MODULAR CABINET CONSTRUCTION

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ABSTRACT

Modular cabinet construction wherein cabinet components, such as drawers, interior dividers, shelves, and exterior doors can be interchanged easily and quickly to convert the cabinet from all drawer type storage to all cupboard type storage, or to practically any desired combination of the two. The doors and interior dividers are mounted on the cabinet by resiliently biased pins or bolts, retraction of which permits removal of these members for converting the cabinet as desired. Drawer stop assemblies are provided on drawer guide members for preventing complete withdrawal of the drawers from the cabinet, with such assemblies being resiliently biased and adapted to be cammed out of the way to permit removal of the drawer for rearrangement thereof in the cabinet or for converting the cabinet into cupboard type storage.

10 Claims, 16 Drawing Figures
FIG. 1

FIG. 2

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MODULAR CABINET CONSTRUCTION

SUMMARY OF THE INVENTION

The invention relates as indicated to modular cabinet construction, and more particularly to a new and uniquely constructed cabinet in which the component parts can be quickly and easily interchanged to provide an interior storage arrangement of almost infinite variety. Such flexibility is accomplished without sacrificing either the esthetic qualities of the cabinet or the quality of materials which necessarily must be provided in view of the contemplated area or areas of use. Although the cabinet construction of the present invention permits generally universal use, the cabinet finds particularly advantageous use in scientific laboratories and the like. The term “cabinet” is used herein in its broadest sense and is intended to cover any enclosure, facility or equipment adaptable to the concepts of the invention.

Furniture intended to be used in such environment should possess certain characteristics. First, the exposed cabinet surfaces must be completely resistant to chemical reagents which are likely to be associated on or near the cabinets. This requirement has in recent years resulted in the increased use of metal furniture or wood furniture covered where necessary with plastic laminate material.

Secondly, the cabinet construction should have both the necessary strength and the durability so as not to require early replacement. Such characteristics should not be inimical to the desired esthetic qualities of the cabinet, and the materials employed should not detract from the exterior appearance of the cabinet.

A further desired characteristic of laboratory furniture, which is found totally lacking in present commercially available furniture of this type, is that of flexibility. By flexibility is meant the capability of being converted from one general use, such as cupboard storage, to a different use, for example, drawer storage in order to provide the most efficient utilization of the furniture for a particular purpose or function. With the ever-increasing mobility of scientific personnel, the rearrangement of storage areas within a scientific laboratory is becoming more frequent, and flexibility as provided by the present invention eliminates total replacement of cabinetry, which so often happens with existing cabinet construction.

It is therefore a primary object of the present invention to provide cabinet construction in which the cabinet can be quickly and easily converted from total or partial drawer storage to total or partial cupboard storage, or to variations of each, as desired.

A further object of the present invention is to provide a cabinet in which the drawer guides are constructed and arranged for modular interchangeability of all drawers. The drawers are dimensioned so as to be either a basic unit or a multiple of a basic unit. Thus, the drawers can be arranged from top to bottom in the cabinet as desired, and can be provided in two lengths, to extend the entire width of the cabinet, or approximately half the width of the cabinet, as will be described.

A further object of the present invention is to provide a cabinet which is highly rigid and yet esthetically pleasing in external appearance. The materials employed and construction techniques followed provide the desired rigidity, as well as durability thereby permitting long and rugged use of the equipment.

A still further object of the present invention is to provide means for releasably stopping the cabinet drawers in their outermost position. Such stop means is uniquely constructed and adapted to be released by simple tool manipulation for permitting withdrawal of the drawer completely from the cabinet.

Yet another object of the present invention is to provide a cabinet wherein the front door is mounted on the cabinet by means of a fixed pivot and a releasable pivot so as to permit quick and easy installation or removal of the door when convertibility to drawer storage is desired.

A further aspect of the invention comprises the releasable pin retention of all the major internal partitions or dividers in the cabinet, for the same purpose of permitting quick removal or replacement thereof.

