

Sept. 20, 1971

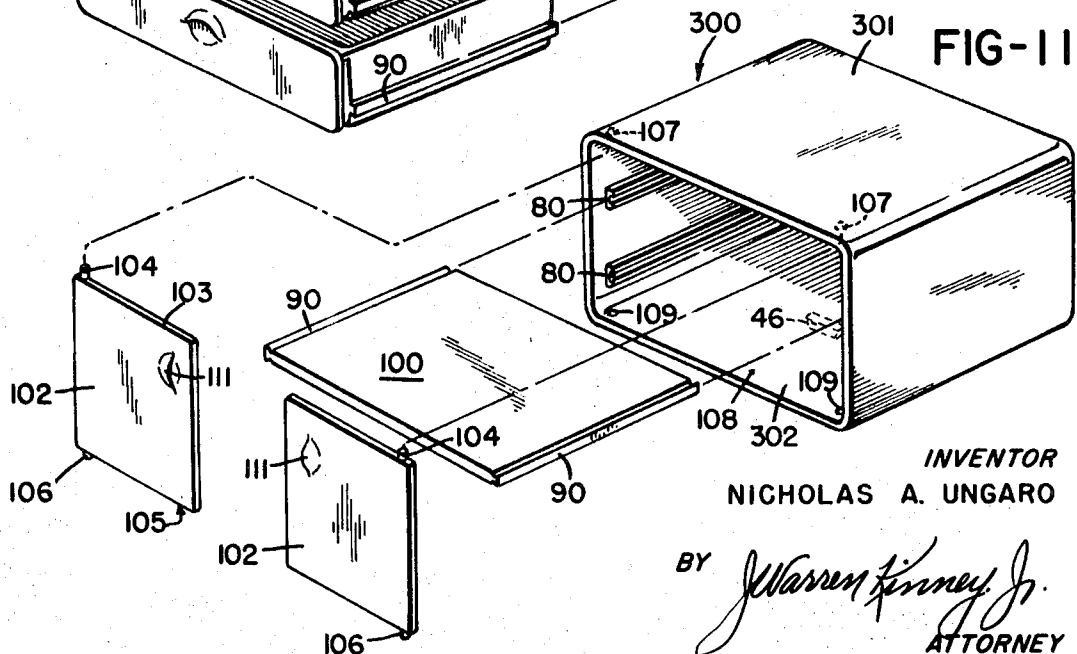
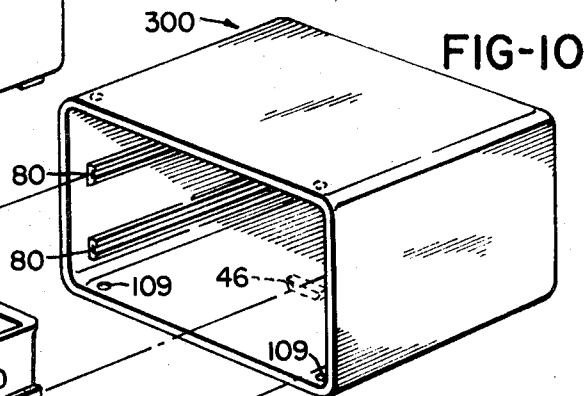
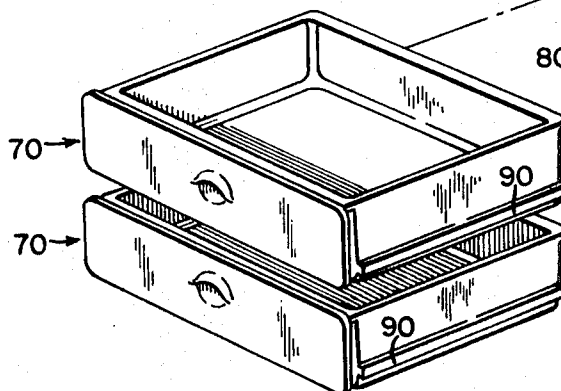
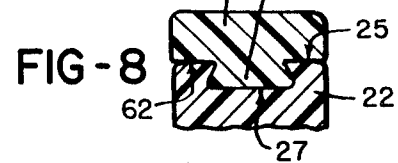
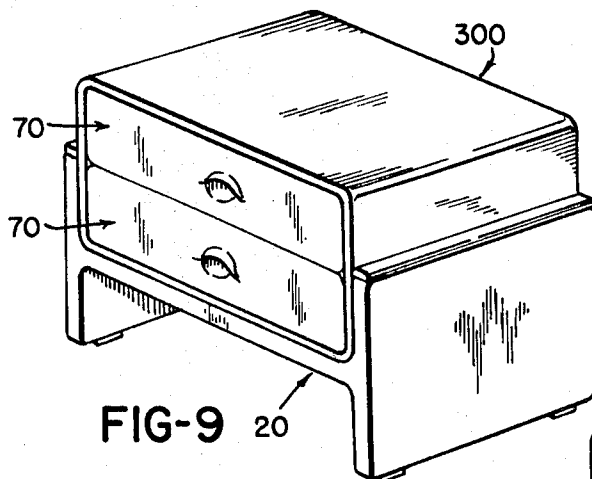
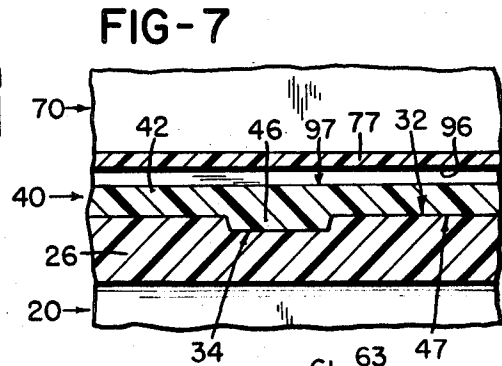
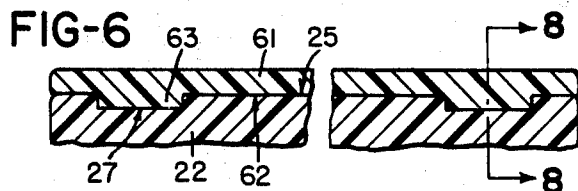
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3,606,506

