June 24, 1969 E. J. OSTLING ET AL 3,451,362

FURNITURE CONSTRUCTION HAVING YIELDABLE RECESSED FASTENING MEANS

Filed Sept. 20, 1967

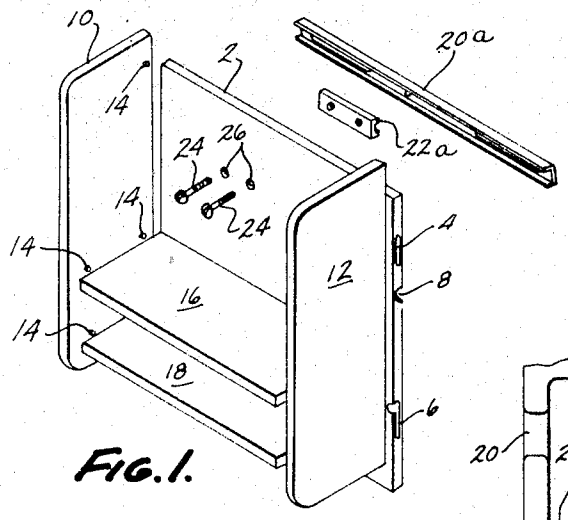


FIG. 1.

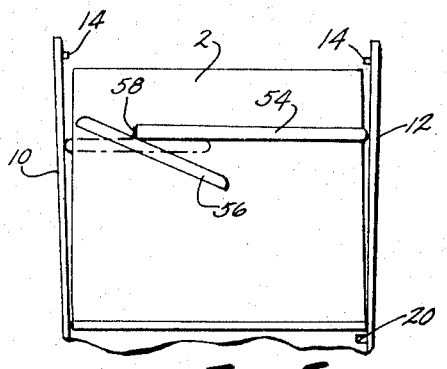


FIG. 5.

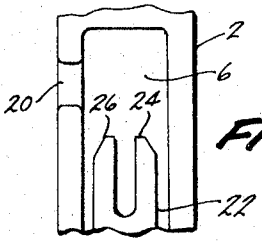


FIG. 7.

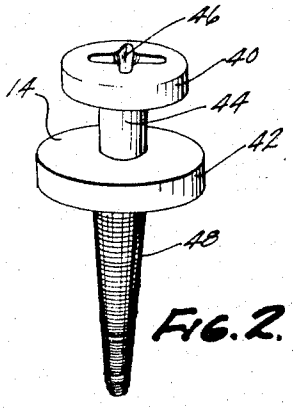


FIG. 2.

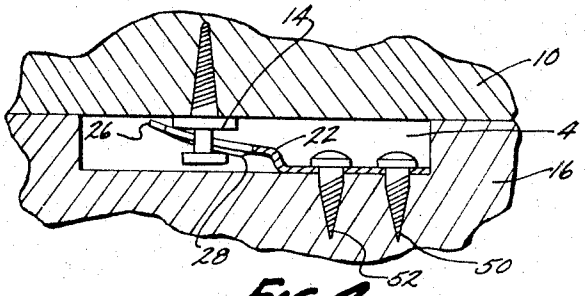


FIG. 4.

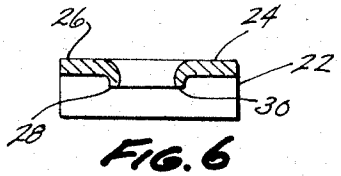


FIG. 6.

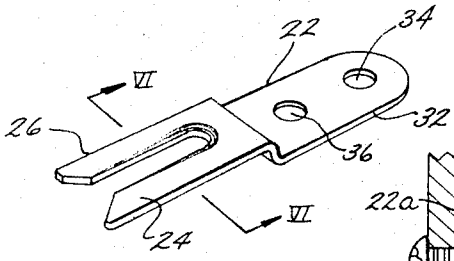


FIG. 3.

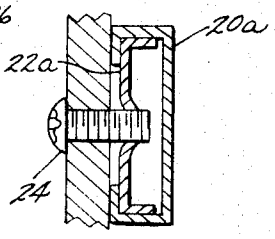


FIG. 8.