These and other objects of the invention will be apparent as the description proceeds in particular reference to the application drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a cabinet constructed in accordance with the present invention;
FIG. 2 is a front elevational view of the cabinet of FIG. 1, with the door and drawers removed;
FIG. 3 is a vertical sectional view taken on line 3–3 of FIG. 2;
FIG. 4 is a vertical sectional line taken on line 4–4 of FIG. 3;
FIG. 5 is a vertical sectional view taken on line 5–5 of FIG. 3;
FIG. 6 is a vertical sectional view taken on line 6–6 of FIG. 1, showing the releasable mounting of the front door;
FIG. 7 is a sectional line taken on line 7–7 of FIG. 6;
FIG. 8 is a front elevational view similar to FIG. 2, showing, however, an alternative arrangement in the interior of the cabinet, with a horizontal divider extending the entire width of the cabinet, and a partial vertical divider separating the area above the horizontal divider into two sections;
FIG. 9 is a sectional view taken on line 9–9 of FIG. 8;
FIG. 10 is a horizontal sectional view taken on line 10–10 of FIG. 8;
FIG. 11 is a sectional view taken on line 11–11 of FIG. 10;
FIG. 12 is a vertical sectional view taken through one side of a drawer and the associated drawer guide;
FIG. 13 is a sectional view taken on line 13–13 of FIG. 12;
FIG. 14 is a vertical sectional view similar to FIG. 12 showing a modified form of cabinet and drawer guide construction,
FIG. 15 is a vertical sectional view similar to FIG. 6, showing a modified form of releasable pin mounting for the door, and
FIG. 16 is a sectional view taken on line 16–16 of FIG. 15.

DETAILED DESCRIPTION

Referring now in more detail to the drawings, wherein like parts are indicated by like reference nu-
3,700,300

minals, and initially to FIG. 1, there is shown therein a cabinet constructed in accordance with the present invention. From the exterior of the cabinet, the cabinet appears to be conventional, comprising side walls 2 and 4, a top wall 6, and a bottom wall 8, FIG. 2. The front faces of the several walls form a planar access surface which is adapted to be flush with either drawers or doors, or a combination of each. A base plate 10 is provided at the bottom, front end of the cabinet, with the side wall 2 and 4 being recessed as commonly indicated at 12 to provide an open bottom area. Although the side walls 2 and 4 are shown extending completely to the bottom of the cabinet for supporting the same in such regions, it will be understood that a completely separate base section can alternatively be provided, with the cabinet, including the side walls 2 and 4 being rigidly mounted thereon.

The cabinet shown in FIG. 1 includes a door 14 which is mounted for pivotal swinging movement about a vertical axis adjacent the right edge thereof as will be explained in detail hereinafter when particular reference is made to FIG. 6. Mounted in the left side of the cabinet are three relatively shallow drawers commonly designated at 16, an intermediate, relatively deeper drawer 18, and a deep bottom drawer 20. As above indicated, the provision of modular construction is one of the primary objects of the present invention, and in accordance therewith, the height of the drawer 18 is approximately twice the height of the drawers 16, and the height of the drawer 20 is approximately three times the height of the drawers 16. The drawer sections are completely interchangeable, with the interior of the cabinet being constructed and arranged to receive these drawers in any desired pattern. For example, the deepest drawer 20 could be positioned on the top, and the relatively shallow drawers 16 on the bottom, or the drawers 16 could be positioned between the relatively deeper drawers 18 and 20. In addition, drawers could also be located on the right side of the cabinet, and the door 14 removed. Still further arrangements provide for drawers to extend the entire width of the cabinet, or for a pair of doors 14 to be used, with this latter arrangement being preferred when cupboard storage exclusively is desired.

The drawers 16–20 and door 14 can be provided with any suitable handles, with generally cup shaped handles designated at 22 being illustratively shown. These are of conventional construction, and inset in the front surfaces of the drawers and door. Any suitable handle construction can be used, with the material preferably being resistant to the environment to which the cabinet is likely to be subjected. For example, the handles 22 are preferably made of plastic or a coated metal substantially completely resistant to chemical agents. Likewise, the top 6 of the cabinet is covered with a resistant surface, preferably in the form of a commercially available plastic laminate 24, shown in FIGS. 3–6. Such laminated plastic is commercially available from numerous sources in a highly resistant laboratory grade. Such laboratory grade plastic forms the working surface of the cabinet and is normally rigidly attached to a plastic laminate backing sheet which is in turn mounted on a wood core, which normally comprises plywood or particle board. It will be understood that said laminate can be used on other exposed surfaces where necessary or desired.

Referring now to FIGS. 2 and 3, the cabinet is constructed as a shell completely open at the front. In addition to the top, bottom and side walls above described, the cabinet is enclosed at the back thereof by means of a rectangular wood frame member 26, FIG. 3, to which is mounted a member 28 which can be constructed of tempered hard board or the like, and which is secured to the frame member 26 by screw fasteners 30.

Positioned on the inside of each of the side walls 2 and 4 are upper and lower drawer guide panels commonly designated at 32 and 34, respectively. These panels are generally coextensive in depth with the side walls 4 and collectively extend between the bottom wall 8 and the top wall 6, with the panels on each wall being separated as shown at 36 to permit placement in the cabinet of a horizontal divider, as will be hereinafter described when particular reference is made to the internal arrangement shown in FIG. 8. The panels 32 and 34 can be secured to the side walls in any suitable manner, for example, by adhesive, by metal fasteners, or both.

