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Ravreby

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[54] **MODULAR SHOE RACK**

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[52] **U.S. Cl.** **108/6,** 108/111, 108/153, 211/36, 211/148, 211/177

[51] **Int. Cl.** **A47f 5/12**

[58] **Field of Search** 211/148, 34, 36, 177; 312/264, 265, 108, 107, 111; 47/21, 31, 26, 30; 217/13; 108/153, 154, 111

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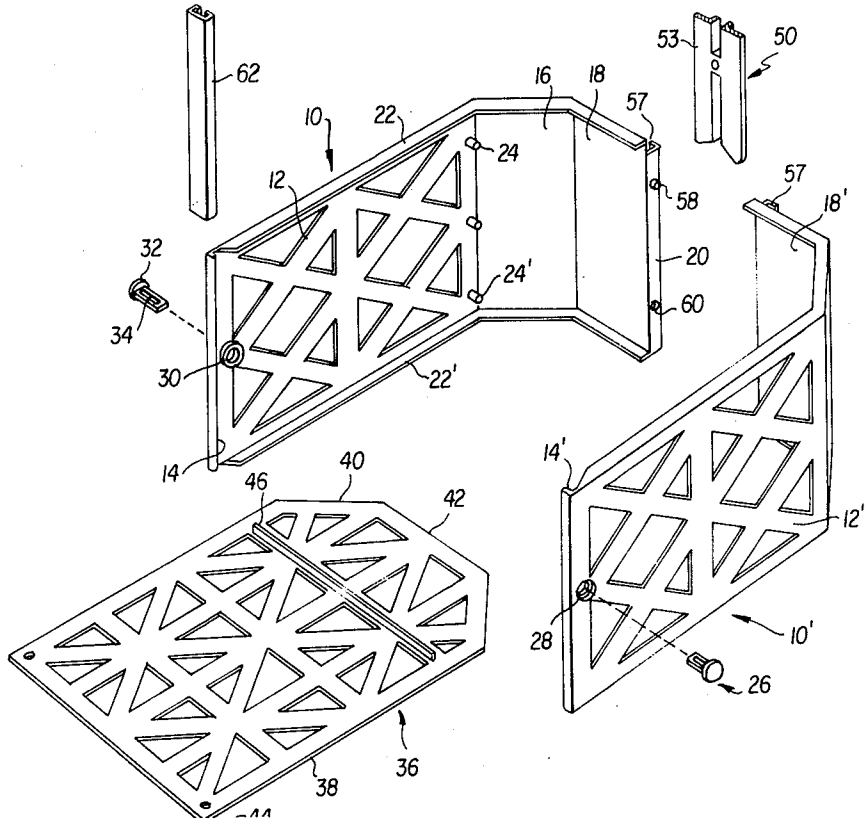
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Assistant Examiner—Richard L. Stroup
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[57] **ABSTRACT**

A modular storage unit capable of being assembled into a wide variety of configurations without the use of tools or adhesives. Each individual module is formed of two identical opposing side panels and a central shelf section. The side panels are joined at the rear and open in front, thereby defining a plurality of cubicles or storage spaces. Each side panel comprises a vertical planar side portion having a ridge extending inwardly along at least a portion of the front thereof; a vertical angled portion extending inwardly from the rear edge of the side portion and joining the side portion with a rear portion; a vertical planar rear portion extending from a rear edge of the angled portion generally perpendicular to the side portion and having a locking ridge extending outwardly along at least a portion of a rear edge thereof; and a pair of vertically spaced horizontal support flanges extending inwardly along at least a portion of the side panel.

