United States Patent [19]

Propst et al.

[11] **3,826,550**

[45] **July 30, 1974**

[54] **STACKABLE DRAWER AND COVER**

[75] Inventors: **Robert L. Propst,** Ann Arbor; **James O. Kelley,** Spring Lake, both of Mich.

[73] Assignee: **Herman Miller Inc.,** Zeeland, Mich.

[22] Filed: **Mar. 13, 1973**

[21] Appl. No.: **340,687**

Related U.S. Application Data

[62] Division of Ser. No. 128,250, March 26, 1971.

[52] **U.S. Cl.** **312/107,** 312/350, 312/351

[51] **Int. Cl.** **A47b 77/00,** A47b 87/00

[58] **Field of Search** ..... 312/107, 108, 292, 330, 312/333, 350, 351, 306–309; 200/97 R, 97 F

[56] **References Cited**

UNITED STATES PATENTS

1,079,507	11/1913	McClernan	312/309 X
2,205,781	6/1940	Vining	312/308 X
2,246,342	6/1941	Brown	312/308 X
2,759,160	8/1956	Kelley	339/75 P
2,769,677	11/1956	Courson et al.	312/308
3,008,788	11/1961	Garner	312/351 X
3,297,386	1/1967	Stanek et al.	312/333
3,538,724	11/1970	Dauenbaugh	312/333
3,698,783	10/1972	Swett et al.	312/351
3,124,402	3/1964	Rhoads	312/350
2,625,456	1/1953	Rostan	312/350 X
1,868,101	7/1932	Hecht	312/119 X
1,148,238	7/1915	Kline	312/107
3,087,771	4/1963	Pari	312/350 X
2,416,132	2/1947	Watson	312/330 X
3,666,342	5/1972	Biesecker	312/333
337,798	3/1886	Sweney	312/330 X

Primary Examiner—Paul R. Gilliam

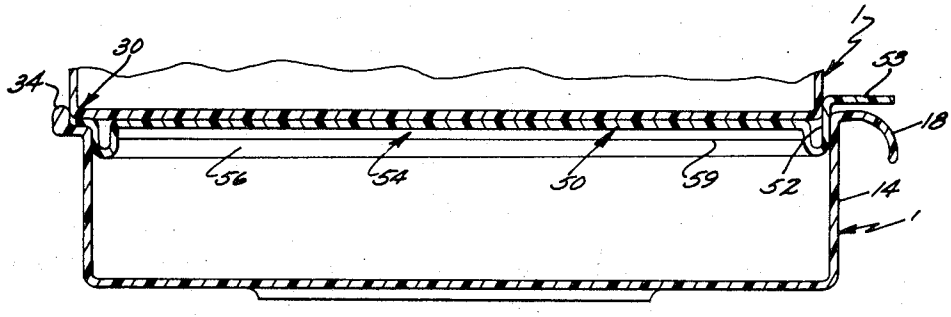
Attorney, Agent, or Firm—Price, Heneveld, Huizenga & Cooper

[57] **ABSTRACT**

A drawer includes a stacking recess around its top perimeter into which another similar drawer can be placed in order to stack the drawers one on top of the other. The drawer includes a cover which is thinner in cross section than the depth of the stacking recess in order that the cover can be positioned on the drawer without interfering the stacking of one drawer on top of another. The cover includes outwardly biased, resilient ribs which extend below the stacking recess when the cover is in place and which press against the drawer walls to insure a tight fit.

The drawer is supported in a structure having opposite sides with inwardly projecting guide flanges for embracing glide flanges projecting outwardly from the drawer. The stacking recess is formed in the drawer glide flanges and the cover rests on the glide flanges such that it is also embraced by the guide flanges of the support and cannot be removed from the drawer when the drawer is closed.

8 Claims, 15 Drawing Figures



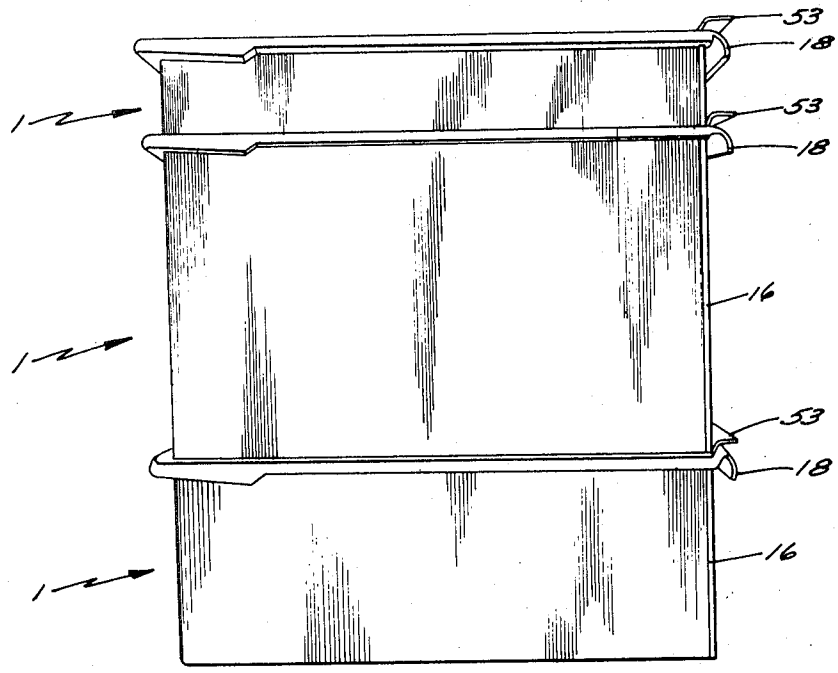


FIG. 7.