Mounted in vertically spaced relation on each of the panels 32 and 34 are drawer guides commonly designated at 38. The guides 38 are rigidly mounted in openings 40 in the panels and are uniformly, vertically spaced on the side walls 2 and 4. This permits the above described interchangeability of the drawers, with drawers of integral or fractional modular height, thereby achieving the modular construction which distinguishes the present invention from prior cabinet constructions of this general type.

Referring to FIGS. 12 and 13, each drawer guide 38 extends inwardly of the cabinet interior beyond the panel 32 and is adapted to receive the side 42 of a drawer 16, with the latter being provided with a longitudinal groove 44 somewhat deeper and wider than the exposed portion of the drawer guide to permit free movement of the drawer thereover. The drawer further includes a bottom section 46 and an opposed side portion similarly suspended by means of a drawer guide mounted on the opposed side wall of the cabinet, or positioned longitudinally midway of the cabinet, as shown in FIG. 8.

Each of the drawer guides 38 is adapted to receive a drawer stop assembly generally indicated at 50. The assembly 50 includes an outer, hollow casing 52 the exterior dimensions of which correspond to the dimensions of an opening 54 formed in the drawer guide 38. The casing may be press-fit in such opening or secured therein by adhesive, fasteners or the like. The stop assembly can alternatively be mounted on the drawer or on any member adjacent to the drawer.

Mounted within the casing 52 is a generally cup shaped stop member 56 which is biased toward the outer face of the casing by coil springs commonly designated at 58. Integrally formed with the stop member 56 is a stop flange 60 which extends outwardly of the casing through opening 62 formed in the front wall thereof under the bias of springs 58. The stop flange 60 is generally elongated and formed with a front cam surface 64 for a purpose to be presently described.

The side wall 42 of the drawer 16 is formed with a longitudinally extending groove 66 which communicates with the recess 44, with the groove extending substantially the entire length of the side wall. The end
of the groove 66 is defined by a shoulder 68 relatively adjacent the back wall 70 of the drawer. During normal movement of the drawer, the groove 66 receives the stop flange 60 and no interference results. The withdrawal of the drawer 16 is limited to the point where the shoulder 68 contacts the stop flange 60.

If it is desired to remove the drawer 16 for any reason, the stop flange 60 can be cammed inwardly against the bias of the springs 58 until the shoulder 68 clears the flange. A suitable tool extendable along the groove 66 can be provided for this purpose. When the drawer is replaced, the vertical rear face 72 of the side wall 42 cams the stop flange 60 inwardly permitting the drawer to be moved inwardly on the drawer guides 38. As the drawer moves inwardly, the stop flange 60 will again be received in the groove 66 to prevent subsequent, inadvertent withdrawal of the door completely from the cabinet.

Each of the drawer guides 38 is preferably provided with a crossbar stop assembly 50 of the type just described whereby each of the single drawers 16 can be disposed vertically along any pair of spaced drawer guides. The double drawer 18 and triple drawer 20 illustrated in FIG. 1 are likewise provided with the necessary groove formations 44 and 66 to receive each of the stop assemblies.

As perhaps best shown in FIG. 10, the drawer or supporting guides 38 are inwardly offset from the vertical front face of the assembly, which front face can be alternatively referred to as a "planar access surface," a term used in the claims appended hereto. In FIG. 10, the front exposed face of the panel 32 serves to interrupt the rearward movement of drawers inserted in the assembly, with such panel face serving to position the front face of the drawer flush with the planar access surface formed by the assembly walls. Likewise, when a door or doors are mounted on the assembly in place of drawers, the front face of the panel 32 serves to position the same so that the exterior face of the door is flush with the planar access surface of the assembly. Where the drawer supporting guide is mounted directly on the side walls of the assembly, as shown in FIG. 14, it will be understood that the front edge of such guides are positioned relative to the planar access surface so as to automatically position either the drawers or doors so as to maintain the same flush with such planar access surface.

In the form of the invention illustrated in FIGS. 1-7, a full height vertical divider 80 is mounted in the cabinet midway between the side walls 2 and 4. The divider has mounted on both faces thereof drawer guides 38 of identical construction to those previously described above and illustrated in detail in FIGS. 12 and 13. The divider is positioned relatively precisely in the interior of the cabinet both with respect to longitudinal position and the position of the divider front to rear in the cabinet, thereby accurately aligning each cooperating pair of drawer guides 38 and stop assemblies 50.

The bottom of the vertical divider 80 is provided with at least two pins 82 which extend outwardly from the bottom face of the divider. Cooperating socket member 84 are imbedded in the bottom wall 8 for receiving the pins thereby precisely aligning the bottom of the divider. The specific construction of the pin and socket is identical to the pin and socket shown in FIG. 6 and will be described below when particular reference is made to this figure.