33 Claims, 7 Drawing Figures



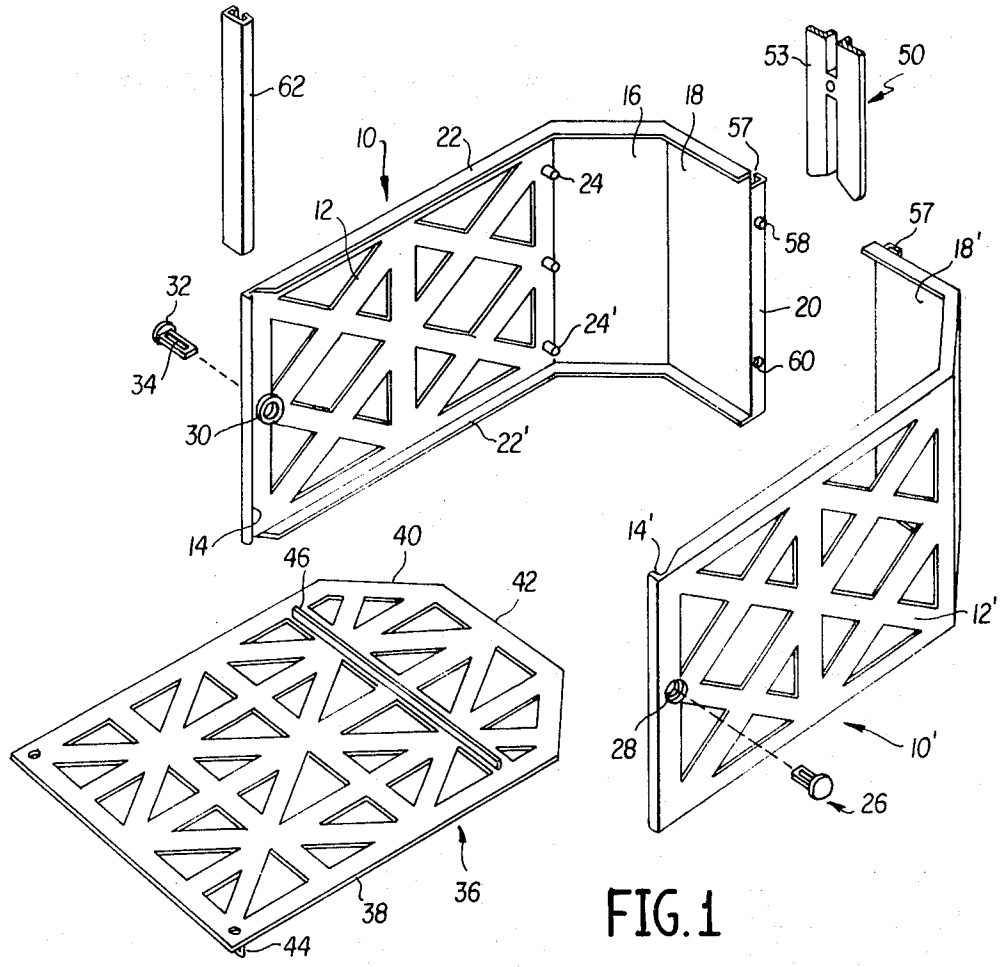

62
53
50
16
18
57
10
22
24
12
58
57
18'
32
20
24'
34
60
30
22'
14
40
46
42
14'
12'
28
10'
26
36
38
44