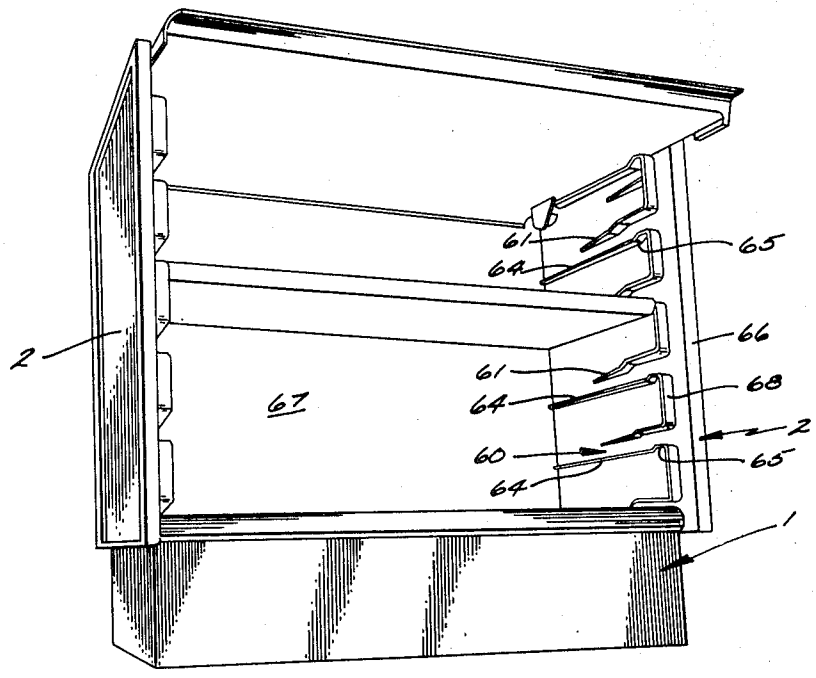


FIG. 1.

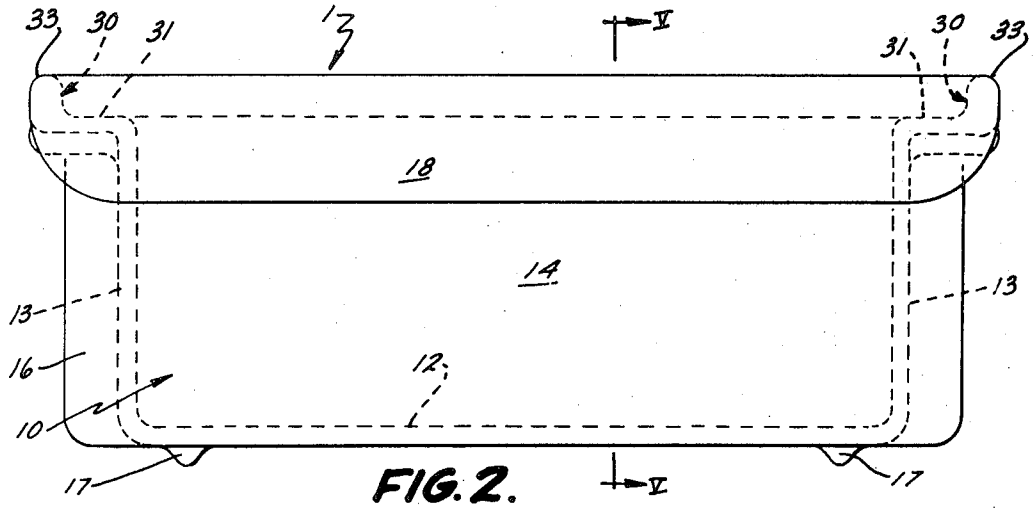


FIG. 2.

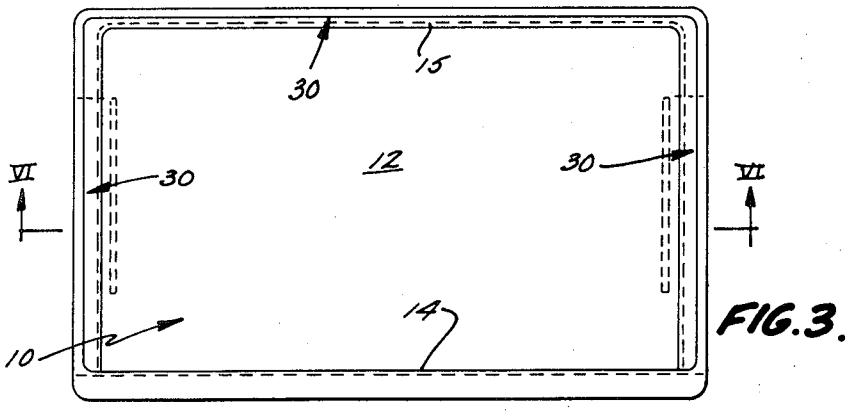


FIG. 3.