The upper end of the divider 80 is releasably retained in the top wall 6 of the cabinet in a manner specifically shown in FIGS. 3-5 of the drawings. A metal plate 86 is mounted on one side of the divider 80 adjacent the top thereof, and is retained by screws 88. As shown in FIG. 5, an opening 90 is drilled through the metal plate and the divider for receiving a pin 92 integrally formed with or secured to a generally L-shaped bracket 94 secured to the top wall 6 of the cabinet by a screw fastener 96. When the divider 80 is swung into the vertical position for mounting the same in the cabinet the pin 92 is received in the opening 90. It will thus be seen that forces acting downwardly on the divider 80, for example when the drawers are placed in the cabinet, are transferred through the bracket 94 to the top wall 6 and thus to the entire cabinet shell to provide a rigid construction. Such transfer of force is effected, however, without a permanent connection between the divider 80 and top wall 6 so as to permit easy removal of the divider 80 as will be presently described.

A longitudinal opening 98 is bored inwardly from the top surface 100 of the divider 80, and a retractable bolt assembly generally indicated at 102 is mounted therein. The bolt assembly comprises a cylindrical casing 104 which can be press-fit in the opening 98, and a piston-like bolt 106 freely movable within the casing 104. The bolt 106 has a reduced diameter stem 108 around which is positioned a coil spring 110. The end of the coil spring remote from the bolt seats on a reduced diameter lower section of the casing 104 thereby biasing the bolt 106 outwardly of the casing as shown in FIG. 4.

Connected to the bolt stem 108 is a handle 112 having a round knob portion 114. When the handle is pulled downwardly it will be apparent that the bolt can be withdrawn within the casing 104 against the bias of the spring 110. Access for bolt manipulation is provided by a cylindrical opening 116 formed in the adjacent drawer guide 38, with the same shaped opening likewise being formed as indicated at 118 in the divider 80.

An opening 120 is provided in the top wall 6 of the cabinet for receiving the bolt 106 when the same is released.

To mount the divider in the cabinet, the bottom pins 82 are aligned with the sockets 84 formed in the bottom wall 8, with such alignment being normally effected when the divider is positioned in an inclined orientation. As the divider is then moved toward vertical, the bolt handle 112, or handles 112 if more than one bolt assembly are provided, is grasped and the bolt retracted within the top surface 100 of the divider. With the bolt retracted, the pin 92 is aligned with the hole 90 in the divider, and the divider moved until the plate 86 contacts the vertical leg of the bracket 94. With the divider 80 now in a vertical position, the bolt handle 112 is released and the bolt 106 extends into the opening 120.

When the full vertical divider 80 is desired to be removed from the interior of the cabinet, the bolt handle 112 is pulled downwardly thereby releasing the bolt 106 from the opening 120. The divider is then moved...
away from the bracket 94 thereby disengaging the pin 92 from the opening 90. Continued movement of the divider provides head room for lifting of the same to disengage the pins 82 in the bottom of the divider from the sockets 84 thereby permitting the divider to be removed.

Referring now to FIGS. 6 and 7, the front door 14 shown in FIG. 1 is likewise mounted for quick installation and removal if the cabinet is desired to be converted, for example, to an all drawer arrangement.

The door 14 is provided adjacent the bottom of the pivot end thereof with a pin 130, which can be press-fit or otherwise rigidly retained in opening 132 provided therefor in the bottom of the door. The pin 132 is formed with a reduced diameter, bullet shaped end portion 134 which is adapted to be received in a cylindrical socket 136 mounted in opening 138 formed in the bottom wall 8 of the cabinet.

Mounted in the top of the door 14 immediately above the pin 130 is a retractable bolt assembly generally indicated at 140 which can be of the same construction as the bolt assembly 102 illustrated in FIG. 4. Thus, the assembly includes a retractable bolt 142, a casing 144 which is mounted in an opening 146 formed in the door, and a bolt handle 148. As previously illustrated, a spring (not shown in FIG. 6) biases the bolt 142 outwardly into an opening 150 formed in the top wall 6 of the cabinet. An access opening 152 is formed in the inside face of the door communicating with the bolt handle 148 to permit retraction thereof.

To mount the door, the pin end 134 is placed in the socket 136 and the door moved toward a position wherein the same is generally perpendicular to the side wall 4. During such movement, the bolt handle 148 is pulled downwardly thereby retracting the bolt 142 to or inwardly of the top surface of the door. The door is then moved to a position wherein the front face thereof is generally aligned with the front faces of the top and bottom walls 6 and 8, respectively, of the cabinet and the bolt handle 148 released whereby the spring biases the bolt 142 into the opening 150. The door 14 is thereby mounted for pivotal movement about an axis through the bolt 142 and the pin 130.