MODULAR UNITS FOR FURNITURE AND CABINET CONSTRUCTION

Filed March 5, 1969

4 Sheets-Sheet 2



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MODULAR UNITS FOR FURNITURE AND CABINET CONSTRUCTION

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4 Sheets-Sheet 1

FIG-1

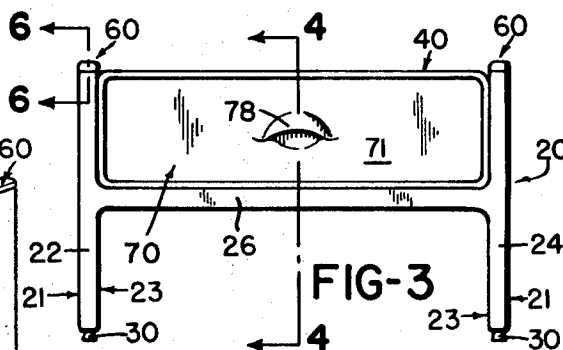
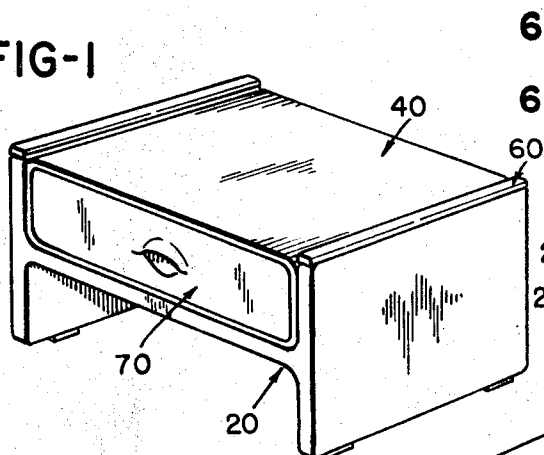