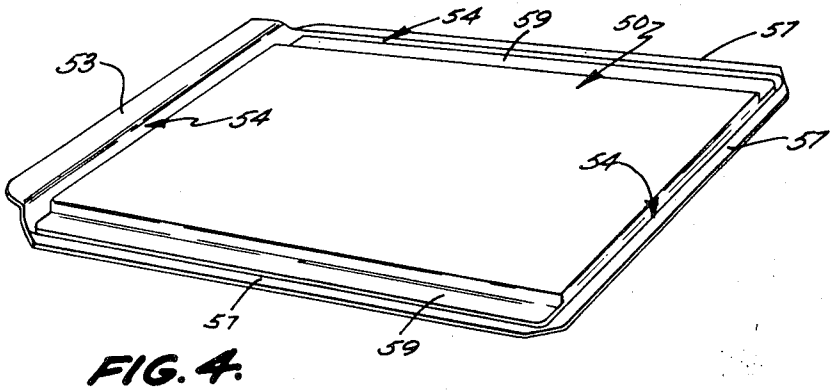


FIG. 4.

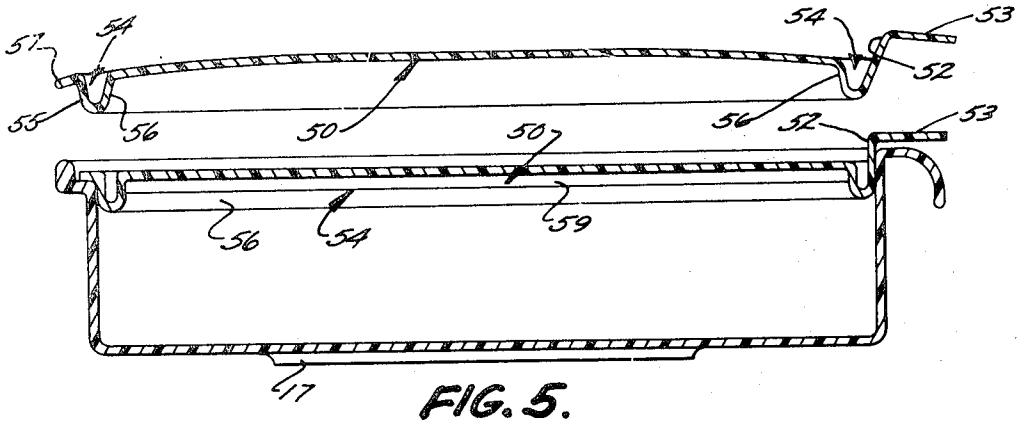


FIG. 5.

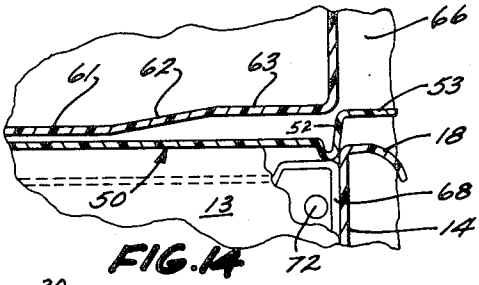


FIG. 14

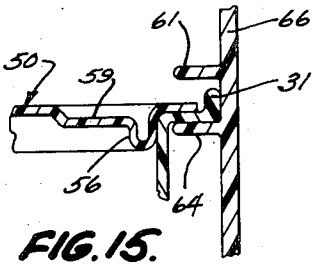


FIG. 15.

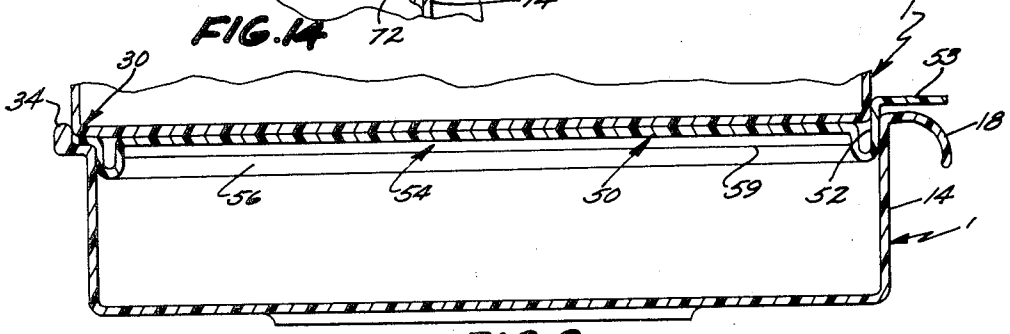


FIG. 8.

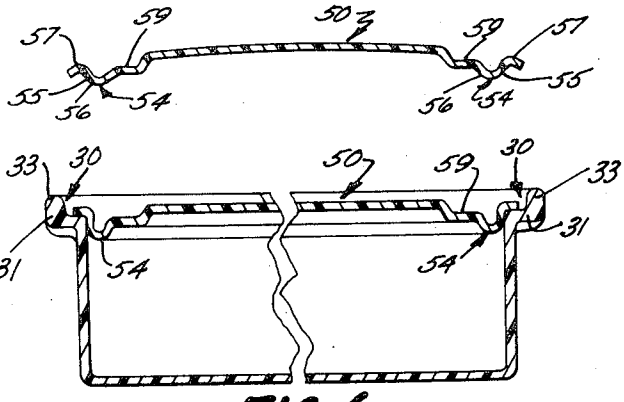


FIG. 6.