To mount the door, the same is swung open for access to the bolt handle 148, and the latter pulled downwardly until the bolt 142 clears the opening 150. The door 14 is then leaned outwardly sufficiently for the top of the door to clear the top wall 6 whereupon the door can be lifted to withdraw the pin 130 from the socket 136 thereby freeing the door.

It will be noted in FIG. 7 that the inner wall of the door at the pivot side thereof is curved as shown at 160. The edge band 162 which is dove-tailed to the side wall 4 is formed with a curved inner wall 164 generally similar in curvature to the curved wall 160 of the door. The opposite end of the door is likewise formed with a curved wall portion similar to that shown at 160 whereby the door is conditioned for mounting at either side of the cabinet. Although not shown, it will be understood that the door can be maintained in a closed position by any frictional release type catch, such as, for example, by a bullet catch.

There is shown in FIG. 8 an alternative arrangement for the cabinet interior. Rather than having a single vertical divider, such as divider 8 shown in FIG. 2, the interior of the cabinet illustrated in FIG. 8 comprises a horizontal divider 170 the opposed ends of which are received in the openings 36 which space the adjacent ends of the guide panels 32 and 34 at each end of the cabinet.

As with the vertical divider, the horizontal divider 170 is provided with a releasable, yet rigid mounting on the side walls 2 and 4. Referring to FIGS. 10 and 11, the divider 170 is provided with a retractable locking bolt assembly generally indicated at 172. Although one such assembly is shown in FIGS. 10 and 11, it will be understood that two or more assemblies could likewise be provided, at one or both ends of the divider.

Each bolt assembly 172 is constructed as the assemblies previously described, comprising a retractable bolt 174, a bolt handle 176 and a coil spring (not shown) within casing 178 which normally biases the bolt 174 into an opening 180 provided therefor in the side wall 2. An access opening 182 is formed in the divider 170 communicating with the handle 176 for permitting manipulation of the same. To position the divider 170, the same is aligned with the openings 36 and moved rearwardly in the cabinet, with the bolts 174 retracted. When the front surface of the divider is generally aligned with the front edge of the guide panels 32 and 34, the bolts 174 and openings 180 are aligned, the bolt handle or handles are released thereby biasing the bolts into the openings and rigidly holding the divider in place.

To remove the divider, the procedure is just reversed. The bolts 174 are retracted by the handles 176, and the divider pulled outwardly along the openings 36 toward the front of the cabinet, with such movement continuing until the divider has been removed from the cabinet. One bolt assembly is preferably provided at each end of the divider thereby permitting a single person with both hands to remove the divider from the cabinet.

The interior of the cabinet as arranged in FIG. 8 further includes a partial vertical divider 190 which extends between the top wall 6 of the cabinet 6 and the horizontal divider 170. The partial divider 190 is preferably mounted in the cabinet in a manner similar to the full divider 80, being provided with downwardly extending pins 192 adapted to be received in sockets 194, FIG. 9, formed in the partition 170, with the upper releasable connection being identical to the releasable connection of the full divider as shown in detail in FIGS. 4 and 5. These details have been left out of FIG. 8, although it will be understood that the installation and removal of the partial vertical divider 190 corresponds to that of the full divider. The partial divider 190 can thus be placed in position or removed in a matter of seconds thereby to permit conversion of the cabinet to a functionally different use.

In the invention described, the flexibility of the present invention will be readily apparent. Numerous arrangements of components, in addition to those shown, can be made, with very quick conversion, to provide the desired storage. For example, it will be seen that in the FIGS. 1 and 2 arrangements, the door 14 could be mounted on the left of the cabinet, and the drawers 16, 18 and 20 on the right. Alternatively, the full vertical divider 80 could be removed entirely and drawers similar to drawers 16-20 but extending the full
width of the cabinet provided. In this arrangement, the door 14 would of course not be required. A still further alternative is to place shelves in the cabinet rather than drawers, in which event a pair of doors are provided for enclosing the cabinet front. Referring to FIG. 8, the partial vertical divider can be positioned below the horizontal divider 170 rather than above, as shown. The invention also contemplates the use of two or more vertical dividers to provide a cabinet having more than two vertical rows of drawers. Similarly, two or more vertically spaced doors can be provided rather than the single door shown at either or both sides of the cabinet.

Referring now to FIG. 14, there is shown therein an alternative drawer guide construction. The drawer guide is generally indicated at 200 and comprises a tongue portion 202 which is securedly mounted in a groove 204 formed in the side wall 4. The drawer guide 200 is formed with upper and lower corner recesses 206 and 208 which receive the associated portions of the drawer 16 for sliding support of the door along the guide. The drawer guide 200 is similarly provided with a retractable stop assembly generally indicated at 210 identical with the assembly 50 shown in detail in FIG. 13. By mounting the drawer guides 200 directly on the side walls 4, the need for the guide panels 32 and 34 is eliminated.