FIG-2

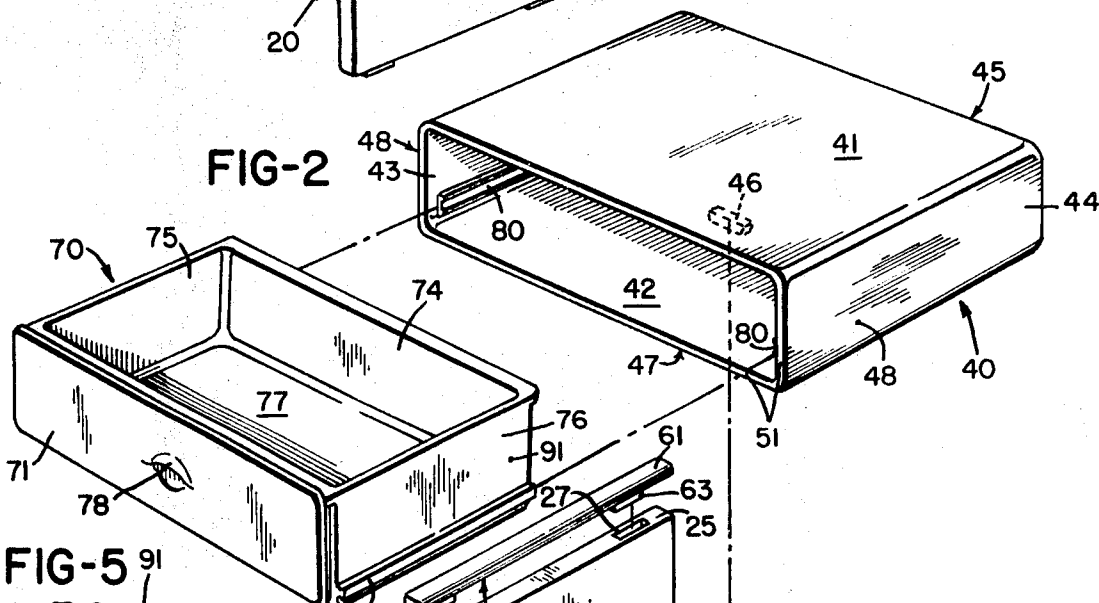


FIG-5

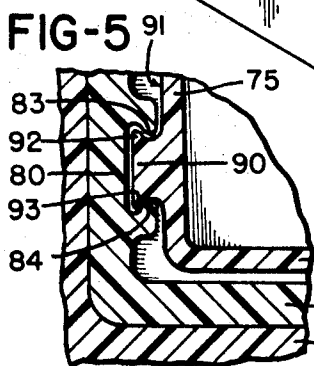
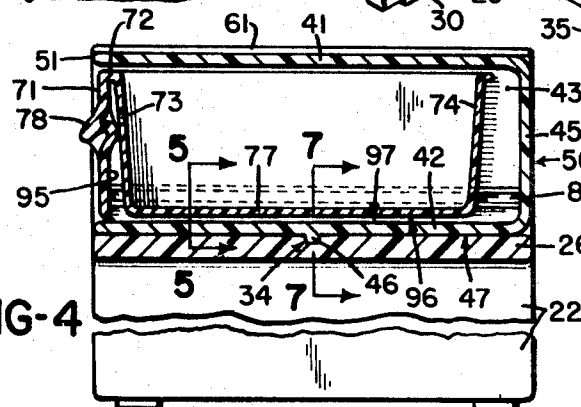


