United States Patent [19]

Grachten

[11] **3,898,939**

[45] **Aug. 12, 1975**

[54] **SHELF ASSEMBLY**

[75] Inventor: **Erich Grachten,** Detmold, Germany

[73] Assignee: **Burris Industries, Inc.,** Lincolnton, N.C.

[22] Filed: **Mar. 13, 1973**

[21] Appl. No.: **340,855**

[30] **Foreign Application Priority Data**

Nov. 21, 1972 Germany ..... 7242791[U]

[52] **U.S. Cl.** **108/109;** 108/111; 108/153; 211/148; 248/245; 403/388;384

[51] **Int. Cl.** **A47b 3/06**

[58] **Field of Search** 108/96, 101, 107, 109, 108/110, 111, 106, 64, 155, 153, 152; 248/230, 245, 244, 221; 312/351; 211/148; 297/440

[56] **References Cited**

UNITED STATES PATENTS

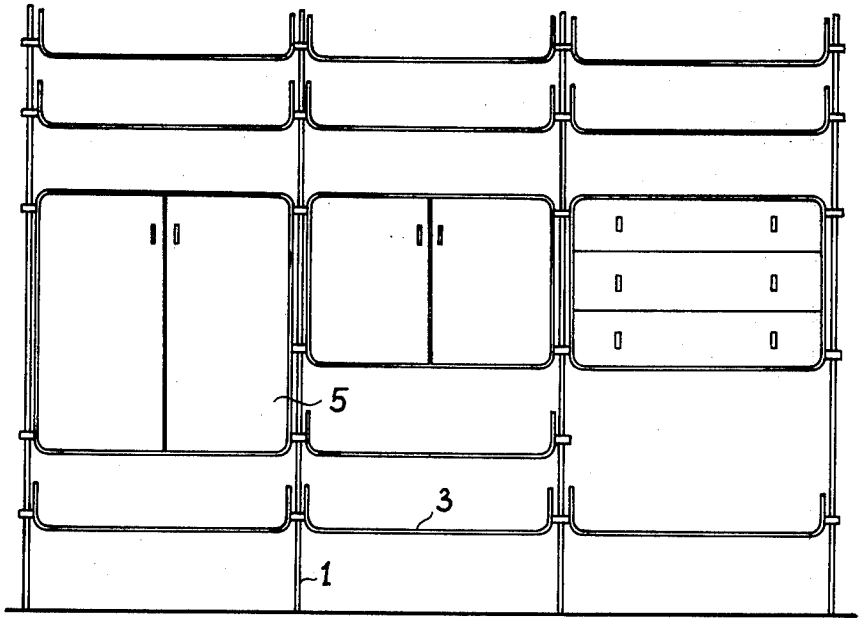
911,567	2/1909	Berkowitz	108/106
1,088,324	2/1914	Corkhill	248/245
2,150,795	3/1939	Beckwith	108/106
2,621,007	12/1952	Barbin	108/153
3,132,609	5/1964	Chesley	108/106
3,170,418	2/1965	Gruenstein	108/101
3,580,535	5/1971	Naske	108/107
3,640,498	2/1972	Aleks	108/96
3,645,036	2/1972	Biesterfeld et al.	297/440

Primary Examiner—James T. McCall
Assistant Examiner—Darrell Marquette
Attorney, Agent, or Firm—Parrott, Bell, Seltzer, Park & Gibson

[57] **ABSTRACT**

A shelf assembly comprises a plurality of spaced, vertically extending tubular poles which support one or more shelving components (e.g. shelf elements, cabinets, etc.) therebetween. The components are supported in place by means of retainer rings which encircle the poles, which are freely slidable to any desired vertical position thereon, and which are adapted to be clamped at a desired position, the rings each being provided with an annular recess; and hook-like brackets are affixed to spaced portions of each shelving component for insertion into the recesses of the retainer rings.