Referring to FIGS. 15 and 16, there is illustrated therein an alternative form of a releasable, pivotal mounting for the cabinet door, which is shown at 16'. The pivotal mounting of the bottom of the door is similar to the arrangement shown in FIG. 6, and corresponding parts have been shown by the same reference numerals with an attached prime. A retractable, resiliently biased pin forms the upper pivot for the door.

The top of the door is formed with an elongated opening 220 in which a flat metal plate 222 is supported by longitudinally spaced wood screws 224 and 226. The heads of the screws 224 and 226 are bevelled in conventional manner, and the plate 222 is provided with openings 228 and 230, with the side walls of such openings having bevelled surfaces corresponding to the bevelled surfaces of the screws whereby the plate effectively seats on the heads of the screws. The screws are rigidly fastened in the bottom wall 232 of the opening 220, with the degree of penetration being such as to dispose the top surfaces of the screws at approximately the same height as the top of the door 14'.

Coil springs commonly designated at 234 are disposed under the shanks of screws 224 and 226, with the opposed ends thereof engaging the bottom of the plate 222 and the bottom wall 232 thereby biasing the plate upwardly until the same is seated in its FIG. 16 position. The plate 222 carries a pin 236 adjacent one end thereof which is adapted to extend upwardly into a sleeve or socket 238 formed in the top wall 6'.

When it is desired to mount the door 14', the plate is depressed downwardly, either by finger manipulation or by a simple tool such as screwdriver or the like, until the pin 236 is withdrawn below the bottom surface of the top wall 6' and sleeve 238. The pin 130 is then inserted into the socket 136' and the pin 236 aligned with the sleeve 238. The pressure on pin 236 is then released and the pin is biased by springs 234 into the sleeve 238 to effect the pivotal connection. To remove the door, the reverse procedure is followed.

It will be noted that the plate 222 can be depressed uniformly by application of force at approximately its longitudinal mid-point. When force is applied to either side of such mid-point, the relatively distant screw serves as a fulcrum about which the plate 222 pivots. For example, if force is applied relatively adjacent the pin 236, the plate 222 will be pivoted downwardly about a horizontal axis through the head of the screw 226. In this regard, the neck portion of the openings 228 and 230 is of sufficient diameter to permit such relative movement without encountering binding of the plate on either of the screw fasteners.

The cabinet construction of the present invention may further include the provision of a drawer-contained writing surface. The only writing surface available in present laboratory cabinetry of this time is the top surface of the cabinet, which has obvious drawbacks. In accordance with the present invention, referring to FIG. 14, a drawer 16 is rabbeted on at least the top inner edge of each side wall thereof, as illustrated at 240, for receiving a flat desk top 242, which is thus fully supported by the drawer. The rabbeted drawer can be placed at the desired height in the cabinet to provide the desired desk height. The drawer area below the desk top can be fully utilized for storage, and the top is provided with a flat handle or the like (not shown) for facilitating lifting of the top.

It will thus be seen that the objects of the invention have been realized. The components of the cabinet can be arranged in almost infinite variety to satisfy a particular desire or needed function. Full or partial horizontal and vertical dividers can be provided to compartmentalize the cabinet interior to provide the storage pattern preferred, with the doors, drawers and shelves being completely interchangeable. The doors and interior components are constructed and arranged for quick and easy placement or removal, thereby permitting conversion from one storage design to another very readily. If, in such conversion, additional components are needed, these can be supplied without difficulty or great cost in view of the standardization of the cabinet interior and the components adapted to be assembled therein.

We claim:
1. An assembly of supporting components specifically designed to receive modular interchangeable components to provide drawer, shelf, and/or compartment-type storage, comprising:
   a. a plurality of supporting components interconnected to define a storage area bounded at top, bottom and opposed sides, said supporting components cooperating to define a planar access surface,
   b. a plurality of supporting guides mounted in modular relation on at least two of said supporting components comprising the sides of said assembly, the supporting guides on one of said supporting components being appropriately positioned with respect to corresponding supporting guides on the other of said supporting components to form pairs of said supporting guides, each corresponding pair of said supporting guides being adapted to receive and support either a drawer or shelf, said modular spacing of said supporting guides permitting the same to receive relatively deeper drawers having depths in modular relation to the depth of said first
mentioned drawer, said supporting guides being located with respect to said planar access surface so as to automatically position the exposed face of said drawers and/or doors flush with said planar access surface when said drawers are fully inserted or said doors are closed,
c. releasable stop means on said supporting guides adapted to limit the withdrawal of such drawers from the enclosure, said stop means being simply and quickly releasable to permit complete withdrawal of said drawers for rearrangement thereof or for changing the arrangement to an alternative storage design,
d. removable and interchangeable door means for enclosing said storage area mounted on said supporting components in the space between said planar access surface and said supporting guides,
e. said supporting components being constructed and arranged to interchangeably receive said door means at either one or both sides of said assembly, and
f. means carried by said door means for removably pivotally attaching said door means on said assembly flush with said planar access surface.