FIG-4



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4 Sheets-Sheet 3

FIG-12

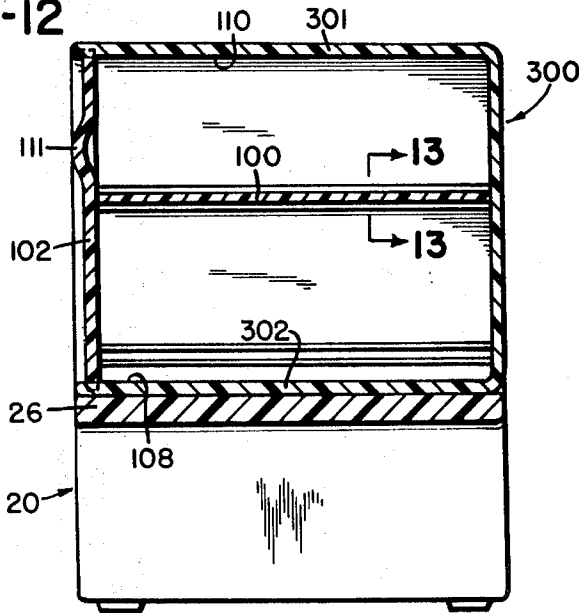


FIG-13

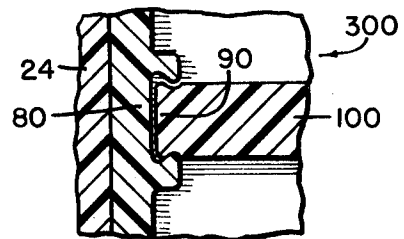


FIG-14

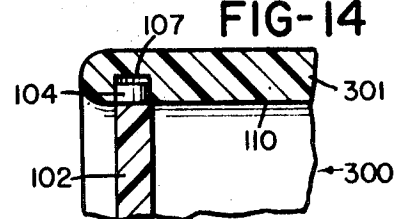


FIG-15

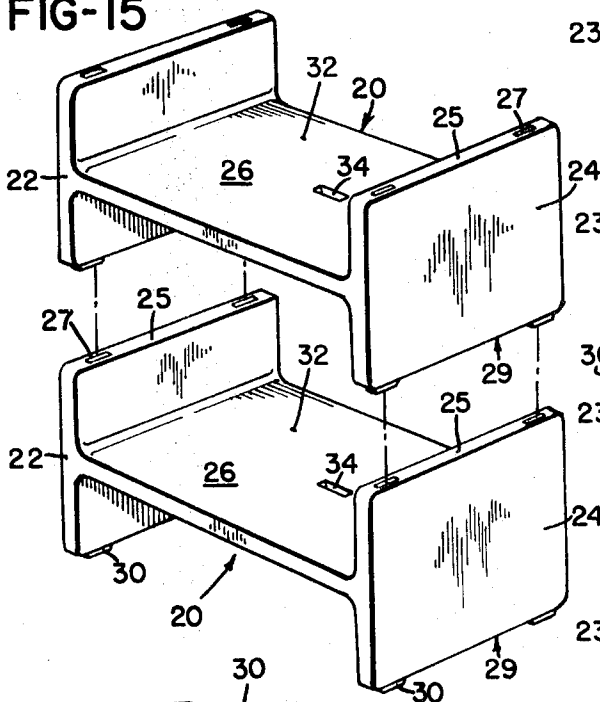


FIG-17

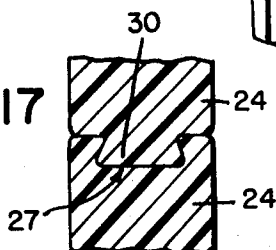
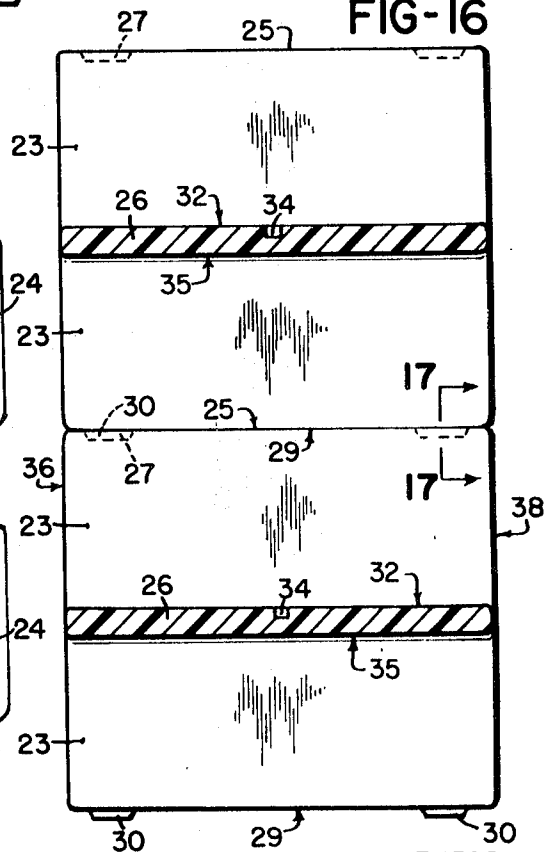


FIG-16



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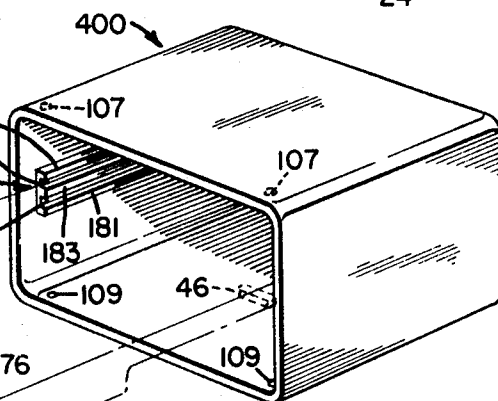
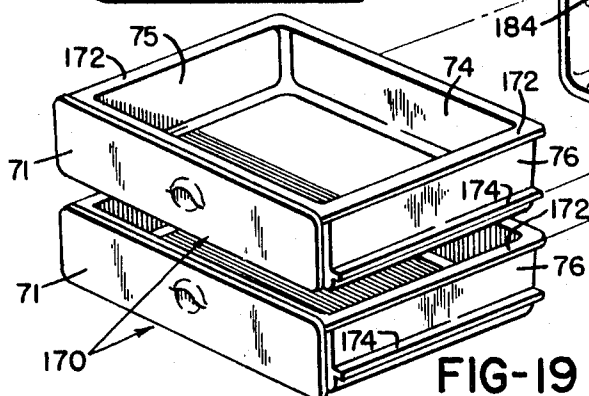
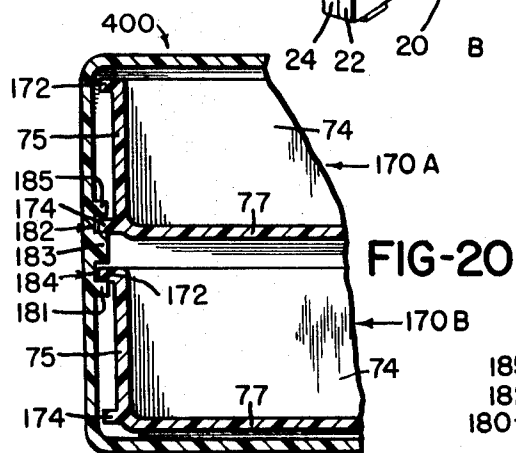
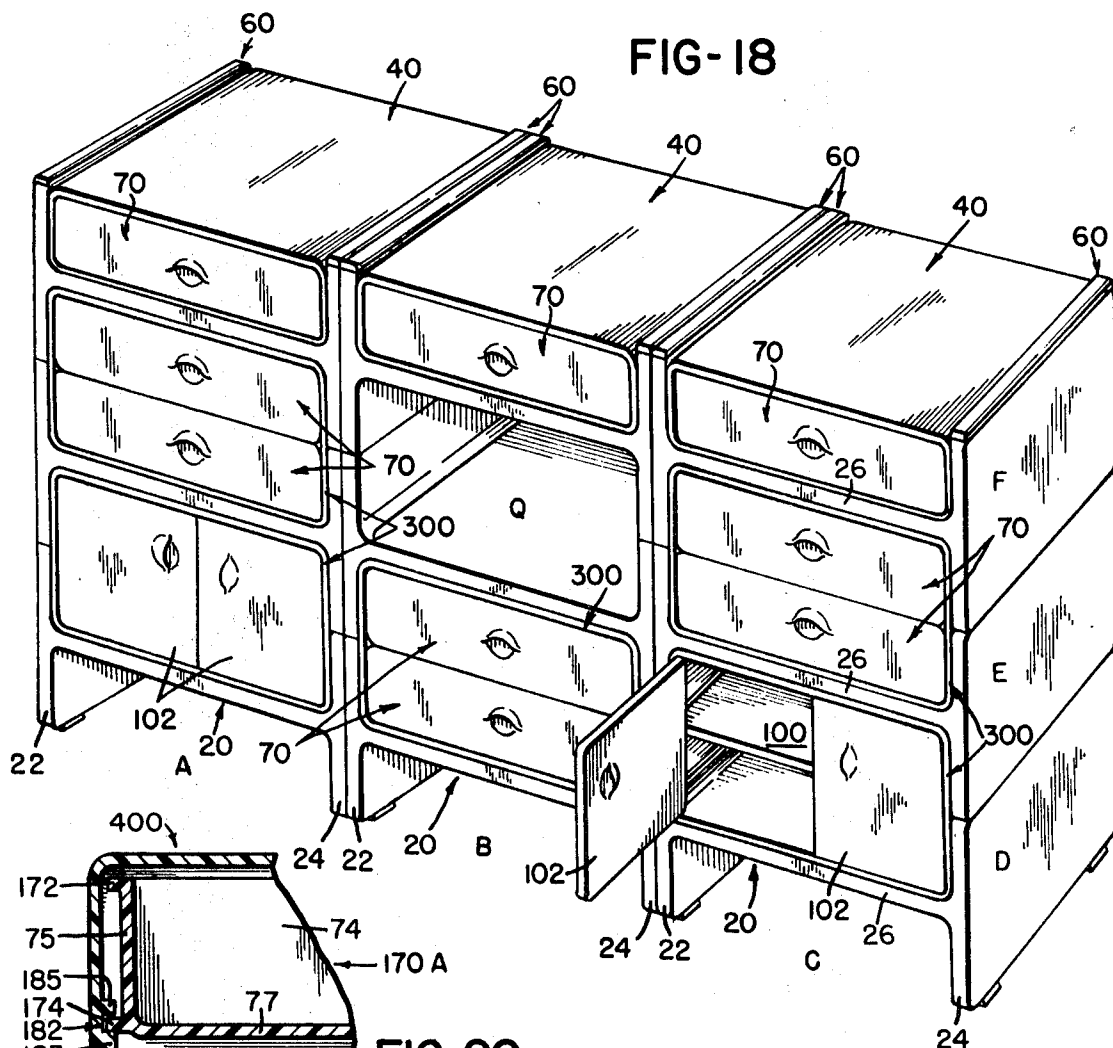
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MODULAR UNITS FOR FURNITURE AND CABINET CONSTRUCTION