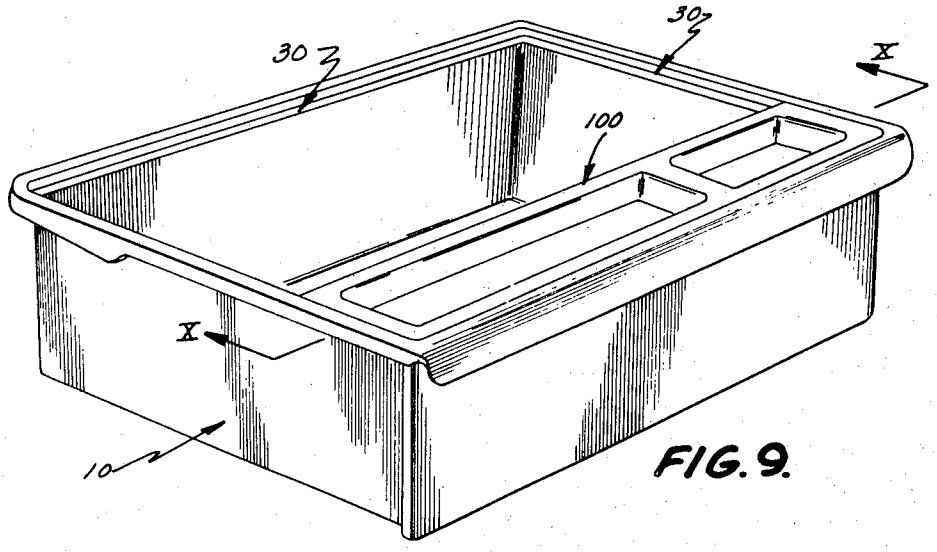


FIG. 9.

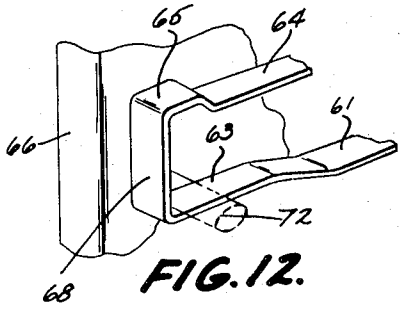


FIG. 12.

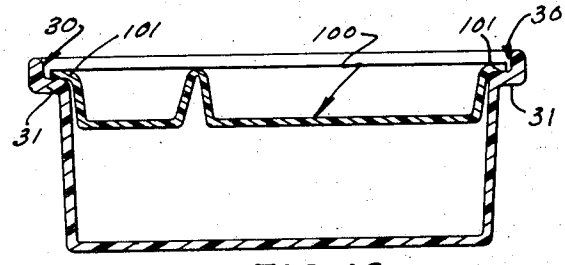


FIG. 10.

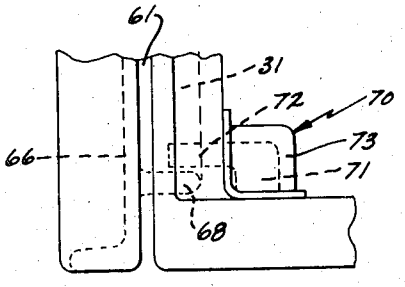


FIG. 13.

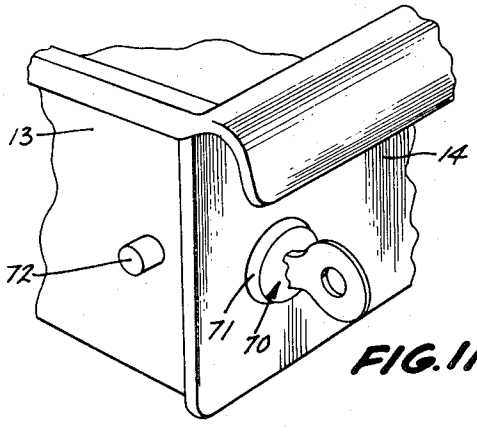


FIG. 11.

STACKABLE DRAWER AND COVER

CROSS REFERENCE TO RELATED APPLICATION

This is a divisional application of parent application Ser. No. 128,250, filed Mar. 26, 1971, and entitled STACKABLE DRAWER AND COVER.

BACKGROUND OF THE INVENTION

This invention relates to drawers and drawer supporting structures. Specifically, it relates to an improvement in the system disclosed and claimed in U.S. Pat. application, Ser. No. 79,890. That application discloses a drawer which can be stacked with other similar drawers. The drawers stacked can be of varying depths. The drawer is supported in a frame having sides with inwardly projecting guide flanges for embracing glide flanges which project outwardly from the drawers. The drawer system therein disclosed is particularly adaptable for use in hospital environments since it offers features of versatility, cleanliness, and economy of manufacture and use.