2. The assembly of claim 1 wherein said means for removably pivotally attaching said door means on said assembly comprises a lower pivot pin on said door means adapted to be received in an opening provided thereon in the supporting component which forms the bottom of said assembly, and an upper pivot pin on said door means resiliently biased into an opening formed in the supporting component which forms the top of said assembly, retraction of said pin permitting quick dismantoring of said door means to condition said storage area for alternative storage designs.

3. The assembly of claim 2 wherein said upper pivot pin of said door attaching means comprises a retractable bolt, spring means biasing said bolt outwardly of the top of said door, said bolt being formed with a handle portion for retracting said bolt within the confines of said door, the subsequent alignment of said bolt with said opening formed in said top wall, and the release of said bolt handle affecting the upper pivot pin connection.

4. The assembly of claim 1 wherein said door means are rounded on both interior, side edges thereof, said supporting components which form the side walls of said assembly likewise being dished adjacent the area of mounting of said door to facilitate full pivotal movement thereof without interference, and to permit said doors to be interchanged to either side of said assembly.

5. An assembly of supporting components specifically designed to receive modular interchangeable components to provide drawer, shelf, and/or compartment type storage, comprising:
a. a plurality of supporting components interconnected to define a storage area, said supporting components cooperating to define a planar access surface,
b. a plurality of separate supporting guides mounted in vertically spaced, modular relation on at least two of said supporting components forming the sides of said assembly, said supporting guides extending along substantially the entire depth of said two supporting components on which they are mounted, said modular spacing of said supporting guides permitting the same to receive relatively deeper drawers having depths in modular relation to the depth of said first mentioned drawer, said supporting guides being located with respect to said planar access surface so as to automatically position the exposed face of said drawers and/or doors flush with said planar access surface when said drawers are fully inserted or said doors are closed,
c. releasable stop means mounted on each of said supporting guides for limiting the withdrawal of drawers from said storage area, said stop means being simply and quickly releasable from the front of the assembly to permit complete withdrawal of said drawers for rearrangement thereof or for converting the interior of said storage area to an alternative storage design,
d. a removable, substantially vertical divider disposed in said assembly and extending substantially the full depth thereof, said divider being formed on either side thereof with supporting guides mounted in vertically spaced modular relation thereon and extending substantially the full depth of said divider, the guides on each side of said divider being appropriately positioned with respect to corresponding supporting guides on the opposed supporting component to form pairs of supporting guides to interchangeably receive shelves or drawers,
e. releasable stop means mounted on each of said supporting guides mounted on said divider for limiting the withdrawal of drawers from said storage area, said stop means being simply and quickly releasable from the front of the assembly to permit complete withdrawal of said drawers for rearrangement thereof or for converting the interior of said storage area to an alternative storage design,
the arrangement permitting drawers to be installed in the modularly desired pattern on either one or both sides of said divider flush with said planar access surface or, alternatively, a door or doors installed on one or both sides of said divider flush with said planar access surface in place of said drawers, or combinations of drawers and doors, as desired.

6. The assembly of claim 5 wherein said releasable stop means comprises a stop assembly mounted in said supporting guide, said stop assembly including a stop flange resiliently biased outwardly of said supporting guide into abutting engagement with a drawer for preventing complete removal thereof from the storage area, said flange being provided with a cam surface by means of which the flange can be moved inwardly within the confines of the supporting guide thereby permitting withdrawal of said drawer.

7. The assembly of claim 5 further including means for precisely positioning said vertical divider in said assembly, comprising a pair of fixed pins mounted on the bottom of said divider and insertable in openings provided therefor in the supporting component which forms the bottom of said storage area, a retractable bolt assembly carried by the upper end of said divider, said
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bolt assembly comprising a bolt resiliently biased outwardly into engagement with an opening formed in the supporting component which forms the top of said storage area when said divider is properly aligned, said bolt assembly further including a bolt handle accessible at the interior of the storage area for withdrawing the bolt against said resilient mounting for releasing the bolt and thus freeing the divider for removal from the storage area, a generally L-shaped flange mounted on said top of said storage area, the vertical leg of said flange having mounted thereon a pin adapted to be received in an opening formed in a plate attached to said vertical divider adjacent the top thereof, said flange serving not only to precisely align said divider front to rear in said storage area, but to transmit load placed on said divider through said pin and flange to the top of said storage area thereby relieving the force on said divider alone.