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4 Sheets-Sheet 4



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1

3,606,506

## MODULAR UNITS FOR FURNITURE AND CABINET CONSTRUCTION

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Filed Mar. 5, 1969, Ser. No. 804,499

Int. Cl. A47b 77/00

U.S. Cl. 312—111

19 Claims

### ABSTRACT OF THE DISCLOSURE

A plurality of modular units, fabricated from high impact strength plastic are provided with integrally formed means for enabling the various units to be securely though releasably interlocked in the construction of furniture, cabinets and the like, using various combinations of said modular units.

This invention relates to modular units from which furniture and the like may be constructed, said units being adapted to be fabricated on a mass production basis from high impact strength plastic or the like.

An object of the invention is to provide a minimum number of basic modular units which may be utilized or associated with each other for enabling a large number of different structures to be fabricated therefrom.

Another object of the invention is to provide basic modular units which may be assembled in interlocked relationship without requiring the use of fasteners nor the use of tools.

A further object of the invention is to provide basic modular units, which are fabricated entirely from high impact strength plastic and which are free of metallic or wooden parts.

Still another object of the invention is to provide modular units having the hereinabove described characteristics and which are rugged, foolproof and reasonably priced.

These and other objects are attained by the means described herein and as illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of an assembly of four individual basic modular units of the subject invention, assembled to provide a single drawer cabinet structure having an open storage space therebeneath.

FIG. 2 is an exploded view of the various component basic modular units comprising the structure of FIG. 1.

FIG. 3 is a front plan view of the structure of FIG. 1.

FIG. 4 is a sectional view taken on line 4—4 of FIG. 3.

FIG. 5 is a sectional view taken on line 5—5 of FIG. 4.

FIG. 6 is a sectional view taken on line 6—6 of FIG. 3.

FIG. 7 is a sectional view taken on line 7—7 of FIG. 4.

FIG. 8 is a sectional view taken on line 8—8 of FIG. 6.