While the invention as disclosed in the earlier application has a number of desirable features, one problem which is posed is that during storage of the drawers, it is possible for dust to enter the interior of the drawer. Indeed, this is even possible when a drawer is in use, as when a drawer is supported in a C-shaped supporting frame (see FIG. 1). Because of the nature of the supporting frame, it is readily possible for dust to enter the interior of the drawer.

Another problem which is posed is that there is no means for keeping people out of the drawer when it is supported in a frame as shown in FIG. 1. No locking means is provided for the drawer, and even it it were, one would still be able to reach directly into the top of the drawer if it were arranged in a manner, for example, as shown in FIG. 1.

In keeping with the goals set forth in the above-cited patent application, the present invention contemplates the provision of a cover for the drawers to keep their interiors dust free during use and storage. However, to our knowledge, no prior art drawer system teaches providing covers for drawers, which covers would not interfere with the stackability of the drawers. Indeed, to our knowledge, there are no prior art drawer systems which utilize covers.

SUMMARY OF THE INVENTION

The present invention contemplates a drawer and a cover therefor which does not interfere with the stackability of one of the drawers on top of another. The drawer includes a stacking recess at the top of the drawer within which another drawer can be rested. The drawer cover has dimensions such that it also rests within the recess. But, the cover is thinner than the depth of the stacking recess whereby one drawer can be stacked on top of another even with a cover in place on the lower drawer.

The cover has a first flange at one end thereof extending upwardly beyond the top of the drawer and then extending outwardly from the top of the first flange out over one of the end walls to define a handle for handling the cover. To minimize the possibility of foreign matter entering the drawer when it is in storage, the drawer includes means for resiliently engaging the drawer walls whereby the cover is held firmly in place on the drawer.

The cover for the drawer also acts in combination with the drawer supporting frame to provide a means for preventing an unauthorized person from obtaining access to the drawer's contents. The drawer has outwardly projecting glide flanges. The support for the drawer comprises two spaced sides, each having at least one pair of vertically spaced, inwardly projecting guide flanges for embracing the glide flanges of the drawer. The cover for the drawer comprises a panel of sufficient width that it rests on the drawer glide flanges and hence is itself embraced at either side of the drawer by the guide flanges of the support. The front wall of the drawer extends above the level of the panel as it rests on the glide flanges and the cover includes a flange projecting upwardly and outwardly from the panel, out over the top edge of the front wall of the drawer to provide a handle for handling the cover. The guide flanges extend sufficiently far forward and are sufficiently close together that the top guide flange, in cooperation with the front wall of the drawer, prevents the removal of the drawer cover when the drawer is in a closed position in the drawer support. By locking the drawer in a closed position, it becomes impossible to remove the drawer cover. Thus, access to the contents of a drawer is restricted even when there is an open space above the drawer as there is in the combination shown in FIG. 1.

DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will be seen and understood by reference to the written specification and appended drawings wherein:

FIG. 1 is a perspective view of the drawer being supported in the drawer supporting frame;

FIG. 2 is a front view of the drawer;

FIG. 3 is a plan view of the drawer;

FIG. 4 is a perspective view of the drawer cover;

FIG. 5 is a cross section taken along plane V—V of FIG. 2 with the drawer cover being shown on the drawer, and with a second cover shown above the drawer to demonstrate the biased condition at its edges;

FIG. 6 is a cross section taken along plane VI—VI of FIG. 3, with the drawer cover being shown in place on the drawer, and with a second cover shown above the drawer to demonstrate the biased condition at its edges;

FIG. 7 is a side perspective view of several drawers stacked one on top of the other with drawer covers in place;

FIG. 8 is a cross section taken along plane V—V of FIG. 2 and additionally showing a drawer cover in place on a drawer and a subsequent drawer stacked on top thereof;

FIG. 9 is a perspective view of a drawer having a tray insert in the stacking recess;

FIG. 10 is a cross section taken along plane X—X of FIG. 9;

FIG. 11 is a perspective view of a corner of the drawer having a lock therein;

FIG. 12 is a fragmentary, perspective view of the front portions of interconnected guide flanges on the drawer supporting frame;

FIG. 13 is a fragmentary, plan view of the front corner of a drawer having a lock therein and of the front portion of one of the side walls of the drawer supporting frame;

FIG. 14 is a fragmentary, cross-sectional view showing a drawer and drawer cover in position in the drawer support; and

FIG. 15 is a front, fragmentary, cross-sectional view showing the drawer and drawer cover in position between a pair of spaced guide flanges.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a drawer 1 supported in a drawer supporting frame 2. The drawer itself includes a recess 30 along three sides of the top perimeter of the drawer body 10 (FIGS. 2, 3 & 9). A cover 50 is placed on top of drawer 1 within the recess 30 (FIGS. 5 & 6). Cover 50 is thinner than the depth of recess 30 such that one drawer 1 can be stacked on top of another drawer 1 and will still be nested within recess 30 (FIG. 8). A tray insert 100 can also be nested within stacking recess 30 (FIG. 9) and also has a cross section at its sides which is thinner than the depth of recess 30 (FIG. 10).