FIG. 1

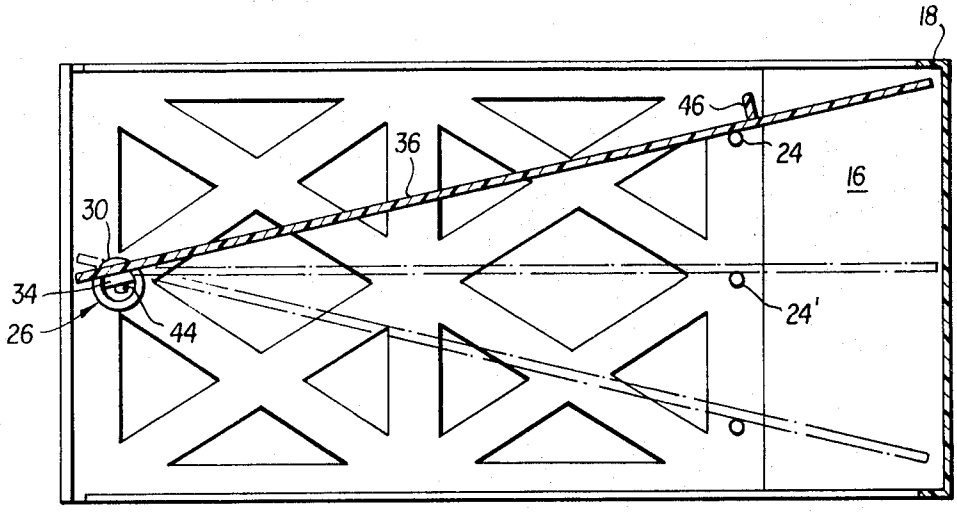
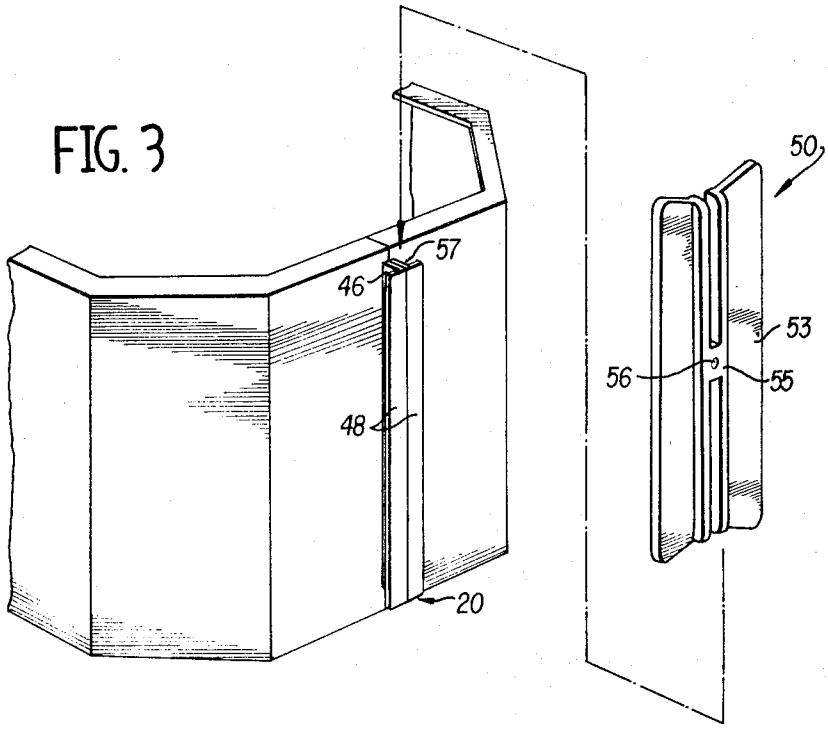

