United States Patent [19]

Muller

[11] **3,851,936**

[45] **Dec. 3, 1974**

[54] **ATTACHMENT DEVICE FOR MODULAR UNITS**

[75] Inventor: **Richard Muller,** Highland Park, Ill.

[73] Assignee: **Donat Talbot Archambult,** Pools Park, Ill.

[22] Filed: **Aug. 16, 1973**

[21] Appl. No.: **388,986**

[52] **U.S. Cl.** **312/108,** 312/111, 312/245, 312/349, 206/DIG. 29, 220/23.4

[51] **Int. Cl.** **A47b 87/00,** A47b 87/02

[58] **Field of Search** 312/107, 108, 111, 245, 312/263, 234.5, 349; 46/25, 30, 31; 220/102, 23.4; 206/DIG. 29

[56] **References Cited**

UNITED STATES PATENTS

3,131,829	5/1964	Mosser	220/102
3,552,817	1/1971	Marcolongo	312/107
3,743,372	7/1973	Ruggerone	312/108

Primary Examiner—Casmir A. Nunberg

Attorney, Agent, or Firm—Hill, Gross, simpson, Van santen, Steadman, Chiara & Simpson

[57] **ABSTRACT**

An attachment device for modular units, such as rectangular cabinets, which are to be attached to each other along their side surfaces. The side surfaces are formed with wedge shaped raised portions defining the sides of wedge shaped recesses. The raised portions of one unit index with the recesses in another unit and the side walls of the indexing raised portions and recesses are angled in two planes to provide a lock.