FIG. 9 is a perspective view, similar to FIG. 1, of a two-drawer cabinet, having an open storage space therebeneath.

FIG. 10 is an exploded view of the individual basic modular units comprising the drawers and canister unit of the assembly of FIG. 9.

FIG. 11 is an exploded view of a shelf and door assembly for the canister of FIG. 10.

FIG. 12 is a vertical sectional view of an assembly of FIG. 9 with the shelf and door construction of FIG. 11 in lieu of the drawers of FIG. 9.

FIG. 13 is a sectional view taken on line 13—13 of FIG. 12.

FIG. 14 is a vertical section of the pivotal connection between a door and the canister of FIG. 12.

2

FIG. 15 is an exploded perspective view of two modular base units which comprise the detail of the present invention.

FIG. 16 is a vertical section through a pair of assembled or fully nested base units of FIG. 15.

FIG. 17 is a sectional view taken on line 17—17 of FIG. 16.

FIG. 18 is a perspective view of an assembly of a plurality of the various individual units illustrating the versatility of the components in providing multi-purpose furniture.

FIG. 19 is a view similar to FIG. 10 illustrating a modified modified type of drawer and self suspension comprising part of the present invention.

FIG. 20 is a fragmentary vertical sectional view of the left side of the drawer and canister construction of FIG. 9 with the drawers received within the canister.

With particular reference now to FIG. 2 the numerals 20, 40, 60 and 70 denote four basic modular units of the subject invention.

The numeral 20 denotes a modular H type base unit which comprises a pair of upstanding vertically spaced end members 22 and 24 centrally interconnected by means of transverse member 26. The end members include an outer surface 21 and a pair of similar inner surfaces 23, one above and one below transverse member 26. The upper surface 25 of end members 22 and 24 is provided with spaced sockets 27 whereas the lower surface 29 of each of said end members is provided with projecting tongues 30 which are dimensioned to be received within sockets 27 of the upper surface 25 of a similar base member for securely, though releasably, securing a pair of base members to one another in vertical alignment, as in FIGS. 15 and 16.

Transverse member 26 includes an upper surface 32 provided centrally with a socket 34, as illustrated. In the preferred embodiment of the invention the socket 34 does not extend through member 26 to its under surface 35, note FIG. 16.

The depth of end members 22 and 24 and transverse member 26 from their respective forward edges 36 to their rear edges 38 is the same.

The numeral 40 denotes another type of modular unit, to wit, an open ended canister defined by upper and lower walls 41 and 42 interconnected by side walls 43 and 44 and a rear wall 45 whereby to provide an opening opposite rear wall 45.

A downwardly projecting tongue 46 is provided on the bottom surface 47 of lower wall 42, said tongue being adapted to be securely though releasably received within socket 34 in the upper surface 32 of transverse member 26 of a modular base unit 20, as in FIG. 7.

In the preferred embodiment of the invention, the overall width of a canister as defined by the lateral spacing of the outer surfaces 48 of side walls 43 and 44 is of a dimension whereby the canister may be slidably received between the inner most or adjacent surfaces 23 of end walls 22 and 24 of a base unit 20. The depth of the canister between the outer surface 50 of rear wall 45 and the forward edges 51 of walls 41, 42, 43 and 44 is preferably substantially equal to the depth of the transverse and end members of a base unit 20.

The overall height of the canister illustrated in FIGS. 1 through 4 is substantially equal to the height of inner surface 23 of the end members 22 and 24 of a base unit 20.

The numeral 60 denotes a modular cap member having a substantially flat upper surface 61 and a lower surface 62 from which a pair of tongue members 63 project, said tongue members being dimensioned to be received within sockets 27 in the upper surface 25 of end members 22 and

24, for the purpose of concealing said sockets, as best illustrated in FIGS. 1, 9 and 18.

The numeral 70 denotes a single drawer modular unit comprising an outer front or forward panel 71 connected at 72 to an inner forward wall 73, a rear wall 74, side walls 75 and 76 and a bottom wall 77. The numeral 78 denotes a hand grip formed in front panel 71.

With particular reference now to FIGS. 2 and 5, the numerals 80 denote tracks which are formed integrally with the inner surfaces of the side walls 43 and 44 of the canister. Each track 80 includes and is defined by a pair of vertically spaced upper and lower guide members 83 and 84 which extend outwardly of, that is, they project from their respective side wall surfaces.

The numeral 90 denotes a follower provided integral with and lengthwise of the outer surface 91 of the side walls 75 and 76 of the drawer, said follower having portions 92 and 93 which are complementary to and dimensioned for cooperation and the upper and lower guide members 83 and 84 of track 80 whereby 70 may be slidably received within a canister 40.

It will be noted that the forward or outermost end of track 80 terminates inwardly from the forward, open ends of side walls 43 and 44 of the canister, said forward ends being engaged by rear surface 95 of the forward panel 71 of the drawer, as clearly illustrated in FIG. 4. In this manner the fully closed position of drawer 70 relative to its associated canister is effectively established.