18
46
36
24
16
30
34
24'
26
44

FIG. 2

FIG. 3



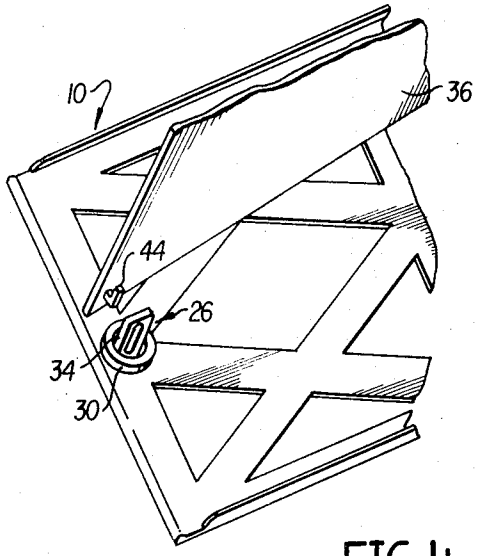


FIG. 4

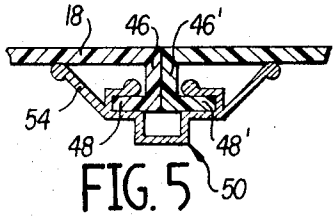


FIG. 5

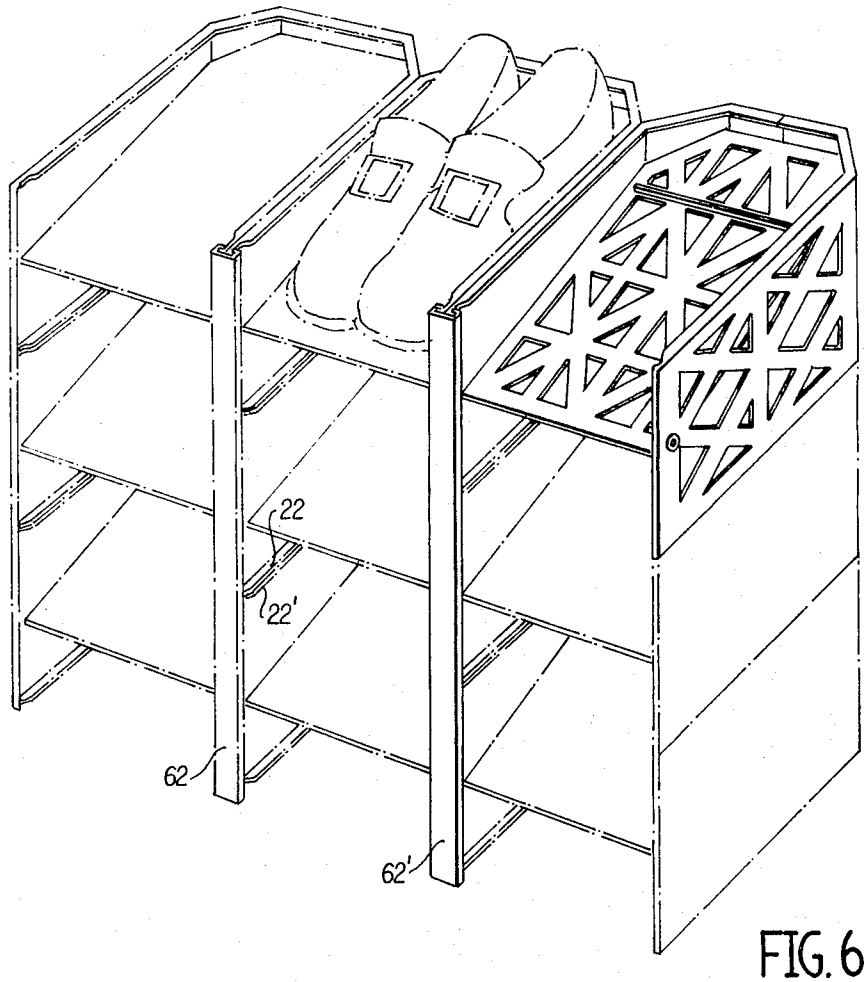


FIG. 6

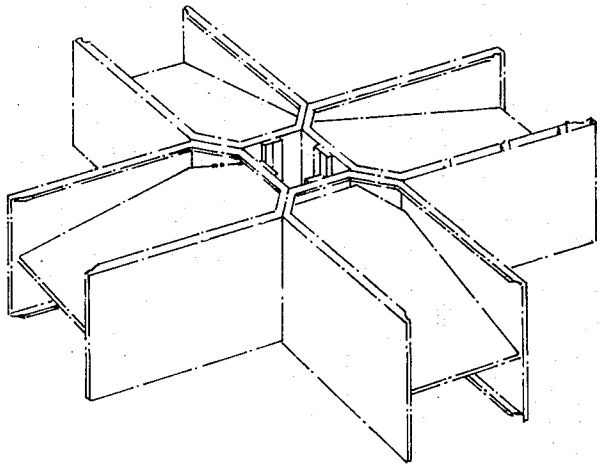


FIG. 7

MODULAR SHOE RACK

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to modular display and storage units. More particularly, this invention relates to modular display and storage units having a plurality of cubicles or storage spaces which are capable of being assembled into a wide variety of configurations.

2. Description of the Prior Art

Display and storage racks are widely used in merchandising since they provide a means for attractively presenting merchandise to potential customers while at the same time permitting separation of different items according to size, color, style, etc. Because of their versatility, modular type display and storage units are often preferred, since conceptually they can be dismembered and reassembled in various configurations to optimally display constantly changing inventory.

Display racks which define a plurality of cubicles or storage spaces are particularly desirable for holding irregularly shaped and sized items such as shoes and boots. In order to focus a potential customer's attention on a limited number of displayed items at one time, it is often desirable to use a display rack which visually segregates a portion of the display items, rather than an open structure such as a wire rack. Furthermore, the use of visually segregated cubicles or storage spaces leads to a neater appearance, since disheveled items are not visible from all points of view.

A number of such modular structures have been proposed in the prior art. However, most of these structures are of fairly complex design and their assembly requires the use of tools and/or adhesives. Since a number of different pieces are used to form such structures, packaging of structures in the dismounted stage is complex and often inefficient. Additionally, inventory stocking of replacement parts is complicated by the fact that several different shaped parts are used.

The assembly of modular structures into a rigid, stable unit is likewise complicated by the generally required use of multiple, different shaped pieces, particularly when a large degree of versatility is desired. For example, cube sections composed of various elements have been used for planar modular arrangements but are generally unsatisfactory for revolving racks, for which wedge-shaped members are used. A store wishing to alternate from stacked planar modules to revolving racks must thus have separate units for each type of display rack, each unit comprising a different set of elements and being assembled in a different way.

