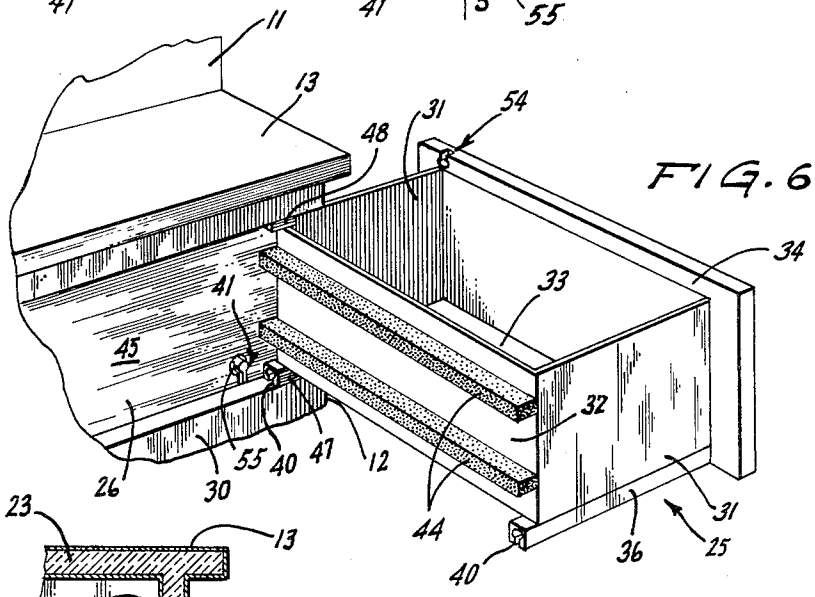


FIG. 6.

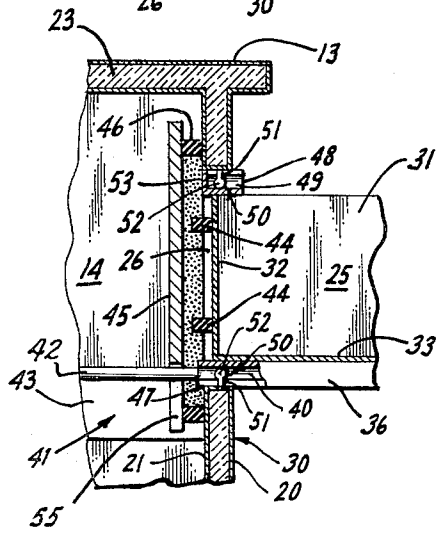


FIG. 5.

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CABINET STRUCTURE

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10 Claims. (Cl. 312—214)

The present invention relates to cabinet structure, and more particularly to improved withdrawable compartment, drawer, or storage bin apparatus of a type normally provided in such structure. While of broader applicability, the invention has particular utility in refrigerated cabinet structure.

It is a particular object of the invention to provide novel means for mounting drawer apparatus in a cabinet.

It is a further object to provide novel refrigerated drawer apparatus that is accessible from the exterior of a refrigerator cabinet.

A specific objective of the invention is to provide simple and effective means disposed in novel cooperative relation with a refrigerator cabinet and a drawer mounted therein to prevent outflow of cold air from the cabinet when the drawer is either opened or removed from its mounting.

To the foregoing general ends, and in accordance with a preferred embodiment of the invention, a drawer having an insulative front wall is mounted for sliding movements through an aperture provided in an insulated outer wall of a refrigerated cabinet. The drawer is removable from the cabinet and a panel is detachably mounted, by suitable means, preferably magnetic, to the drawer, said panel being somewhat larger in area than the opening through which the drawer is slidable. The construction and arrangement of the drawer and magnetically held panel is such that sliding removal of the drawer from the cabinet first causes the panel to engage peripheral portions of the cabinet opening through which the drawer slides, followed by the panel being forcibly detached from the drawer and becoming magnetically attached to the aforesaid peripheral portions of the opening. The panel is then effective to seal the drawer opening and prevent spillage of cold air from the refrigerated cabinet.

The invention is further featured by mounting means that permits pivotal movement of the drawer, upon its full withdrawal from a cabinet. As will be hereinafter fully explained, this latter novel feature is of particular utility in cabinet structure wherein drawers or withdrawable compartments are disposed below a work surface.