INVENTORS
EDWARD J. OSTLING
FRANK R. GAVINSKI
BY PHILIP C. WELCH
Price, Heneveld, Huizenga & Cooper
ATTORNEYS

United States Patent Office

3,451,362

Patented June 24, 1969

3,451,362

FURNITURE CONSTRUCTION HAVING YIELDABLE RECESSED FASTENING MEANS

Edward J. Ostling, Muskegon, and Frank R. Gavinski and Philip C. Welch, Grand Rapids, Mich., assignors to Modular Systems, Inc., Muskegon, Mich., a corporation of Michigan

Filed Sept. 20, 1967, Ser. No. 669,155
Int. Cl. A47b 55/00, 3/06, 47/00
U.S. Cl. 108—60 16 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a furniture construction containing a back wall, two side walls, and at least one shelf. The walls and shelf or shelves are attached through slotted clips which are recessed in the ends of the back nwall and the shelves, and through double head screw members which are attached to the side walls and fit into the slotted clips.

The clips are so shaped and positioned in the recessed portion of the members that as the screw heads slide in the slots, the joints are wedged into tight contact. The clips preferably have flexible arms which form the slot. The structure is so assembled with or without the use of an expanding tool for the walls to produce a structure which has no visible indication of fastening means.

This invention relates to furniture construction. In one of its aspects it relates to a novel furniture construction in which a back wall, two side walls, and at least one shelf between the side walls, are assembled with recessed yieldable fastening means for the members comprising slotted clips in one of each of the joining members and screw members attached to a juxtaposed member and positioned in said slotted clips, whereby the structure has no external means of attaching the members together.

In the construction of modular or unit wall hanging members, such as booths, for example, it is desirable to assemble the structure as simply as possible with a minimum of operations. It is also desirable to conceal the means of construction to make the unit more aesthetically pleasing and also to protect the unit from unauthorized disassembly. These features are especially important with telephone booths, which are, in many instances, in unprotected areas where vandalism and pilfering are common. Generally, telephone booths must be easily constructable and have strong construction, whereby the means for the construction is hidden from ordinary view.

I have now discovered a furniture construction for a modular telephone booth, and the like, containing the back wall, two side walls, and at least one shelf, the walls and shelf being so constructed that the fastening means employed are yieldable and are not visible. The construction is strong, yet the connections are flexible to facilitate rapid construction.

By various aspects of this invention, one or more of the following or other objects can be obtained.

It is an object of this invention to provide a modular wall unit for telephone booths and the like.

It is a further object of this invention to provide a booth construction which is simple, rapid, and yet strong.

It is a further object of this invention to privide an improved booth structure, wherein the means for joining the members are hidden from view when the construction is complete.

It is yet another object of this invention to provide a tightly secured joint structure which is strong and flexible to facilitate construction of furniture units.

It is still another object of this invention to provide a modular booth unit which is easily and quickly constructed by one person with simple tools.

Other aspects, objects, and the several advantages of this invention are apparent to one skilled in the art from a study of this disclosure, the drawings, and the appended claims.

According to the invention, there is provided a furniture construction comprising a back wall, side walls, and at least one shelf between the side walls, and fastening means between the side walls, and the back wall and shelf, the fastening means being recessed in the joints and comprising slotted clips in one member and screw members attached to an adjoining member and positioned in the slotted clips, whereby the structure has no visible means of attaching the members together.

Preferably, the back wall and the shelves are positioned between the two side walls. The clips are of flexible construction and preferably recessed in the ends of the shelf and back wall to facilitate assembly and disassembly of the unit.

The invention will now be described with reference to the accompanying drawings in which:

FIG. 1 is an exploded view of the embodiment of an invention;

FIG. 2 is a perspective close-up view of a screw member employed in the construction fastening means;

FIG. 3 is a perspective view of the slotted clip members employed in the construction of the embodiment shown in FIG. 1;

FIG. 4 is a sectional view of a joint structure employing the clip of FIG. 3 and the screw member of FIG. 2;

FIG. 5 is a front elevational view of the unit as it is being constructed showing the expanding tool and the method of attaching the back wall to the side walls;

FIG. 6 is a sectional view taken along lines VI—VI of FIG. 3;

FIG. 7 is a partial end view of the back wall of FIG. 1, showing a recessed portion with a clip in the recess; and

FIG. 8 is an end view of the means employed for attaching the unit shown in FIG. 1 to the wall.