2 Claims, 7 Drawing Figures

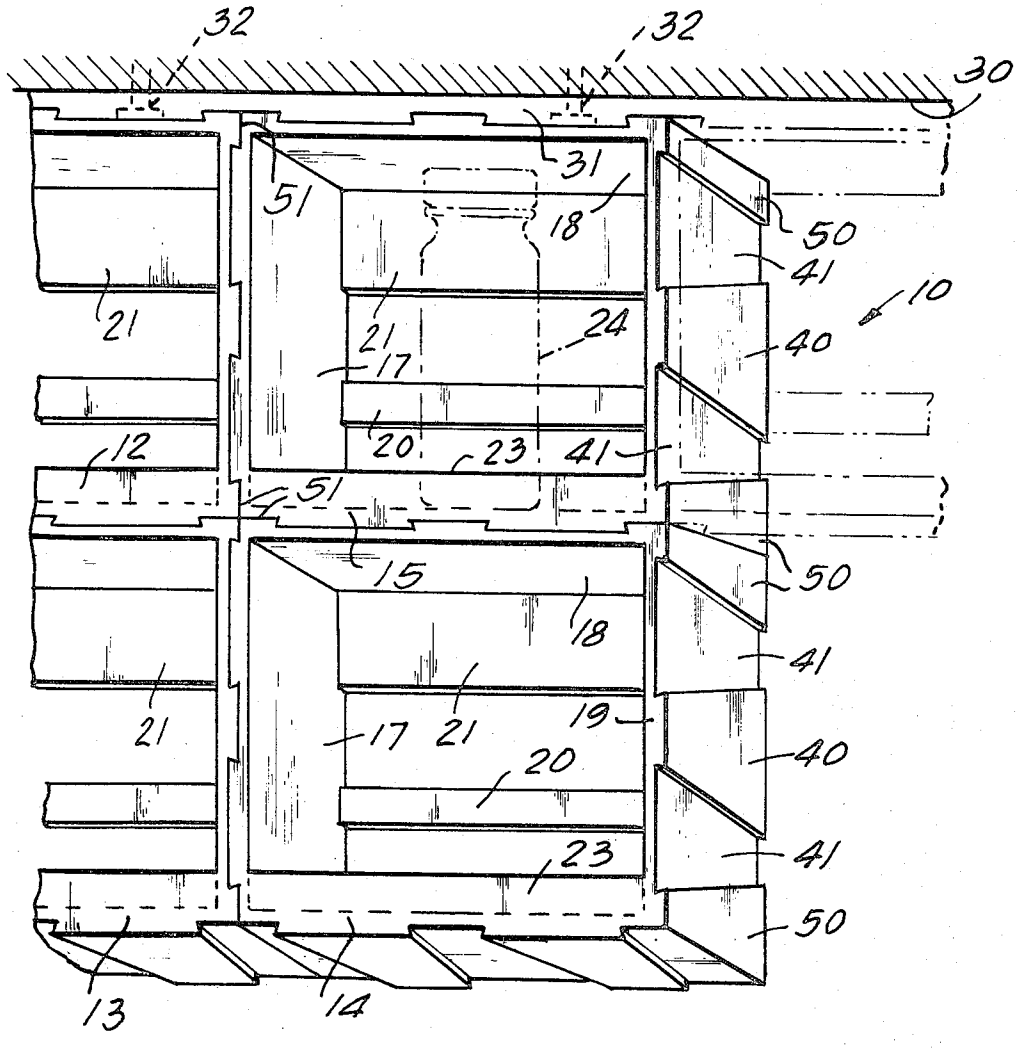


Fig. 1

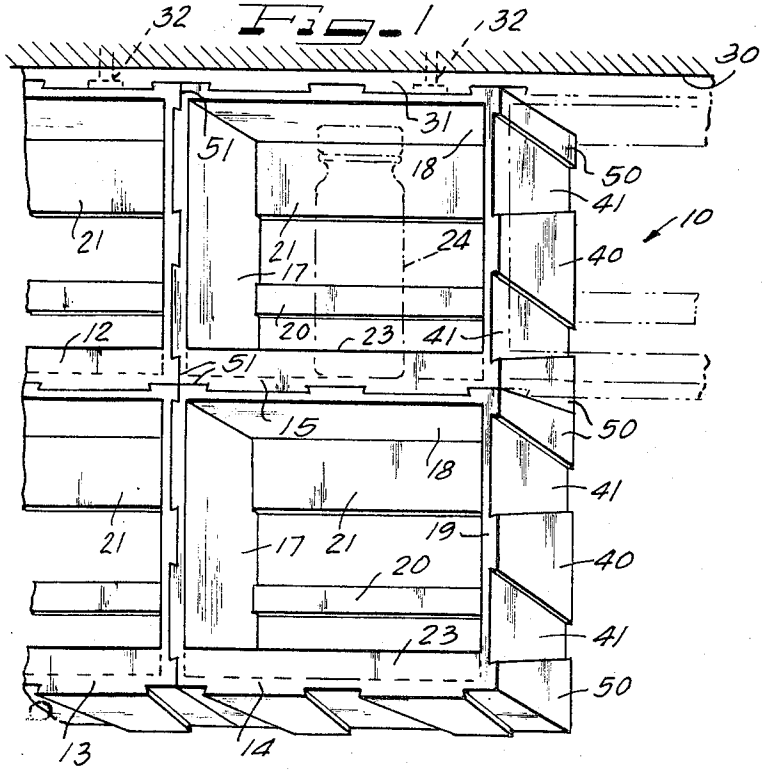


Fig. 2

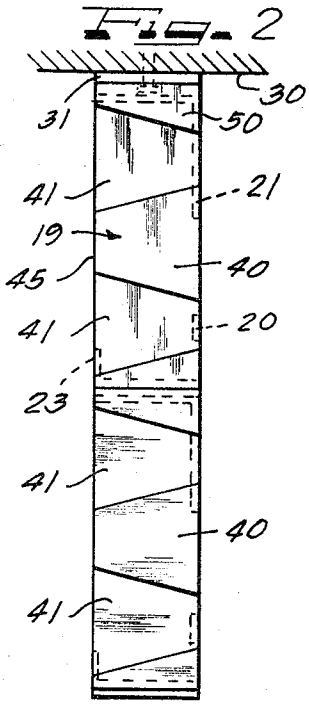


Fig. 3

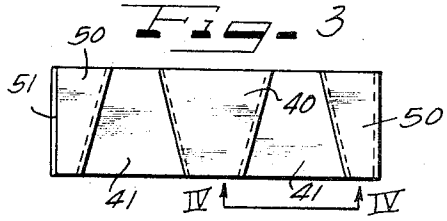
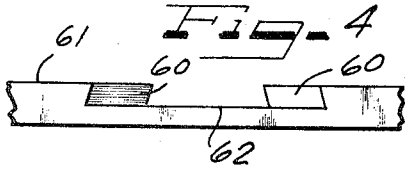