As best illustrated in FIG. 7, the lower surface 96 of the bottom wall 77 of drawer 70 is spaced from and above the upper surface 97 of the lower wall 42 of its associated canister 40.

With reference to FIG. 8 it will be noted that the side edges of tongues 63 may be tapered outwardly whereby to interlock with complementary shaped side walls of the sockets 27 in the upper surface 25 of the end members of the base units 20.

In FIG. 9 the numeral 300 denotes a modular canister which is similar in all respects to canister 40 of FIGS. 1 through 4 except that it is twice as high and, as illustrated in FIG. 10, it is provided with two sets or pairs of tracks 80, one for each of drawers 70.

In FIG. 11 I have illustrated a canister 300 in association with the shelf member 100 and a pair of doors 102. The opposite side edges of shelf 100 are provided with followers 90 similar in design to followers 90 on the side walls of drawers 70.

Each door 102 is fabricated from rigid plastic with upper and lower hinge-forming bosses 104 and 106 projecting outwardly from the upper and lower edges 103 and 105. The bosses are dimensioned for pivotal mounting within sockets 107 and 109 provided respectively in the lower and upper surfaces 108 and 110 of the upper and lower walls 301 and 302 of canister 300.

Each of the doors 102 may be hingedly secured to a canister by transversely flexing said doors about their upper and lower edges by an amount to permit reception of bosses 104 and 106 wherein their respective sockets 107 and 109 of the canister 300. Each door may be provided with an integrally formed hand grip portion 111 as illustrated in FIGS. 11 and 12.

In FIG. 13 I have illustrated, on an enlarged scale, the manner in which shelf 100 is slidably received within track element 80 of the canister.

In FIG. 14 the relationship between boss 104 of door 100 and socket 105 in the upper inner surface of top panel 301 of canister 300 has been illustrated.

FIGS. 15, 16 and 17 illustrate the manner in which a pair of modular base units 20 are interconnected such as, by way of example, when providing the various assemblies as illustrated in FIG. 18.

With particular reference now to FIG. 18, I have disclosed the aforesaid modular units assembled in three vertical tiers designated A, B and C. Vertical tier C has been assembled by placing a canister 300 on transverse

member 26 of the lowermost base member D with tongue 46 of the canister received within socket 34 of transverse member 26 for thereby securely though releasably locking the canister relative to base unit D.

Next, a base unit E is lowered downwardly over the upper portion of canister 300 for disposing the lower surface 29 of upper unit E (see FIG. 15) in abutting relationship with upper surface 25 of lower unit D and with the tongues 30 of upper unit E received in interlocking relationship with sockets 27 provided in the upper surface 25 of lower base unit D.

A canister 300 is then placed on transverse member 26 of base member E with tongue 46 received within and engaging socket 34 of transverse member 26 of base member E.

Base member F is then associated with base member E in the same manner in which base member E was initially associated with base member D.

A single drawer canister 40 was then associated with transverse member 26 of uppermost base member F to which it is secured against accidental or unintentional displacement by reason of the inter-engagement of tongues 46 and sockets 34.

Tier C was completed by inserting a shelf 100 in the track means of the lowermost canister 300 after which doors 200 were associated with said canister—or, if desired the shelf 100 and drawers 102 may be already associated with canister 300 at the time when it is associated with lower base member D.

Drawer units 70 are associated with the upper canister 300 and the topmost canister 40 after which cap strip 60 may be associated with the upper ends of the side walls of the uppermost base member F.

In tier B a canister has not been associated with base members E and F, as in tiers A and C, for thereby providing an area Q open at opposite ends and which extends from the upper surface of transverse member 26 of base member E to the lower surface of transverse member 26 of base member F.

It should, of course be fully understood that FIG. 18 has been presented merely for the purpose of illustrating typical furniture and/or cabinet units which may be fabricated from the various modular units of the present invention; it being understood that any number of other combinations may be constructed from the basic modular units.

With particular reference now to FIGS. 19 and 20 the numeral 400 denotes a two-drawer canister having an overall dimension similar to those of canister 300 of FIG. 10, including sockets 107 and 109 for the reception of bosses 104 and 106, respectively of doors 102 (of FIG. 11).

The numeral 180 denotes a centrally disposed double track assemblage which comprises an upper track 182 and a lower track 184 defined by members 181, 183 and 185 respectively. The track assemblage 180, like track assemblage 80 of FIG. 11, is preferably formed integral with the inner surface of each of the side walls of the canister.

The numerals 170 denote drawers which include an outer front wall 71, a rear wall 74, side walls 75-76 and a bottom wall 77. The drawers of FIGS. 19 and 20 differ from the drawers of FIGS. 2, 5 and 10 in that the side walls 75 and 76 are provided with or terminate in an upper, outturned track follower 172 and a lower outturned track follower 174, adjacent the lower end of the side walls. The said followers are formed integral with their respective side walls.