7 Claims, 6 Drawing Figures



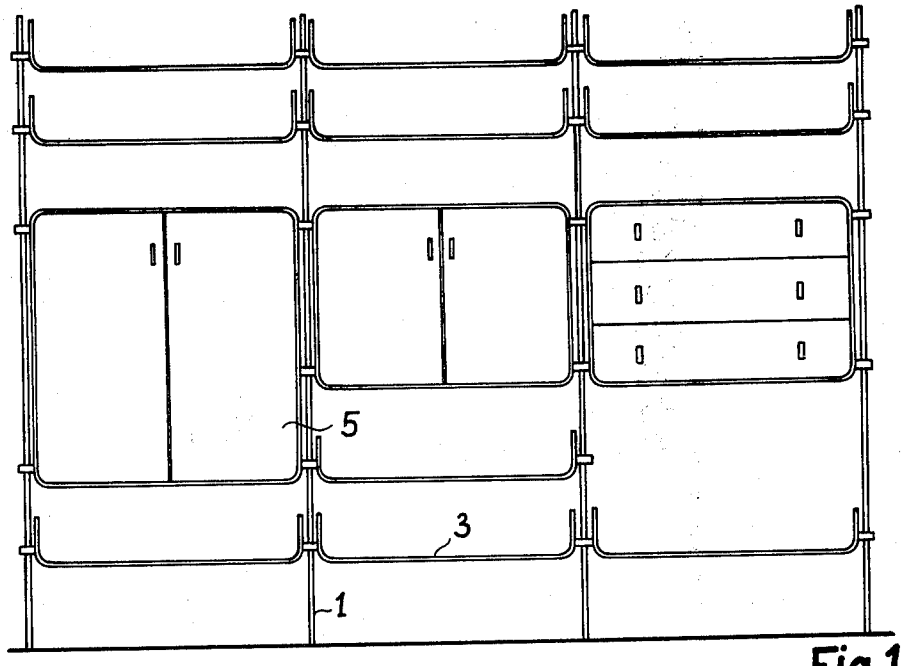


Fig.1

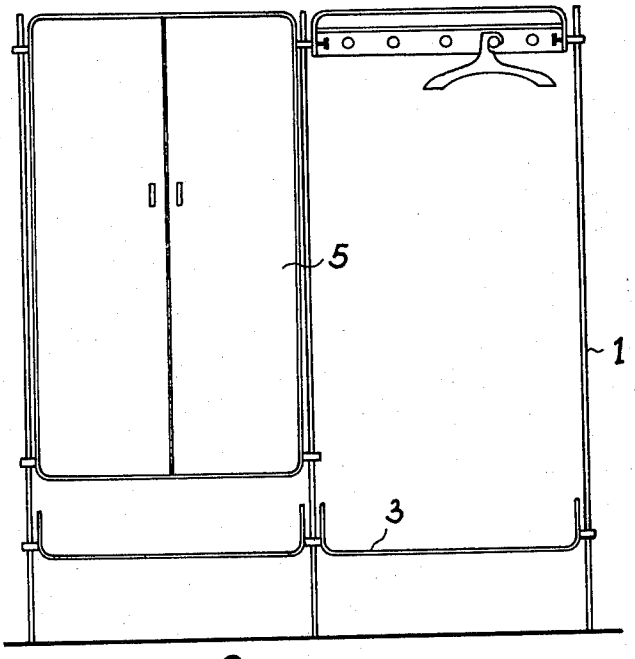


Fig.2

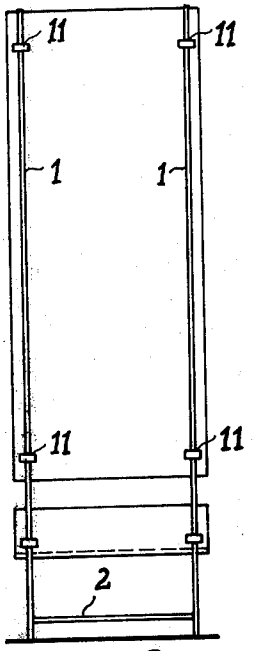


Fig.3

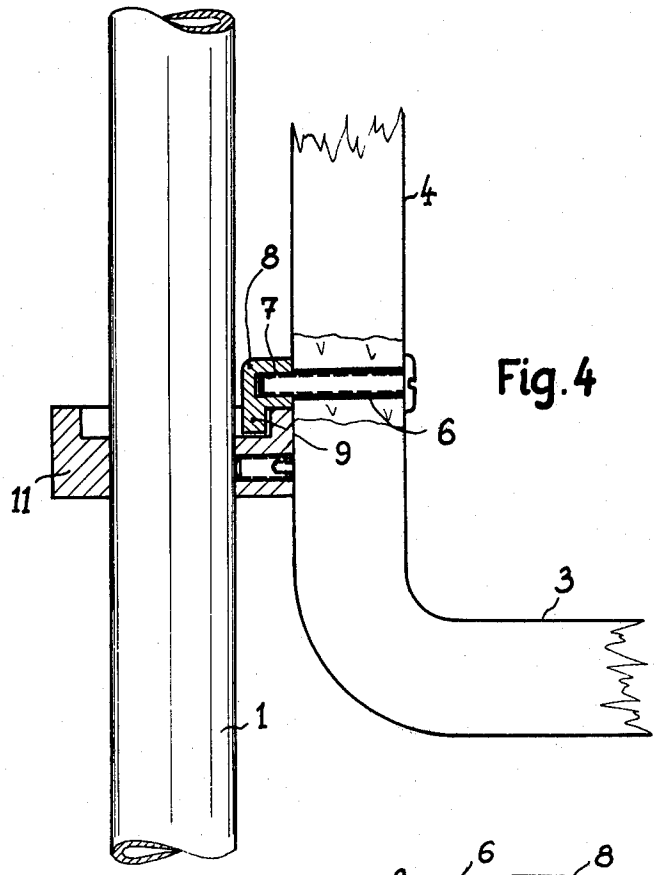


Fig. 4

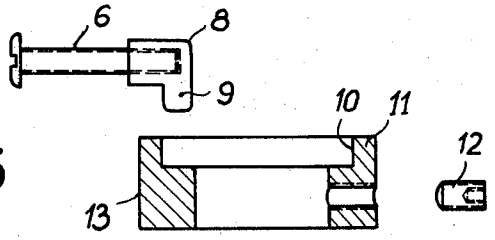


Fig. 5

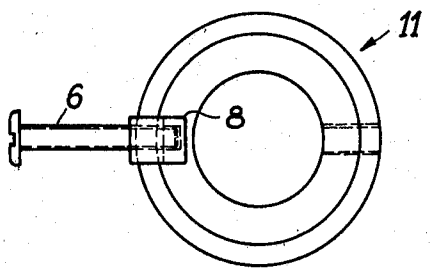


Fig. 6

SHELF ASSEMBLY

BACKGROUND OF THE INVENTION

The present invention relates to an improved shelf assembly comprising a number of units which can be interconnected to one another to provide a shelving assembly, and which is characterized by the provision of vertical supports to which shelves, cabinets, and similar elements can be secured at desired positions to form a modular arrangement of any of many possible configurations.

Shelf assemblies of the general type contemplated by the present invention are already known. The types of assemblies which have been suggested heretofore, however, are ordinarily provided with vertical supports comprising side walls provided with holes located at a number of fixed positions, into which pins, lugs or the like, can be inserted to support shelf boards. These known constructions accordingly allow the shelf elements to be mounted only at certain specified positions, and permit the height of those elements to be adjusted only to those positions which correspond to the positions of the holes in the side walls of the assembly. Furthermore, the constructions suggested heretofore can be used only for shelf arrangements which have continuous (i.e. one-piece) side walls.

The present invention is intended to obviate these disadvantages of the prior art, and to provide a novel arrangement which eliminates the need for a continuous side wall, and wherein shelving components such as shelf elements, cabinets, etc. can be positioned vertically at any desired height without limitation imposed by reason of the construction of the support members employed.

SUMMARY OF THE INVENTION

The shelf assembly of the present invention comprises a number of vertical supports which preferably constitute pairs of vertically mounted steel tubes spaced from one another and adapted to support various different shelving elements therebetween at any desired vertical positions relative to the tubes, and at any desired positional array relative to one another. These objects are achieved by a novel, continuously adjustable, support arrangement comprising support rings which glide upon the support tubes and which are adapted to be clamped or secured to the tubes at any desired height, said rings being provided with recesses shaped and positioned to receive complementarily shaped fixtures connected to shelves, cupboards, or other elements to be supported on said tubes.