Recess 30 is defined at the side walls 13 of drawer 1 by a pair of outwardly projecting glide flanges 31 (FIGS. 2 & 6). Each of these glide flanges 31 fits between a pair of spaced guide flanges, i.e., a top guide flange 61 and a bottom guide flange 64, projecting inwardly from the side 66 of support frame 2 (FIGS. 1 & 15). Cover 50 rests on glide flanges 31 and accordingly is held down on drawer 1 by top guide flange 61 (FIG. 15). A lock 70 (FIGS. 11 & 13) is preferably included in drawer 1 to provide a means for locking it in position in support 2 and for thereby preventing removal of cover 50.

Drawer body 10 of drawer 1 comprises a bottom 12, upstanding side walls 13, upstanding front wall 14 and an upstanding rear wall 15 (FIGS. 1 & 2). Front wall 14 and rear wall 15 are perfectly vertical (FIG. 5) in order to facilitate the stacking of drawers having different depths without allowing one drawer to actually nest within another lower drawer (FIG. 7). This feature of the invention has been explained in previous application Ser. No. 79,890. Front wall 14 of drawer body 10 extends beyond the side walls 13 at either side of drawer body 10 in order to provide a stacking rib 16 at either side of drawer body 10 (FIGS. 2 & 7). This feature has similarly been previously described. A pair of spaced feet 17 depend downwardly from the bottom 12 of drawer body 10 (FIG. 2) and a handle 18 is formed by a flange projecting outwardly and downwardly from the top of front wall 14 (FIG. 5).

Recess 30 extends along the top perimeter of side walls 13 and rear wall 15 (FIGS. 3 & 9). At the top of each side wall 13, recess 30 is formed by an outwardly projecting glide flange 31 (FIG. 2). A side shoulder 33 then projects upwardly from the edge of glide flange 31 and is continuous therewith to define the depth of recess 30 (FIG. 2). Similarly, a rear flange 32 projects rearwardly from the top of rear wall 15 and a rear shoulder 34 projects upwardly from the outside edge of rear flange 32 to define the rear portion of recess 30. In effect, the glide flanges 31 and rear flange 32 define a stacking ledge upon which subsequent drawers can be stacked and upon which cover 50 can be placed (FIGS. 5, 6 & 8). Side shoulders 33 and rear shoulder 34 then provide a means for preventing lateral and rearward shifting of cover 50 and of a drawer 1 stacked thereon.

Front wall 14 is taller than side walls 13 such that its top edge is generally continuous with the top edges of side shoulders 33 and rear shoulder 34 (FIGS. 1 & 3). Thus, it also acts, in a sense, to define a recess, although it does not include a stacking ledge. It does act as a stop to prevent one from removing cover 50 by sliding it straight forwardly (FIG. 5) and similarly prevents one from sliding a stacked drawer 1 straight forwardly (FIG. 8).

Cover 50 comprises a large flat panel 51 (FIG. 4) having a flange 52 projecting upwardly from the front edge thereof. A second flange 53 projects outwardly from the top edge of flange 52. The upwardly projecting flange 52 and the outwardly projecting flange 53 thus provide a handle whereby cover 50 can be conveniently removed from drawer 1, even though the panel 51 of cover 50 is recessed within stacking recess 30 below the top edge of front wall 14 (FIG. 5). When cover 50 is seated in place on drawer 1, flange 53 is spaced slightly above handle 18 and the top edge of drawer 14 due to the height of flange 52. Similarly, it projects outwardly over handle 18 such that it can be conveniently gripped to provide a convenient means for removing cover 50 from drawer 1.

Cover 50 is thinner in cross section than the height of side shoulder 33 and rear shoulder 34 (FIGS. 5 & 6). In other words, cover 50 is thinner than the depth of stacking recess 30. Consequently, a drawer 1 can be stacked on top of another drawer 1 even though a cover 30 is in place on the lower drawer 1. It should also be noted that the distance between rear shoulder 34 and front wall 14 is sufficiently great that the upper drawer 1 will fit within recess 30, even though a cover 50 is in place and its upwardly projecting flange 52 is disposed between the bottom of a drawer 1 and front wall 14 (FIG. 8). When the drawers 1 are stacked one on top of the other with the covers 50 in place, they have the appearance shown in FIG. 7.

To accomodate the feet 17 of drawer 1, panel 51 of cover 50 is recessed near its side edges to define foot recesses 59 (FIGS. 4, 5 & 6). Foot recesses 59 are approximately as deep as the height of feet 17 such that the engagement of feet 17 with cover 50 does not prevent drawer 1 from nesting properly within the stacking recess 30 of a lower drawer 1.

In order to minimize the possibility of cover 50 from being accidentally knocked ajar or removed when it is in place on drawer 1, a resilient rib 54 depends downwardly from panel 50 and extends around the perimeter thereof (FIGS. 4, 5 & 6). It is a grooved deformation in panel 50 forming an inner wall 56 joined to an outer wall 55 at the base of the groove (FIGS. 5 & 6). At the front of cover 50, the outer wall of rib 54 is defined by flange 52, which also forms a portion of the handle for cover 50.