As clearly illustrated in FIG. 20, the lower track follower 174 of upper drawer 170A is received within track 182 whereas the upper track follower 172 of lower drawer 170B is received within lower track 184. It should be fully understood that the disclosed structure permits the drawers to be interchanged since either drawer may be slidably associated with a canister from upper followers 172 or lower followers 174.

5

It should be further understood that shelf 100 may be associated with the upper or lower tracks 182-184 of the track assembly 180.

What is claimed is:

1. A structure comprising the combination of at least one of each of the following modular units:

- (a) an H-type base unit comprising a pair of vertically disposed, laterally spaced end walls interconnected in upstanding relationship by an integrally formed transverse member,
- (b) said end walls and transverse member each having upper and lower surfaces,
- (c) means on the upper and lower surfaces of said end walls capable of securely though releasably interconnecting them with end walls of similar base units,
- (d) a canister, open at one end, comprising upper and lower walls, a pair of side walls and a rear wall,
- (e) said canister dimensioned to be received between the upstanding end walls of a base unit and supported on the transverse member thereof.

2. A structure as described in claim 1 wherein means are provided in the lower wall of the canister for engagement with complementary means formed in the upper surface of the transverse panel of a base unit for precluding accidental or unintentional relative movement between the canister and base unit.

3. A structure as called for in claim 1 which includes a drawer comprising bottom, front, rear and spaced side walls, said drawer dimensioned to be received within the open end of the canister.

4. A structure as called for in claim 3 wherein the side walls of the canister and drawer are provided with means slidably supporting the drawer from the side walls of the canister with the bottom wall of the drawer in spaced relationship with the lower wall of the canister.

5. A structure as described in claim 1 wherein the inner surface of the side walls of the canister are provided with integrally formed elongate tracks.

6. A structure as described in claim 3 wherein the outer surface of the side walls of the drawer are provided with integrally formed elongate track followers.

7. A structure as described in claim 3 wherein the inner surface of the side walls of the canister are provided with integrally formed elongate tracks and wherein the outer surface of the side walls of the drawer are provided with integrally formed elongate track followers engageable with the tracks of the canister for slidably supporting a drawer relative to a canister.

8. A structure as described in claim 5 which includes a shelf having side edges engageable with the tracks of the canister.

9. A structure as described in claim 1 which includes a pair of doors for the open end of the canister, wherein said doors are hingedly secured to and between the upper and lower walls of said canister.

10. A structure as called for in claim 1 which includes a pair of elongate cap members each dimensioned to overlie the upper surface of an end wall of a base unit, each of said cap members including an upper and a lower surface, and means securely though releasably connecting the lower surfaces of each cap member to the upper surface of an end wall of a base unit.

11. A structure as called for in claim 10 wherein the connecting means comprises at least one member which projects from the lower surface of the cap member, and at least one socket in the upper surface of an adjacent underlying end wall of the base unit.

6

12. A unit as called for in claim 1, wherein the means for interconnecting similar base units comprises socket means in the upper surface of the end walls of the base unit and projecting members in the lower surface of said end walls which are the complement of the sockets in the upper surface of said end members.

13. The drawer as defined in claim 6 wherein the upper portion of the front wall is turned outwardly thence downwardly for providing a depending outer wall, a hand grip formed integral with said outer wall, and wherein the overall width of said outer wall is substantially equal to the overall width of the open end of a canister.

14. A structure as called for in claim 1 wherein each of the modular units are fabricated by molding from high impact strength plastic.

15. A modular H-type construction unit comprising a pair of vertically disposed, laterally spaced end walls interconnected in upstanding relationship by an intermediate, integrally formed transverse member, wherein said transverse member and each of said end walls include flat upper and lower surfaces, wherein the upper and lower surfaces of said end walls include interlocking means adapted to connect with interlocking means on the end walls of similar base units to securely though releasably connect them together, and a canister open at one end dimensioned to be received within the said vertically disposed laterally spaced end walls and supported on said integrally formed transverse member.

16. A structure as called for in claim 3 wherein the side walls of the canister are of such a height as to receive a pair of drawers and wherein the side walls of the canister and each of said drawers are provided with means slidably supporting the drawers from the side walls of the canister.

17. A structure as called for in claim 1 wherein each of the side walls of the canister are provided with a pair of integrally formed, parallel, vertically spaced upper and lower elongate tracks.

18. A structure as described in claim 3 wherein the upper edge of the outer surface of each of the side walls of the drawer are turned outwardly forming track followers thereon and wherein a second integrally formed elongate track follower is provided on each side wall at the lower portion thereof.

19. A structure as described in claim 3 wherein the inner surface of each of the side walls of the canister are provided with a pair of integrally formed, elongate, vertically spaced tracks substantially midway of the height of said side walls, and wherein the outer surface of each of the side walls of the drawer are provided with a pair of integrally formed elongate track followers, one along the upper end of the side walls, the other along the lower end of the side walls, said track followers engageable with the tracks of the canister for slidably supporting the drawers relative to the canister.

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JAMES C. MITCHELL, Primary Examiner

U.S. Cl. X.R.

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