Currently available display racks generally do not provide means for conveniently fastening assembled racks to a wall or rigid support. When such a provision is made, the entire assembly, including the support means, must generally be broken down to remove racks from their wall support. Since modern merchandising methods often call for changes in color, etc., it is necessary in order to achieve this to dismember the entire unit, including any wall supports, and completely reassemble a new unit of the desired different characteristics, such as color.

SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide modular display and storage units

capable of simple assembly into a wide variety of configurations.

Another object of the present invention is to provide modular storage units which may be assembled in groups having either a planar or circular arrangement.

A further object of this invention is to provide modular storage units which are lightweight, rigid, and compact.

A more particular object of the present invention is to provide a side panel which may be used in conjunction with another identical panel to form a modular storage unit without regard to which side it is used on.

A still further object of this invention is to provide a readily assembled, rigid, and stable group of modular storage units.

Another object of this invention is to provide a stacked tier of modular storage units having a stable triangular support base.

Briefly, these and other objects, features, and advantages of the present invention are attained in one aspect by providing a modular storage unit capable of being assembled into a wide variety of configurations without the use of tools or adhesives. Each individual module is formed of two identical opposing side panels and a central shelf section. The side panels are joined at the rear and open in front, thereby defining a plurality of cubicles or storage spaces. Each side panel comprises a vertical planar side portion having a ridge extending inwardly along at least a portion of the front thereof; a vertical angled portion extending inwardly from the rear edge of the side portion and joining the side portion with a rear portion; a vertical planar rear portion extending from a rear edge of the angled portion generally perpendicular to the side portion and having a locking ridge extending outwardly along at least a portion of a rear edge thereof; and a pair of vertically spaced horizontal support flanges extending inwardly along at least a portion of the side panel. Preferably, the side panel also includes means for supporting one side of a shelf in at least one position inside the side panel, although the horizontal support flanges can be used for this purpose. However, by using means for providing adjustable shelf support in a plurality of positions, it is possible not only to vary the vertical position of the shelf, but also to vary the horizontal angles thereof. In a preferred embodiment, such means comprises a front pivotal shelf locking member and a plurality of rear shelf support members.

In another preferred embodiment of the invention, the locking flange extending outwardly along the rear edge of the rectangular rear portion of the side panel comprises an integral L-shaped flange which extends rearwardly and then outwardly along the free edge of the rectangular rear portion. The flange may be tapered at the top and bottom edges to facilitate sliding a locking channel member thereover.

The side panels are formed into modular display and storage units by aligning the rear portions thereof and sliding a locking channel member over the locking flange. A shelf corresponding in external dimensions to the internal area encompassed by the adjacent side panels is then inserted therein. A plurality of such modular units may be stacked one on top of the other, and a planar arrangement of adjacent rows may be formed by sliding a spacing member over the flanges along the front edge of adjacent side portions. Because of the presence of an angled portion intermediate the side and

rear portions of the side panels, adjacent rows of stacked display and storage units can be arranged radially about a common open center, thereby leaving a central open space within the rack in which adjacent racks may be affixed to a common revolving support to provide rotation of the entire assembled unit. Thus, the modular display and storage units according to the present invention are suitable for either planar or circular arrangements.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the invention will become still more fully apparent to those skilled in the art from the following detailed illustrative example, taken in conjunction with the annexed drawings, wherein like reference characters refer to like or corresponding parts throughout the several Figures, and in which:

FIG. 1 is an exploded view of a single modular unit according to the present invention;

FIG. 2 is an inner side view, partially in cross-section, showing the inside of a side panel and pivotal shelf in accordance with the present invention;

FIG. 3 is an exploded perspective view of the rear portion of adjoining side panels and a locking channel member used to secure them together;

FIG. 4 is a detailed view of pivotal interengaging means between a front edge of the side panel and a shelf;

FIG. 5 is a detailed cross-sectional view showing an assembled rear locking flange and locking channel member;

FIG. 6 is a schematic perspective view of an assembly wherein tiers of modular units are arranged in planar relationship;