The outer walls 55 of rib 54, and flange 52 at the front of cover 50, are biased outwardly as can be seen by reference to FIGS. 5 & 6. Thus when cover 50 is inserted onto a drawer 1, these outer walls 55 and flange 52 must be forced inwardly. As a result, they forcibly engage the walls 13, 14 and 15 of drawer 1. Consequently, cover 50 is held snugly in place on drawer 1.

Finally, a generally horizontal peripheral flange **57** extends along the sides and rear of cover **50** (FIGS. **4, 5 & 6**). It is flange **57** which rests on the stacking ledge defined by glide flanges **31** and rear flanges **32** of drawer **1.**

The glide flanges **31** not only act to provide a stacking ledge and a ledge upon which cover **50** can be rested, but also they provide a means for hanging drawer **1** in drawer supporting structure **2** (FIG. **1**). Drawer supporting structure **2** comprises a rear wall **67** and a pair of forwardly projecting, spaced vertical side walls **66.** Guides **60** are provided for embracing glide flanges **31** to thereby support drawer **1.** The guides **60** are defined by a pair of spaced, inwardly projecting guide flanges. These include a top guide flange **61** and a bottom guide flange **64.** Glide flanges **31** are then embraced by guide flanges **61** and **64** (FIG. **5**).

Bottom guide flange **64** is generally straight and flat, extending from the rear wall **67** almost to the front of side wall **66** (FIG. **1**). It includes an upwardly projecting deviation **65** near the front thereof which acts as a stop for drawer **1** in the manner which has heretofore been described in Ser. No. 79,890.

Top guide flange **61** begins about one-third to one-half the distance from rear wall **67** and extends forwardly to an inclined portion **62.** The inclined portion **62** slopes upwardly to a raised front portion **63** which then extends as far forwardly as bottom guide flange **64** (FIG. **14**). As has been heretofore described in application Ser. No. 79,890, the raised front portion **63** facilitates removal of drawer **1** from drawer supporting frame **2.** However, it also allows clearance for the handle on cover **50,** which handle is defined by upwardly projecting flange **52** and outwardly projecting flange **53** (FIG. **14**). The spacing of raised front portion **63** allows flange **53** to be spaced a slight distance above handle **18** on drawer **1** to thereby make flange **53** easier to grasp.

Cover **50,** since it rests on glide flange **31** of drawer **1,** is also embraced by the guide flanges **61** and **64** of support **2** (FIG. **15**). It should be noted that upper guide flange **61,** including inclined portion **62** and raised front portion **63,** project forwardly a sufficient distance that they act to block the removal of cover **50** when drawer **1** is in its closed position. (FIG. **14**). Thus, cover **50** cannot be raised because flange **53** will bump into the raised front portion **63** of top guide flange **61** (FIG. **14**). Similarly, cover **50** cannot be removed by pulling it straight forwardly, since it sits down within recess **30** and front wall **14** of drawer body **10** extends upwardly a sufficient distance to block the removal of cover **50** by sliding it forwardly (FIG. **14**). Thus, when drawer **1** is in its closed position, cover **50** cannot be removed therefrom.

Lock **70,** which is optional on drawer **1,** makes it possible to lock drawer **1** in place in support **2** (FIG. **13**). Lock **70** is a cam-type lock having a body **71** (FIG. **3**) and a lock pin **72** which can be projected from or retracted into lock body **71** (FIGS. **11 & 13**). Lock body **71** is mounted with its front projecting through a hole in front wall **14** and with its lock pin **72** extending through a hole in side wall **13** (FIG. **11**). Lock **70** acts to lock drawer **1** in place by cooperating with a blocking flange **68** projecting inwardly from side **66** of support **2** (FIGS. **1 & 12**). Blocking flange **68** extends from the bottom guide flange **64** of one pair of spaced guide flanges to the top guide flange **61** of the next lower pair of spaced guide flanges (FIG. **1**). Specificially, blocking flange **68** extends from the stop portion **65** of bottom guide flange **64** to the raised front portion **63** of the next lower top guide flange **61** (FIG. **12**).

The stop pin **72** of lock **70** has been indicated in phantom in FIG. **12** to show the manner in which it cooperates with blocking flange **68** to lock a drawer **1** in place. This cooperation can similarly be seen in the fragmentary plan view, FIG. **13.** Similarly in FIG. **14** the upper corner wall portion of wall **13** of drawer **1** has been cut away to show stop lock pin **72** in abutting relationship with blocking flange **68.**

Lock **70** is encased on the inside of drawer **1** by means of a plastic encasement **73** which is adhered to the interior of drawer body **10** by means of glue or the like. Normally, such lock structures are either exposed on the interior of the drawer, or they are hidden by some type of double walled drawer structure. The use of a simple plastic encasement member **73** greatly simplifies the construction of drawer **1** and yet provides surfaces which can be readily cleaned and which do not gather dust. It also keeps any grease or oil in the lock mechanism from getting on the inside of drawer **1.**

Tray insert **100** provides additional storage space for drawer **1** and it also rests on guide flanges **31** by means of supporting flanges **101** (FIG. **10**). Tray **100** is specifically provided with a thin cross section such that its supporting flanges **101** are thinner than the depth of recess **30.** In this manner, tray **100** does not interfere with the stackability of one drawer on top of another. Further, a drawer, bearing tray **100** could still be provided with a cover **50** when placed in support **2.** This is because tray **100** and cover **50** are both thinner in cross section, at least at their edges, than the depth of recess **30.** Accordingly, there is room for both within recess **30.**

In operation, a drawer **1** can be filled at a remote location and provided with a cover **50** for storage. The cover **50** will not interfere with stacking and fits snugly to prevent accidental removal. Covered drawers **1** can be stacked one on top of another in the same manner as drawer stacking is contemplated by U.S. Pat. application Ser. No. 79,890 (FIG. **7**).