Fig. 4



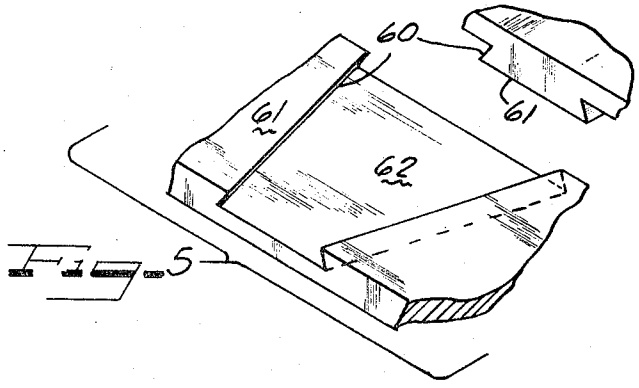


Fig. 5

Fig. 6

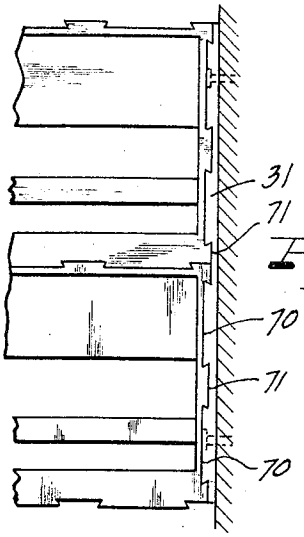
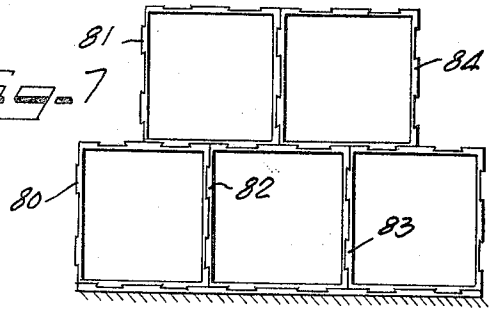


Fig. 7



ATTACHMENT DEVICE FOR MODULAR UNITS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to attachment devices, and more particularly, to an interlocking surface attachment for modular assemblies.

2. The Prior Art

Modular cabinet assemblies are known to the art, and include devices which consist of a plurality of individual rectangular cabinet members which are interlockable with other cabinet members. Numerous interlock constructions have been suggested, such as indexed projections and openings, as shown in U.S. Pat. No. 1,390,374 to Niles, issued Sept. 13, 1921; dovetailed projections and separate locking members, as shown in U.S. Pat. No. 2,752,215 to Peiss, issued June 26, 1956; and an indexing surface of tongues and grooves, such as that illustrated in the U.S. Pat. No. 3,552,817 to Marcolongo, issued Jan. 15, 1971.

These devices, in general, have required external and separate locking members, or they have locked only in one direction. In order to compensate for the fact that the prior art constructions which have utilized indexing side wall configurations have locked only in one direction, it has been known to provide pin and slot means, or the like, to lock in a second direction. Those devices which relied upon the use of external locking strips or the like have required additional parts to create the assembly. This results in a reduced ability to assemble numerous modules together in differing configurations. Those devices which have relied upon locking pins or projections or the like, are difficult to disassemble and reassemble.

It would therefore be an advance in the art if a modular assembly system could be devised which locks in more than one plane, yet which is simple to assemble.

SUMMARY

My invention provides a modular unit which consists of a plurality of rectangular or the like shaped individual units, such as four, five, or six sided cabinet frames, where the side walls of the units are configured to provide interlocking surfaces. The side walls are formed as a series of alternating raised portions and recessed portions. The raised and recessed portions are wedge shaped from a front to a back of the modular units, and the raised portions are sized to index with the recessed portions of an adjacent unit. The wedge shape of the raised and recessed portions provides a locking feature, so that while the raised portions of one unit may be slid into the recessed portions of another unit, the wedge action will prevent further movement in one direction when the raised portion is tightly seated in the corresponding recessed portion.