Referring now to the drawings, there is provided a modular wall construction comprising a back wall **2**, side walls **10** and **12**, and shelf members **16** and **18**. The back wall has recessed portions **4** and **6** in the end thereof, and a longitudinal slot **8** extending horizontally across the back surface thereof. When constructed, the recessed portions **4** and **6** are aligned with double headed screw members **14** (shown more fully in FIG. 2) and contain clips such as those shown in **22** which engage the screw members shown in FIG. 2. Each wall member has at least six screw members **14**: two for the back wall, and two for each shelf member. Each of the shelves has at least two recessed portions like **4** containing clips like **22** for engaging the screw members **14**.

The unit is attached to the wall through a sliding rail member **20** which is bolted to the wall and through a bar **22***a* which is slidably engaged by rail **20***a* and is fastened in slot **8** through bolts **24** which extend from the front surface of back wall **2** through holes **26**. As seen in FIG. 8, the bolts **24** extend through bar **22***a* and draw the bar against the flanges of the rail **20***a* to prevent movement of bar **22***a* within rail member **20***a* after the desired location has been established.

The screw members used in the embodiment shown in FIG. 1 are preferably of like construction to those which are shown in FIG. 2. The screw member **14** has head **40** and head **42** with a connecting shaft **44**. Head **40** is provided with a suitable screwdriver engaging aperture **46** in order to fasten the screw member **14** in

place through threads **48** into the faces of side walls **10** and **12**.

The clip disposed in the recessed portions of the end walls and the recessed portions of the shelves, is shown in FIG. 3. The clip **22** contains a fastening surface **32** having holes **34** and **36** for engaging the clips into the bottom of recessed slots through screw members. The clip has a pair of cantilevered raised arms **24** and **26** which preferably extend upwardly at an angle to the plane of engaging portion **32**. As can be seen in FIG. 6, the inner portion of the slot between arms **24** and **26** contain tapered surfaces **28** and **30** for wedging between the heads of screw member **14** and for drawing the screw further into the recess.

As can be seen in FIG. 4, as the screw member **14** is forced to the right and into the slot between arms **24** and **26**, the tapered surfaces of **28** and **30** and the pitch of the arms **24** and **26** (with respect to the plane of the end surface) pull screw member **14** downwardly with respect to the clip, and thereby force the screw containing member, such as **10**, against the recess and clip containing members, such as **16**. As can be seen in FIG. 4, screws **51** and **52** fasten the clip retaining surface to the bottom of recess **4**. As is also obvious from FIG. 4, arms **24** and **26** extend upwardly at an angle to the plane containing the outer surface of member **10** and member **16**. Thus, the sliding of the screw member **14** into the slot in clip **22** draws member **10** tightly against member **16**. Clip **22** holds the members together with a strong spring tension, permitting expansion and contraction of the joint. In a preferred embodiment, the ends of arms **24** and **26** are forced against the outer surface of member **10**. The degree of tension between members **10** and **16** is determined by the depth of recess **4**. In this manner, the structure can be made as permanent as desired. For example, if the depth of recess **4** is increased to about .025 inch the two walls will be virtually inseparable without extreme force or permanent damage.

One of the slots **6** in each end of back wall **2** contains a notch **20** which extends onto the planar surface of wall **2**. The slot is large enough to permit a protruding screw member **14** on either side wall **10** or **12** to pass through the notch **20** while the ends of the back wall are flat against the side walls **10** and **12**.

The booth is simple in construction. The end wall, side walls and shelves can be supplied from the manufacturer with recessed portions cut, clips in the recessed portion and screws placed on the side walls as shown in FIG. 2. The back wall can also be provided with the horizontal groove **8**.