The manner in which the foregoing and other objectives of the invention may best be achieved will be clearly understood by making reference to the following description taken in conjunction with the accompanying drawing, in which:

FIGURE 1 is a perspective showing of refrigerator cabinet structure embodying the invention;

FIGURE 2 is a somewhat enlarged sectional view, with parts broken away, looking in the direction of arrows 2—2 as applied to FIGURE 1;

FIGURE 3 is a view similar to FIGURE 2 and showing an operational feature of the invention;

FIGURE 4 is a somewhat enlarged sectional view, with parts broken away, looking in the direction of arrows 4—4 as applied to FIGURE 2;

FIGURE 5 is a sectional view similar to FIGURE 3, but taken generally in a plane indicated by arrows 5—5 as applied to FIGURE 4, and showing an additional operational feature of the invention; and

FIGURE 6 is a somewhat enlarged perspective view, with parts broken away and showing still another operational feature of the invention.

Now making more detailed reference to the drawing,

and first to FIGURES 1 and 2 thereof, the illustrated refrigerator cabinet 10 is of the type having respective upper and lower sections 11 and 12. Section 12 is the base of the cabinet 10, and its top surface 13 is disposed forwardly of the lower portion of cabinet upper section 11. The aforesaid top surface 13 preferably is disposed at work height to serve as a worktable. The upper section 11 extends upwardly and substantially vertically from the rear of the work surface 13 and contains also a food storage compartment 15. Compartments 14 and 15 each have front access openings. Like closure apparatus 16 are provided for the upper and lower compartment openings. Closure apparatus for cabinet structure of the type hereinabove described may advantageously be of the type disclosed and claimed in the copending application of Elmer W. Zearfoss, Jr. entitled "Sliding Door Structure," filed February 19, 1959, bearing Serial No. 794,321, now Patent No. 2,930,667, and assigned to the assignee of the present invention.

Sections 11 and 12 include, additionally, a common outer shell 20. Inner liners 21 and 22 are spaced one from the other as well as from the shell and define, respectively, the aforementioned compartments 14 and 15. Suitable thermal insulation 23 fills the spaces between the aforesaid liners and between the latter and the outer shell.

Cooling means for compartments 14 and 15 may comprise any one of known suitable systems, and other than the showing, by way of example only, of the evaporator coil 24 disposed within lower compartment 14, no detailed description will be made.

According to the invention, and making reference also to FIGURES 3 to 6, drawer means are provided, as seen at 25, each being positioned in spaces intermediate the work surface 13 and lower closure members 16 and mounted for sliding movements, to and from refrigerated compartment 14, through an aperture 26 provided in the front wall 30 of the lower cabinet section. Each drawer means 25 comprises a drawer having side walls 31, rear wall 32, bottom wall 33, each conveniently formed of sheet metal, and a front wall 34 of a thermally insulative sheet provided with a "pull" or handle 35. Insulating characteristics of the front wall 34 of the drawer preferably corresponds to like characteristics of cabinet insulation 23. Cooling of the drawers' contents is achieved by thermal conduction through the metal walls thereof, as well as by convection, from cooled circulating air within compartment 14.

It will of course be understood that inasmuch as both the left and right hand drawer means 25 are preferably similar, at least as to construction and mode of operation, the foregoing description, as well as what follows, is made in reference to the right-hand drawer means only.

Mounting of the drawer for sliding movements is achieved by means of a pair of runners 36, each affixed to edge portions of the drawer bottom wall 33 and having downwardly presented grooves 40 extending along the lengths of the runners. Grooves 40 have a keyhole-like cross section and slidingly engage respective bead and web portions 42 and 43 of guide rails 41 supported within compartment 14 and extending in the direction of the depth thereof.

In particular accordance with the invention, a pair of magnetic strips 44 are affixed to rear wall 32 of drawer 25. Strips 44 magnetically support a ferromagnetic panel 45, in spaced confronting relation to a magnetic sealing strip 46 affixed to liner 21 and disposed along the periphery of aperture 26 in cabinet wall 30. Combined magnet and sealing strips suitable for use in the present invention are presently available on the market and need not be described in detail. However, it is to be understood that the invention contemplates use of other

suitable magnetic holding devices in combination with suitable sealing means. Grooves or slots **55** are formed in panel **45** and slidingly engage rails **41** to ensure alignment of the panel with aperture **26** upon sliding movements of the drawer, and particularly upon withdrawal of the latter from the cabinet.