In order to prevent lateral withdrawal, the side walls of the raised portions which define the sides of the recessed portions are angled. Thus, when a raised portion is received in a corresponding recessed portion, it will be wedged against movement in one direction by the wedge shape of the raised portion and the recessed portion, and will be locked against movement in another direction by the dovetail interlock of the side walls of the raised portions.

The dovetail interlock prevents separation of adjacent attached together modular units by preventing movement of the side walls of the modular units away from one another, while the wedge shape of the recesses and the raised portions from front to back will prevent separation of the modules by movement of the side walls in parallel planes with respect to one another in one direction. Further, a wedge shape provides that when the modules are assembled together, the front faces of adjacent modules and of all of the assembled together modules will lie in the same plane.

It is therefore an object of this invention to provide an attachment device for modular constructions.

It is another and more important object of this invention to provide a side wall indexing attachment device for modular units wherein the side walls to be attached together have alternating wedge shaped recessed and raised portions dimensioned to index with one another, the side walls of the wedge shaped raised portions being angled to form dovetail locks.

It is another object of this invention to provide a modular assembly having locking means on the side walls of individual components of the assembly indexing with locking means on side walls of other components, the locking means locking in two planes.

It is yet another object of this invention to provide a modular assembly system for assembling rectangular units together with interlocking side walls, the system including a mounting strip indexable with the side walls of a plurality of assembled together rectangular units to mount the entire assembly to a common structure.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the invention will be readily apparent from the following description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

FIG. **1** is a perspective view of a plurality of modular units equipped with the locking device of this invention mounted on a common surface.

FIG. **2** is a side view of the assembly of FIG. **1.**

FIG. **3** is a top plan view of one of the side walls of one of the modular units of FIGS. **1** and **2** equipped with the locking means of this invention.

FIG. **4** is a fragmentary plan view taken along the lines IV—IV of FIG. **3.**

FIG. **5** is a fragmentary perspective view illustrating the interlocking device of this invention.

FIG. **6** is a view similar to FIG. **1,** with the units mounted to a common surface along a vertical plane.

FIG. **7** is a front plan view of a plurality of modular units assembled together.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. **1** illustrates a spice rack assembly **10** or the like consisting of a plurality of individual rack modules **12, 13, 14,** and **15,** each of which is a rectangular cabinet having side walls **17, 18, 19,** and **20,** with the walls **18** and **20** forming top and bottom walls, and the walls **17** and **19** forming side walls. The individual modules also have partial back panels **21** and **22** and partial front panels **23.** The individual modules are sized to receive interiorly thereof a plurality of spice bottles **24** or the like.

It will be appreciated that although the preferred embodiment illustrated is a spice rack composed of a series of rectangular modules interconnected with one another, the invention can be practiced with other constructions, such as book shelving, cabinets, storage containers, or the like. Further, although the spice racks are illustrated as having partial back walls or panels and partial front panels, this is only illustrative of a preferred embodiment which has been specifically designed to hold spice bottles.

The rack is attached to an undersurface of a member, such as a counter or a shelf **30,** by indexing with a mounting strip **31** which may be affixed to the undersurface **30** by means of screws **32** or the like.

Each of the outside surfaces of the side walls **17, 18, 19,** and **20** are formed with a series of alternating raised portions **40** and recessed portions **41.** The raised portions or ribs define the recessed portions or flutes, and the two portions are accounted for by differences in thickness of the material of the side walls. Each of the portions **40, 41** is formed as a wedge shape, with the raised portions, in the illustrated embodiment, increasing in width from the front **45** to the back **46** of the module. The recessed portions corresponding decrease in width from the front to the back of the module. The shapes of the recesses and the wedges are the inverse of one another, whereby each raised wedge is codimensional with each recess wedge.

As illustrated, at the corners of the module half raised portions **50** are provided, while at the corners on the opposite side half recessed portions **51** are provided.