In assembling the booth structure, rail member **20** is first attached to the wall. Bar member **22***a* is then attached to rail member **20***a*. The back wall **2** is then attached to the supporting wall by positioning the rail in the slot **8** and attaching bolts **24** as shown in FIG. 8. The slot **8** is longer than rail member **20***a* to permit lateral adjustment after the unit is completed. The side walls **10** and **12** are then attached to shelves **16** and **18** by attaching the shelves first to one side wall member, for example **12**, and then sliding the other wall member **10** in place. The side walls are then rigidly attached to the shelf members through the interlocking screws and clips. The shelves and side walls are then lifted and the unit is positioned so that the bottom screw members **14** on side walls **10** and **12** pass through notches **20** on either side of back wall member **2** into recesses **6**. At this point, the back wall member **2** will be between the side walls **10** and **12** with screw members from side walls **10** and **12** positioned within the slots **6** in the ends of the back wall **2**. This position will be similar to that shown in FIG. 5. It can be seen that the top screw members **14** in the side walls **10** and **12** will be positioned above the top of back wall **2**. In order to position these top screw members **14** into slots **4** in the top portion of back wall **2**, it is necessary to spread apart the side walls **10** and **12**. This spreading is conveniently done by an expanding tool comprising bar members **54** and **56** attached through a hinge at **58**. The operation of this tool is indicated by phantom lines. Once the walls are spread apart as shown in FIG. 5, the side walls can be moved downwardly with respect to back wall **2**, thereby positioning the upper screw members **14** adjacent slots **4** in the back wall. The expanding member is then removed and the side walls **10** and **12** come closed against the end of back wall **2**. Further movement downwardly of the side walls with respect to the back wall **2**, will cause upper and lower screw members **14** to engage the clips in recesses **4** and **6** to produce a locking joint such as that shown in FIG. 4. A telephone can then be attached to the back wall in such a way as to cover bolts **24**. The telephone is preferably positioned just above the top shelf to prevent the sides from being lifted upwardly.

As is obvious from the foregoing description, the end of slot **8** will be hidden from view by the side walls **10** and **12**. Thus, the unit cannot be slid off the wall, due to the fact that the end walls **10** and **12** will abut against the edges of the rails **20**. Further, when a bank of booths are attached to the wall, the clearance between the ends of the rail **20***a* and the slot **8** permits the booth to be positioned directly against an adjacent booth after assembly despite the fact that a small clearance is required to assemble each booth.

The notch **20** in the back wall is so placed that when the screw members **14** engage the fastening clips **22**, the notch will be behind shelf **16**.

The shape of the clips is important in constructing the unit. The clips must be somewhat flexible or yieldable in order to allow the side walls **10** and **12** to expand outwardly to allow the back wall to be connected to the side walls. The above described spreading of the side walls is due at least in part to the flexible or yieldable nature of the clip structures.

As can be seen from the foregoing disclosure, none of the means for constructing the joints are visible to the eye after the unit has been constructed. Furthermore, the disassembly of the unit will not be possible when a telephone is mounted slightly above the top shelf. For example, in order to disassemble the unit, the side walls **10** and **12** must be raised relative to the back. This raising will not be possible since the top shelf will abut against the telephone.

Whereas the invention has been described with reference to two shelves positioned at the bottom portion of the booth, it is obvious that other constructions, such as one or more shelves at the top of the booth, or one or more shelves at the bottom of the booth can be provided within the scope of the invention. Also, it is within the scope of the invention to provide a booth with only one shelf.

Whereas the invention has been described with relation to a booth which can be attached to a permanent wall, it is within the scope of the invention to provide a booth which can be attached to a supporting stand which in turn is attached to the floor. In such a construction, the side walls of the booth can be attached to supporting members which in turn are attached to supporting legs. In this construction, the wall attaching means need not be provided.

Reasonable variation and modification are possible within the scope of the foregoing disclosure, drawings without departing from the spirit of the invention.

We claim:

1. In a furniture construction comprising two side wall members, a back wall member between said side wall members, and at least one shelf member between side walls, the improvement which comprises yieldable recessed fastening means between said shelf member and said side walls and recessed fastening means between said back wall and said side walls, said yieldable fastening means between said shelf member and said side wall being yield-

able so as to permit spreading of said side walls away from said shelf member to permit insertion of said back wall and engagement of said recessed fastening means between said back walls and said side walls whereby a booth can be constructed without a visible means of securing together said back wall member, said side wall members, and said shelf member.