In the event full withdrawal and removal of the drawer is desired, and with reference especially to FIGURES 3 and 5, movement of the drawer to the position shown in FIGURE 3 effects engagement of panel **45** with magnetic sealing strip **46**. Complete removal of the drawer causes release of the magnetic strips **44** from panel **45**, whereupon support of the latter is transferred to and provided by magnetic sealing strips **46**, as best seen in FIGURE 5, in which the drawer is shown as having been withdrawn sufficiently to remove strips **44** from contact with panel **45**. Thus supported, panel **45**, in cooperative relationship with sealing strip **46**, effectively seals the aperture **26**.

Keeping in mind that a drawer of the type disclosed has particular utility in cabinet structure provided with a work surface, the present invention achieves also concurrent sealing of drawer space and removal of a drawer from its slides to position wherein its contents are readily accessible to the work surface, for example as by pivotal movement to a position where it does not interfere with use of work surface **13**.

In achievement of this latter feature hinging means providing for the hereinabove described pivotal movements of drawer **25** comprises, as best seen in FIGURE 5, a pair of like pintle means **50**, each including a vertically extending rod-like portion **51** terminating in a ball portion **52**. The lower one of the pintle means **50** is mounted by its rod-like portion **51** to the right hand end of the lower edge of opening **26** in such a manner that ball portion **52** is aligned with, and spaced from in the direction of cabinet depth, bead portion **42** of right hand rail **36**. Similarly, rod portion **51** is disposed in alignment with web portion **43** of the same rail **36**. The upper pintle of means **50** is mounted to the upper edge of aperture **26** and is disposed in axial alignment with the lower pintle of the pair.

The right hand runner **40** includes a portion **47** that extends beyond the drawer bottom wall **33** a distance substantially equal to the thickness of front wall **30** of the lower cabinet section. Similarly, a runner-like segment **48** is affixed to the upper right rear corner of the drawer and extends substantially the same distance as extension **47**. Segment **48** includes a groove **49** disposed and adapted to engage the upper pintle of means **50** upon withdrawal of the drawer to the position seen in FIGURE 5. Also, it is seen from FIGURE 6 that when the drawer is in this position both runners **36** have disengaged rails **41**, and runner extension **47** has moved onto the lower pintle of means **50**. In other words, support of the drawer is transferred directly from the rails **41** to pintle means **50** upon movement of the drawer to the position shown in FIGURE 5.

Suitable stop means for preventing complete removal of the drawer, to ensure pivotal mounting thereof, is provided in the form of abutment member **53** that closes the end of groove **49** of upper runner **48** and abuttingly engages the upper pintle of means **50**. While no provision for releasing member **53** is indicated, as would be required to provide for nonpivotal removal of the drawer, it is to be understood that such provision may be made. For example, member **53** may be pivotally mounted and resiliently urged to the position shown. Release of the member would be effected merely by pivoting the same, against its resilient holding means, from over the end of groove **49**.

Upon withdrawal of the drawer to the position shown in FIGURE 5, pivotal movement thereof is readily effected to a position as shown in FIGURE 6. Note in FIGURE 1 that provision is made for the outer edge of each drawer front wall **34** to be recessed within the lower cabinet section side wall. The recess advantageously accommodates full pivotal movement of a drawer to the position shown.

When the drawer is in its closed or rest position pintles of means **50** each are received within suitably formed pockets, one of which is seen at **54**, provided in front wall **34** of the drawer.

While it has been shown in FIGURE 5 that moving the drawer into position for pivotal movement effects breakaway of the closure panel from the drawer, it will be understood that panel breakaway may advantageously be effected solely by pivoting the drawer. In such latter event, magnetic strips **44** would be made thicker to permit complete engagement of the hinging elements upon engagement of the closure panel with the magnetic sealing strip.

It will therefore be appreciated that, in light of the foregoing description, the invention is featured by provision of simple and effective drawer mounting and space sealing means. It will further be appreciated that leverage derived from pivotal movement of the drawer can be utilized to assist breaking of the magnetic force between the panel and the drawer upon pivotal removal of the latter.

While a preferred embodiment of the invention has been described, it will be understood that such modifications thereof are contemplated as fall within the scope of the appended claims.

I claim:

1. In refrigerator cabinet structure of the type having a refrigerated storage compartment defined in part by a horizontally extending insulative top wall and a vertically extending insulative front wall, said top wall serving as a worktable and said front wall having an opening subjacent said top wall and communicating with said compartment, drawer means comprising: a pair of parallelly disposed guide rails including generally cylindrical bearing portions supported within said compartment; a drawer including a pair of runners disposed and adapted slidingly to engage the bearing portions of said rails and providing for sliding movements of said drawer through said opening between a rest position within the compartment and an extended position outside the compartment, said drawer including an insulative wall sealing said opening when in its rest position; a panel spaced transversely from said drawer insulative wall and magnetically mounted upon said drawer; and a magnetic sealing strip disposed along the periphery of said cabinet wall opening magnetically engageable with said drawer-mounted panel to seal said opening upon movement of said drawer to its fully extended position.