In the preferred embodiment illustrated, the recessed portions on one side wall are aligned with raised portions on the opposite side wall. In this manner, any two module units can be attached together along any of their side walls.

The wedge shape from the front face to the back face provides a positive blocking feature in that when the raised portion of one side wall is indexed with the wedged recess of the other side wall, the movement of one side wall with respect to the other side wall is limited. That is, when a raised portion is fully received in a recessed portion, the raised portion will no longer be movable towards the small end of the recessed portion. By making the small end of the recessed portion adjacent the back **46** of the module, it will be assured that the back faces, and therefore also the front faces, of equal width modules will be aligned in a plane. Although it is still possible, in such a circumstance, for the raised portion to be moved towards the wider end of the wedge shaped recess, this possibility can be reduced by maintaining close tolerance of the sizing of the wedge shaped recesses and raised portions, so that when fully seated, a press-fit relationship will exist which will restrict movement.

Further, where the modules, such as the illustrated spice racks, are to be affixed against a wall, reversing the shape of the wedges from those illustrated and placing the assembled modules against the wall will assure that they will never separate, because the wedge shape will prevent movement in the direction away from the wall, whereas the wall will prevent movement in the opposite direction.

In order to prevent the modules from separating in a direction normal to the plane of the side walls, the sides of the raised portion, as illustrated at **16,** FIG. **4,** are angled with respect to the surfaces **61** of the raised portion and the base surface **62** of the recessed portion. Thus, the side walls of the raised portions and of the recessed portions, when indexed together, dovetail with one another, as illustrated in FIG. **5.** This dovetail interfit will lock the modular units together against movement in a plane normal to the plane of the side walls of the module.

FIGS. **1** and **6** illustrate a mounting strip **31** which has a series of raised portions **70** and recessed portions **71** corresponding to the raised and recessed portions of the modules, whereby assembled together modules may be mounted to the mounting strip **31.** The mounting strip **31** can then be mounted to a wall surface or the like.

FIG. **7** illustrates that the individual modules **80, 81, 82, 83,** and **84** may be attached to each other in staggered relation rather than in the side-by-side relation of FIGS. **1, 2,** and **6.**

By making all raised portions and recessed portions of equal size around the outside of the rectangular module, each module side wall will index fully with another module side wall or partially with two modules' side walls lying in the same plane.

It will therefore be seen from the above that my invention provides an attachment device for modular units wherein the side walls of rectangular modular units are provided with a series of alternating raised and reduced portions of wedge shape having dovetailed or angled side walls. This combination of alternating wedge shaped ribs and flutes provides an interlock in a plane parallel to the plane of the side walls. In addition, by dovetailing the side walls of the ribs and channels, locking is provided in a plane normal to the plane of the side walls. Thus, my invention provides a more secure attachment than heretofore indexing dovetail slots and ribs, while providing a greater degree of ease of assembly and disassembly than prior devices which required external attaching strips or the like.

Although the teachings of my invention have herein been discussed with reference to specific theories and embodiments, it is to be understood that these are by way of illustration only and that others may wish to utilize my invention in different designs or applications.

I claim as my invention:

1. A modular unit assembly comprising a plurality of interfitting four-sided units with each side of each unit having alternating flutes and ribs extending continuously along the depth from a front to a back of the units, each rib having undercut side edges along the depth thereof, each rib increasing in width along the depth thereof at a wedge angle, and each flute decreasing in width along the depth thereof in complimentary relationship with the ribs, heights of the ribs and depths of the flutes being equal and the undercut edges of the ribs providing a dovetail interlock holding the ribs against the bottoms of the flutes and forming a continuous contact between outside surfaces of interfitting units and the mating wedge angles of the ribs and flutes locking the interfitting units in axially aligned relation.

2. The assembly of claim **1** including a mounting strip having a length greater than the side of a unit, the strip having one surface formed with alternating ribs and flutes indexable with ribs and flutes of co-planar surfaces of a plurality of attached together units to provide a common mounting strip for the attached together units, a second surface, opposite the one surface of the strip being planar.

* * * * *