2. A furniture construction according to claim 1 wherein said yieldable recessed fastening means comprises slotted yieldable clips in one member and screw members attached to adjoining members positioned in said slotted clips.

3. A furniture construction according to claim 2, wherein said slotted clips are open-ended slotted clips.

4. A furniture construction according to claim 2, wherein at least a portion of said slotted clips are attached in recessed portions of one member and spaced beneath the surface of said member.

5. A furniture construction according to claim 1 wherein said recessed fastening means between said back wall and said side walls comprise recessed areas formed in the side edges of said back wall, slotted clips fixed in said recessed areas of said back wall side edges, and screw members fixed to face portions of said side walls, said screw members having heads projecting out of said face portions and engageable with said slotted clips fixed in said recessed areas of said back wall side edges.

6. A furniture construction according to claim 1 wherein there are two parallel, spaced shelf members between said side wall members, each of said shelf members being fixed to said side wall members by yieldable, recessed fastening means.

7. A furniture construction according to claim 5, wherein each side edge portion of said back wall adjacent said side walls contains at least two recessed portions containing said clips, one of said recessed portions being in the vicinity of a shelf attached to said side walls and containing a notch in the front face of said back wall, whereby said one of said screw members protruding from said side wall can enter said one recessed portion of said side wall through said notch, and wherein said notch is aligned behind said shelf when said screw member is positioned within said clip in said one recessed portion.

8. A furniture construction according to claim 7, wherein another of said recessed portions in said end of said back wall is spaced from said shelf.

9. A furniture construction according to claim 8, wherein there are two shelf members, each shelf member containing at least two recessed portions containing open-ended clips within each end thereof, and said side walls contain said screw members positioned so as to be insertable into said clips to firmly hold said shelves in place.

10. A furniture construction according to claim 1, wherein there is further provided a groove extending across the back portion of said back wall, a rail member is positioned in said groove, a bar member slidably engaged by said rail member and attached to said back wall,

said rail member is attached to a supporting structure so that said groove is not visible when said furniture is assembled and attached to said supporting structure.

11. A furniture construction according to claim 10 wherein said bar member is attached to said back wall through at least one screw which draws said rail member tightly against said back wall to hold said rail member in fixed relation to said bar member.

12. A furniture construction according to claim 9 wherein said rail member is laterally slidable within said groove, said groove is longer in length than said rail member so that said furniture is laterally adjustable after the same has been constructed.

13. A joint structure for furniture and the like comprising a first wall member; a second wall member abutting said first wall member and having a recessed portion opening into the joint between said first and second wall members, an open-ended, slotted flexible clip positioned within said recessed portion and attached to one of said first and second wall members, a screw member having a head engageable with said clip and positioned within said clip, said screw member being attached to the other of said first and second wall members so as to pull said first and second wall members together.

14. A joint structure according to claim 13 wherein said clip is bifurcated and positioned at an angle to the plane between said first and second joint structure such that as said screw member is slid into said clip, said first wall member is positioned tightly against said second wall member.

15. A joint structure according to claim 13 wherein said clip is attached to the bottom of said recessed portion, said screw member is attached to first wall member, said clip is bifurcated and spaced from the surface of said second member.

16. A joint structure according to claim 15 wherein said clip is so-shaped and positioned that when said screw member is positioned in the innermost portion of said clip, the free ends of said clip will abut against the outer surface of said first wall member.

References Cited

UNITED STATES PATENTS

2,427,012	9/1947	Lum	211—90 X
2,438,051	3/1948	Hennessey	248—239 X
3,190,243	6/1955	Pira	108—152
3,265,344	8/1966	Ornstein	108—152 X
3,295,474	1/1967	Ornstein	108—152
3,362,610	1/1968	Van Dyke	211—135 X
3,333,555	8/1967	Kapnek	108—152
3,381,636	5/1968	Saiberlich	108—152

JAMES T. McCALL, *Primary Examiner.*

U.S. Cl. X.R.

108—153; 211—90; 312—265