FIG. 7 is a schematic perspective view of a series of tiered modular units assembled in a circular relationship.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The side panel capable of being mated with another side panel to form a modular display and storage unit in accordance with the present invention comprises a vertical rectangular side portion having a flange extending inwardly along at least a portion of a front edge thereof; an integral vertical rectangular angled portion extending inwardly from a rear edge of said side portion and integrally joining the side portion with a rear portion; an integral vertical rectangular rear portion extending from a rear edge of the angled portion generally perpendicular to said side portion and having a locking flange extending outwardly along at least a portion of a rear edge thereof; and a pair of integral horizontal support flanges extending inwardly along the top and bottom respectively of at least a portion of said side panel. Preferably, the side panel includes means for supporting one side of a shelf in at least one position inside the side panel, and more preferably such means provide adjustable support for the shelf in a plurality of positions. In ome embodiment, this is achieved by providing a front pivotal shelf locking member and a plurality of rear shelf support members. Because a portion of the side panel is angled towards the rear, either a planar or circular arrangement of vertical rows may be assembled from the same components.

Referring now the the drawings, FIG. 1 is an exploded perspective view of a modular storage unit assembled in accordance with the present invention. A pair of identical opposing side panels **10, 10'** comprise a vertical rectangular side portion **12, 12'** having a flange **14, 14'** extending inwardly along at least a portion of the front edge thereof. An integral vertical rectangular angled portion **16** extends inwardly from a rear edge of the side portion, and integrally joins the side portion with an integral vertical rectangular rear portion **18, 18'**. Rear portion **18** extends from the rear edge of angled portion **16** in a direction generally perpendicular to side portion **12,** and has a locking flange **20** extending outwardly along at least a portion of the rear edge thereof. A pair of integral horizontal support flanges **22, 22'** extend inwardly along the top and bottom respectively of at least a portion of the side panel. In a preferred embodiment, the side panel includes means for supporting one side of a shelf in at least one position on the inside thereof, such as shelf positioning pins **24, 24'** and pivotal interengaging means **26** insertable through a countersunk circular aperture **28** formed along the front margin of rectangular side portion **12.** Rib reinforcing means **30** can surround countersunk aperture **28** to provide additional strength and stability.

In one embodiment, pivotal interengaging means are formed of a circular head portion **32** having a diameter corresponding to that of countersunk aperture **28** and an integral elongated hollow hook receiving portion **34** for receiving a corresponding hook on the shelf to be inserted therein.

A support shelf **36** is provided with exterior dimensions corresponding to the inner dimensions enclosed by two adjoining side panels. In the embodiment shown in FIG. **1,** a longitudinal side **38** corresponds in length to that of rectangular side portion **12** of the side panel; an angled rearwardly extending portion **40** corresponds in length to rectangular angle portion **16** of the side panel; and rear portion **42** corresponds to twice the length of rectangular rear portion **18** of the side panel. For use in displaying materials such as shoes or the like at an angle, it is desirable to include a support rib **46** extending across at least a portion of the width of the shelf member.

Referring briefly to FIG. **2,** pivotal rotation of shelf **36** about pivotal interengaging means **26** is shown in a schematic cross sectional view. As shown in detail by FIG. **4,** shelf hook member **44** is fitted into hook receiving means **34** on integral pivotal engaging means **26;** by varying the position of the rear portion of the shelf onto different support means **24, 24'** the angle of the shelf may be changed without dismounting the assembled structure.

FIG. **3** illustrates a preferred embodiment of rear locking flange **20,** wherein a flange having an L-shaped cross-sectional configuration is used. In the illustrated embodiment, a detailed cross-sectional view of which is shown in assembled form in FIG. **5,** locking flange **20** comprises a portion **46** which extends in a direction parallel to the side portion, and a portion **48** which is angled outwardly from along the free edge of rectangular rear portion **18.** Preferably, the locking flange is tapered at each end to facilitate sliding a locking channel member **50** thereover. With two corresponding side panels held together, inward flexing at the juncture of corresponding flanges is resisted. This is achieved be-

cause a pair of adjoining rearwardly extending flange portions are aligned side by side and held together along portions **46, 46'** in a T-shaped cross-sectional configuration. The top of the T is formed by outwardly extending portions **48,** and is snugly enclosed by a corresponding portion of channel member **50.** Thus, inward flexing is resisted by adjoining flat surfaces and additionally by the snug enclosure provided by channel member **50.** At the same time, outward flexing is resisted by outwardly angled members **54** of locking channel member **50,** which extends in an assembled configuration into contact with the outer wall of the rectangular rear portion **18** of the side panel. Channel member **50** can be provided with apertures **56** along the rear edge thereof through which a screw or other affixing member can be passed for rigidly securing the entire channel member to a wall or other suitable support.