8. An assembly of supporting components specifically designed to receive modular interchangeable components to provide drawer, shelf, and/or compartment type storage, comprising:
   a. a plurality of supporting components interconnected to define a storage area, said supporting components cooperating to define a planar access surface,
   b. a plurality of separate supporting guides mounted in vertically spaced, modular relation on at least two of said supporting components forming the sides of said assembly, said supporting guides extending along substantially the entire depth of said two supporting components on which they are mounted, said modular spacing of said supporting guides permitting the same to receive relatively deeper drawers having depths in modular relation to the depth of said first mentioned drawer, said supporting guides being located with respect to said planar access surface so as to automatically position the exposed face of said drawers and/or doors flush with said planar access surface when said drawers are fully inserted or said doors are closed,
   c. a removable, substantially vertical divider disposed in said assembly and extending substantially the full depth thereof, said divider being formed on either side thereof with supporting guides mounted in vertically spaced modular relation thereon and extending substantially the full depth of said divider, the guides on each side of said divider being appropriately positioned with respect to corresponding supporting guides on the opposed supporting component to form pairs of supporting guides to interchangeably receive shelves or drawers,
   d. removable and interchangeable door means mounted on said supporting components in the space between said planar access surface and said supporting guides for enclosing at least part of said storage area,
   e. said supporting components being constructed and arranged to interchangeably receive said door means at either one or both sides of said assembly, and
   f. means carried by said door means for removably pivotally attaching said door means on said assembly flush with said planar access surface,

the arrangement permitting drawers to be installed in the modularly desired pattern on either one or both sides of said divider flush with said planar access surface or, alternatively, door means installed on one or both sides of said divider flush with said planar access surface in place of said drawers, or combinations of drawers and door means as desired.

9. An assembly of supporting components specifically designed to receive modular interchangeable components to provide drawer, shelf, and/or compartment type storage, comprising:
   a. a plurality of supporting components interconnected to define a storage area, said supporting components cooperating to define a planar access surface,
   b. a plurality of supporting guides mounted in modular relation on at least two of said supporting components, said modular spacing of said supporting guides permitting the same to receive relatively deeper drawers having depths in modular relation to the depth of said first mentioned drawer, said supporting guides being located with respect to said planar access surface so as to automatically position the exposed face of said drawers and/or doors flush with said planar access surface when said drawers are fully inserted or said doors are closed,
   c. releasable stop means mounted on each of said supporting guides for limiting the withdrawal of drawers from said storage area, said stop means being simply and quickly releasable from the front of the assembly to permit complete withdrawal of said drawers for rearrangement thereof or for converting the interior of said storage area to an alternative storage design,
   d. a removable horizontal divider removably disposed in said assembly for partitioning said storage areas vertically into first and second storage compartments,
   e. at least one removable vertical divider disposed in said assembly between said horizontal divider and a further one of said supporting components to divide the area bounded by said further component and said horizontal divider into relatively smaller storage compartments on either side of said vertical divider, said vertical divider being formed on either side thereof with supporting guides mounted in modular relation thereon, the guides on each side of said divider being appropriately spaced from corresponding supporting guides on the opposed supporting component to form pairs of supporting guides to interchangeably receive either shelves or drawers, and
   f. releasable stop means mounted on each of said supporting guides mounted on said vertical divider for limiting the withdrawal of drawers from said storage area, said stop means being simply and quickly releasable from the front of the assembly to permit complete withdrawal of said drawers for rearrangement thereof or for converting the interior of said storage area to an alternative storage design,

the arrangement permitting full width drawers or shelves to be installed flush with said planar access surface in the storage compartment in which said
vertical divider is not positioned, and permitting drawers to be installed in a modularly desired pattern on either one or both sides of said vertical divider flush with said planar access surface or, alternatively, a door or doors installed in place of said drawers or shelves on one or both sides of said vertical divider flush with said planar access surface and extending either the full height of said assembly or coextensively with the storage compartments bounded by said vertical and horizontal dividers, or combinations of drawers, shelves and doors, as desired.

10. The assembly of claim 9 further including means releasably mounting said horizontal divider in said storage area, said releasable means comprising a retractable bolt assembly provided in at least one end of said horizontal divider, said bolt assembly comprising a retractable bolt, resilient means for urging said bolt outwardly of said horizontal divider into an opening provided therefor in the supporting component which forms the side wall of said storage area, and a bolt handle for retracting said bolt against the bias of said resilient means until said bolt has been aligned with said opening, the release of said handle following the alignment of said bolt and opening affecting movement of said bolt into said opening thereby to provide a rigid, releasable connection.

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