2. Structure in accordance with claim 1 being further characterized in that said drawer is removable from said guide rails in its extended position, such removal being effective to release said panel from its magnetic mounting to the drawer, sole support of said panel thence being derived from said magnetic sealing strip.

3. Structure in accordance with claim 2 and further including hinging means providing for lateral pivotal movements of said drawer from a position subjacent said worktable upon removal of said drawer from said guide rails.

4. Structure in accordance with claim 3 wherein said hinging means comprises: a first pintle mounted upon said front wall and including a spherical end portion spaced from and axially aligned with the forward end of the bearing portion of one of said rails, said pintle portion being slidably engageable by one of said runners upon sliding movements of the drawer; a second pintle mounted on said cabinet wall including a spherical end portion positioned in vertical alignment with the like portion of said first pintle; a runner segment on said drawer having a groove engageable with said second pintle spherical portion upon movement of the drawer to its extended position, said first and second pintles being cooperable with said runner segment and said one runner, when the second

pintle is engaged by said segment, to provide for the said lateral pivotal movements of the drawer.

5. In cabinet structure including a wall having an opening therein communicating with a compartment defined in part by said wall, storage bin means normally positioned within said compartment and including an outer wall portion closing said wall opening, means mounting said storage bin means for movements into and out of said cabinet structure through said wall opening, a panel spaced transversely from the wall portion of said bin means and magnetically mounted upon said storage bin means, and sealing strip means disposed along the periphery of said cabinet wall opening and magnetically engageable with said panel mounted upon said storage bin means to seal said opening upon movement of said storage bin means to its fully extended position.

6. In cabinet structure of the type having a compartment defined in part by a wall having an opening communicating with said compartment, drawer means comprising: a pair of guide rails including bearing portions supported within said compartment; a drawer including a pair of runners disposed and adapted slidingly to engage the bearing portions of said guide rails and providing for sliding movement of said drawer through said opening between a rest position within the compartment and an extended position outside said compartment, said drawer including a wall sealing said opening in its rest position; a panel spaced transversely from said drawer wall and magnetically mounted upon said drawer; and sealing strip means disposed along the periphery of cabinet wall opening and magnetically engageable with said drawer mounted panel to seal said opening upon movement of said drawer to its fully extended position.

7. Structure in accordance with claim 6, and further characterized in that said drawer is removable from the guide rails in its extended position, such removal being effective to release said panel from its magnetic mounting to the drawer, sole support of said panel then being derived from said sealing strip means.

8. Structure in accordance with claim 7 and further including hinging means providing for lateral pivotal movements of said drawer from the recited extended position, upon removal of said drawer from said guide rails.

9. Structure in accordance with claim 8, wherein said hinging means comprises: a first pintle mounted upon said front wall and including a spherical end portion spaced from and axially aligned with the forward end of the bearing portion of one of said rails, said pintle being slidably engageable by one of said runners upon sliding movements of the drawer; a second pintle mounted on said cabinet wall opening including a spherical end portion positioned in vertical alignment with the leg portion of said first pintle; a runner segment on said drawer having a groove engageable with said second pintle spherical portion upon movement of the drawer to its extended position, said first and second pintles being cooperable with said runner segment and said one runner, when the second pintle is engaged by said segment, to provide for lateral pivotal movements of the drawer.

10. In refrigerator cabinet structure including a refrigerated storage compartment defined in part by a thermally insulative wall having an opening communicating with said compartment, drawer means comprising: guide rail means within said compartment; a drawer mounted on said guide rail means for sliding movements through said opening between a rest position within the compartment and an extended position outside the compartment, said drawer including a thermally insulative wall sealing said opening when in its rest position; a panel spaced transversely from said drawer insulative wall and magnetically mounted upon said drawer; and a magnetic sealing strip disposed along the periphery of said cabinet wall opening and magnetically engageable with said drawer mounted panel to seal said opening upon movement of said drawer to its fully extended position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,082,082	Jiranek	Dec. 23, 1913
1,171,138	Quagliano	Feb. 8, 1916
1,427,207	Gruendler	Aug. 29, 1922
2,246,342	Brown	June 17, 1941
2,650,871	Holderegger	Sept. 1, 1953