In stacking a plurality of modular units together, horizontal support flanges **22, 22'** which extend inwardly from the longitudinal edges of each side panel minimize the criticality of precise vertical alignment of one modular unit atop another by providing an increased contact area over which weight bearing forces can be distributed. Alignment pins **58** and corresponding alignment apertures **60** provide horizontal alignment of two matching side panels which are locked into position when the rear channel member **50** is fitted over a pair of facing locking flanges **20, 20'.** As with the pivotal interengaging means, the number and location of pins **58** and apertures **60** can be varied, preferably symmetrically about the vertical center of side panel **10** so that the side panel units are interchangeable for either the left or right side.

Referring to FIGS. **1** and **4,** it will be seen that pivotal interengaging means **26,** hen interengaged with shelf hook **44,** holds the front of a modular unit together and keeps it from spreading out. Where a slight spread is desired, as for example in circular assemblies, a slightly wedge - shaped support shelf **36** can be provided to space the front of the modular unit, and additional locking interengaging means of adjoining units is unnecessary.

A simple partially closed U-shaped channel member **62,** shown in FIGS. **1** and **6,** can be used to provide a base support in conjunction with rear channel member **50** in a single tier of modular units, or to join adjacent rows, as shown in FIG. **6.** In the event that only a single row is used, a stable tripod supporting base is formed when rear channel member **50** and a pair of front side channel members **62, 62'** extend to the floor below the lowest modular unit, thereby providing a stable, non-wobbling base. Since the modular units are vertically adjustable along each channel member, they can be made plumb even when the three channel members are resting on an uneven surface.

It will be appreciated that a variety of configurations are achievable in accordance with the present invention. Thus, for example, by varying the number and angles of rectangular angled portions 16, it is possible to achieve radial distortion of any number of tiered assemblies. While each assembled unit will preferably form a generally U-shaped side wall structure, other configurations are also possible.

Referring again to FIG. **6,** it can be seen that a planar relationship of stacked tiers of the modular assembly is readily obtained. By varying the width of front channel member **62,** the units can be spaced apart to provide areas for labeling price, size, and the like.

Referring now to FIG. **7,** it can be seen that the modules formed in accordance with the present invention can be arranged in a circular relationship as well as the planar relationship shown in FIG. **6.** Each individual unit is arranged radially about a common center, but it does not extend to the center; therefore, an open central space within the rack is provided in which a central revolving or other support means is affixed to the stacked units. By varying the configuration of rectangular angled portions **16,** e.g., by providing a faceted rather than single angled portion, different numbers of tiers can be arranged around a common revolving rack.

FIG. **1** shows another preferred embodiment of rear locking channel member **50** wherein a butterfly configuration is employed. In this embodiment, outwardly angled members **53** fit snugly into the recess formed in rear locking flange **20** by portions **18, 46,** and **48** thereof. An integral central cross-piece **55,** preferably provided with an aperture **56** to receive a screw or other affixing member, fits between two stacked modular units. The modular units can be notched at **57** a depth equal to half the length of crosspiece **55.** The butterfly rear locking channel member thus locks the bottom half of an upper module to the top half of a lower module.

From the foregoing description, one skilled in the art can easily ascertain the essential characteristics of this invention, and without departing from the spirit and scope thereof, can make various changes and modifications of the invention to adapt it to various usages and conditions.

I claim:

1. A side panel capable of being detachably mated with another similar side panel along vertical portions thereof to form a modular display and storage unit, comprising:

a. a vertical planar side portion having a ridge extending longitudinally and inwardly along a major portion of the outer edge of a front margin thereof;

b. a vertical angled portion comprising a front segment extending inwardly from the ear of said side portion and a rear segment joining the back of said side portion with a vertical rear portion;

c. said vertical rear portion extending from said rear segment of said angled portion away from said side portion and having rearwardly extending locking means along at least a portion of a rear margin thereof;

d. horizontally spaced means on the inside of said side panel for supporting one side of a shelf, said horizontal support means capable of providing angularly adjustable support for said shelf in a plurality of positions; and

e. integral horizontal support flanges extending inwardly along the top and bottom of at least a portion of said side panel.