When it is desired to use a filled drawer **1,** it can be placed into a drawer supporting frame **2** which in turn can be supported at any desired location. Cover **50** can still be used to provide a means for keeping dust out of the interior of drawer **1.** It can also provide a means for sealing the contents of drawer **1** from intruders. When drawer **1** is closed in frame **2** cover **50** cannot be removed therefrom because it is blocked by the front wall **14** of drawer body **10** and by top guide flange **61** of support **2.** Lock **70** can be locked to thereby prevent both the removal of drawer **1** from support **2** and the removal of cover **50** from drawer **1.**

It is understood that the above is merely a preferred embodiment of this invention and that many changes and alterations can be made thereof without departing from its spirit and broader aspects.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

1. A drawer and drawer supporting combination for use in hospital environments and the like comprising: a drawer having glide flanges extending outwardly from the top of each side thereof said drawer including a rear wall having an upper portion projecting upwardly

above the level of said cover to restrain rearward movement thereof; a support, for receiving various combinations of drawers such as said drawer, comprising a pair of spaced sides, each having at least one pair of vertically spaced, inwardly projecting guide flanges for embracing said glide flanges of said drawer; said support having a generally open front, when not closed by a front door or the like, whereby said drawer is accessible by reaching into it through said generally open front; a cover for said drawer comprising a panel of sufficient width that it rests on said glide flanges and is itself embraced at either side by said guide flanges; said cover extending generally from said rear wall to the front wall of said drawer; the front wall of said drawer extending above the level of said panel as it rests on said glide flanges to restrain forward movement of said cover; the top one of said spaced guide flanges extending sufficiently far forward and being spaced sufficiently close to the bottom one of said guide flanges that said top guide flange, in cooperation with the front wall and rear wall upper portion of said drawer prevents the removal of said drawer cover when said drawer is in a closed position in said support.

2. The combination of claim **1** with said cover including a handle flange projecting upwardly from the front edge of said panel and then projecting outwardly over and beyond the top edge of said front wall to provide a handle for said cover.

3. The combination of claim **2** in which said handle flange extends from one side to the other of said cover and said top guide flange inclines upwardly toward the front of said support, causing the front portion of said top guide flange to be raised a greater distance from said lower guide flange to thereby provide room to accomodate the upwardly and outwardly projecting handle flange of said drawer cover.

4. The combination of claim **1** in which said drawer includes means for locking said drawer in said support.

5. The combination of claim **4** in which said means for locking said drawer in said support comprises: a lock in said drawer including a retractable pin projecting through the side of said drawer; a stop member projecting inwardly from said side of said drawer support in the path followed by said lock pin as said drawer is moved forwardly and rearwardly between said spaced guide flanges whereby when said lock pin is in its projected position it engages said stop member to prevent removal of said drawer.

6. The combination of claim **5** in which said support includes more than one pair of said spaced vertical guide flanges; said stop flange comprising an inwardly projecting flange extending from the front of the bottom guide flange of one pair of spaced guide flanges to the front of the top guide flange of the next lower pair of spaced guide flanges.

7. The combination of claim **5** in which said lock includes a body on the inside of said drawer; a plastic encasement member adhered to the inside of said drawer around said body so as to enclose said body.

8. A drawer and drawer supporting combination comprising: a drawer having glide flanges extending outwardly from the top of each side thereof; a support for said drawer comprising a pair of spaced sides, each having at least one pair of vertically spaced, inwardly projecting guide flanges for embracing said glide flanges of said drawer; a cover for said drawer comprising a panel of sufficient width that it rests on said glide flanges and is itself embraced at either side by said guide flanges; the front wall of said drawer extending above the level of said panel as it rests on said glide flanges; said cover including a handle flange projecting upwardly from the front edge of said panel and then projecting outwardly over and beyond the top edge of said front wall to provide a handle for said cover; the top one of said spaced guide flanges extending sufficiently far forward and being spaced sufficiently close to the bottom one of said guide flanges that said top guide flange, in cooperation with the front wall of said drawer prevents the removal of said drawer cover when said drawer is in a closed position in said support; said glide flanges including upwardly projecting shoulders for restricting lateral movement of said cover; said drawer including a rear wall, also extending above the level of said panel as it rests on said glide flanges; said shoulders also extending above the level of said panel as it rests on said glide flanges whereby the top portions of said front and rear walls and said shoulders define the walls of a stacking recess deeper than the thickness of said panel; the bottom of said drawer having a width such that it will rest on said glide flanges of a lower drawer and having a length less than the distance between said top portion of said rear wall and said top portion of said front wall by an amount at least equal to the thickness of said upwardly extending flange of said cover such that one of said drawers will stack within said recess of a lower one of said drawers even with said cover in place on said lower drawer.

* * * * *