2. An article according to claim **1,** wherein said side portion is rectangular.

3. An article according to claim **1,** wherein said angled portion includes at least one planar segment.

4. An article according to claim **3,** wherein said angled portion is planar.

5. An article according to claim **3,** wherein said planar segment is rectangular.

6. An article according to claim 1, wherein said rear portion is planar.

7. An article according to claim 6, wherein said rear portion is generally perpendicular to said side portion.

8. An article according to claim 6, wherein said rear portion is rectangular.

9. An article according to claim 1, wherein said side portion and said rear portion are rectangular.

10. An article according to claim 1, wherein said side portion, said angled portion, and said rear portion are integrally formed.

11. An article according to claim 1, wherein said horizontal support means comprise vertically spaced projections.

12. An article according to claim 11, wherein said projections extend longitudinally along the top and bottom respectively of said side panel.

13. An article according to claim 11, wherein said horizontal support means are support pegs.

14. An article according to claim 1, wherein said horizontal support means comprises a front pivotal shelf locking member and a plurality of vertically spaced rear shelf support members.

15. An article according to claim 1, wherein said locking means has a first portion thereof extending outwardly along a rear edge of said rear portion, and a second portion angled therefrom in a direction generally perpendicular to said side portion.

16. An article according to claim 1, further including a countersunk aperture formed through the front margin of said side portion spaced inwardly from said ridge, and rib reinforcement means surrounding said aperture on the inside of said side panel.

17. An article according to claim 16, further including pivotal interengaging means insertable into said aperture.

18. An article according to claim 6, wherein said horizontal support means comprises a plurality of vertically spaced support pins extending inwardly along said side portion.

19. A modular storage and display unit comprising a pair of side panel members according to claim 1 mated with each other along the rear portions thereof.

20. An article according to claim 19, further including a locking channel member securely engaging a corresponding pair of said locking means.

21. A plurality of articles according to claim 20, stacked one on top of the other, and having a common locking channel member.

22. A plurality of articles according to claim 21, arranged in a plurality of adjacent rows, and further including channel members encompassing adjacent side portion ridges.

23. A plurality of articles according to claim 19, arranged in a group of tiers of stacked members, each tier facing inwardly and the rear portions of each unit forming a central hollow core, the tiers being in a generally circular relationship with respect to each other.

24. An article according to claim 21, wherein said locking channel member is an integral butterfly shaped member comprising a pair of outwardly angled longitudinally extending members adapted to fit snugly into a corresponding pair of recesses formed between the rear locking flange and rectangular rear portion of said side panel, said longitudinally extending members being of a length approximately equal to the length of said side panel and being joined to each other at the mid point along their length by an integral central crosspiece, said side panels being notched to receive said crosspiece at both the top and bottom thereof a depth equal to half the length of said crosspiece.

25. An article of manufacture capable of being assembled into a modular display and storage unit, comprising a pair of similar side panels matable with each other along rear portions thereof and a support shelf having exterior dimensions corresponding to the inner dimensions enclosed by a mated pair of side panels, said side panels each being characterized by:

a. a vertical planar side portion having ridge means extending longitudinally and inwardly along a major portion of the outer edge of a front margin thereof;

b. a vertical angled portion comprising a front segment extending inwardly from the rear of said side portion and a rear segment joining the back of said side portion with a vertical rear portion;

c. said vertical rear portion extending from said rear segment of said angled portion away from said side portion and having rearwardly extending locking means along at least a portion of a rear margin thereof;

d. means for supporting one side of said support shelf in at least one position on the inside of each said side panel; and

e. integral horizontal support flanges extending inwardly along the top and bottom of at least a portion of said side panel.

26. An article according to claim 25, wherein said means (d) comprise vertically spaced projections.

27. An article according to claim 26, wherein said projections extend longitudinally along the top and bottom respectively of said side panel.

28. An article according to claim 26, wherein said projections are support pegs.

29. An article according to claim 25, wherein said means (d) comprise a front pivotal shelf locking member and a plurality of vertically spaced rear shelf support members.

30. An article according to claim 25, wherein said locking means has a first portion therof extending outwardly along a rear edge of said rear portion, and a second portion angled therefrom in a direction generally perpendicular to said side portion.

31. An article according to claim 25, further including a countersunk aperture formed through the front margin of said side portion spaced inwardly from said ridge, and rib reinforcement means surrounding said aperture on the inside of said side panel.

32. An article according to claim 31, further including pivotal interengaging means insertable into said aperture.

33. An article according to claim 32, wherein said means (d) comprises a plurality of vertically spaced support pins extending inwardly along said side portion.

* * * * *