The shelving components may take any of a variety of different configurations, so long as they are appropriately sized and shaped to fit between the aforementioned support tubes, and to receive brackets or fixtures which cooperate with the recessed retainer rings on said support tubes. In one embodiment of the invention, the shelves can be provided with vertical side walls at their opposing ends to act as "book ends" and to facilitate the mounting of fixtures or brackets on the shelves for cooperation with the retainer rings.

The metal support tubes are preferably of circular cross section, and cooperate with support rings of cylindrical cross section adapted to slide upon or glide along the exterior of the tubes. The support rings can be provided with a pair of aligned bores, one of which has a diameter closely conforming to that of the metal tubes, and the other of which is of larger diameter to provide a groove in the upper surface of the ring, surrounding the tube, into which a fixture or bracket can be inserted. The support rings are also provided with locking means for clamping each ring to a tube at a desired vertical position, and in the preferred embodiment of the invention the locking means can take the form of a grub screw or set screw of known type extending through a side wall of the ring and adapted to be turned into pressure engagement with the exterior surface of an associated tube.

The brackets or fixtures mounted on the shelving components can take the form of a downwardly extending pin or lug adapted to be inserted into the groove in the retainer ring. In one form of the invention, each bracket is of L-shaped configuration, and comprises a first leg adapted to extend over the annular lip bounding the groove in the retainer ring, with the second leg extending downwardly for insertion into the groove. The brackets and retainer rings are preferably so dimensioned that, when the second leg is inserted into the groove, it bears upon the outer side wall of the groove or recess and, at the same time, the outer surface of the ring is closely adjacent to or in contact with the exterior of the shelving component.

By this arrangement, a continuous or gliding adjustment of each cabinet or other shelving component can readily be effected along the tubes. A standard type of steel, or other tubing can be used in the assembly of the present invention without any additional treatment or processing thereof, thereby dispensing with the labor-consuming steps which have been necessary in the fabrication of side walls used heretofore in shelving assemblies. The costly, specially machined parts which are ordinarily required in known shelving structures, therefore, can be replaced by relatively simple parts which require very little machining. The individual components can be readily pegged together, and can be adjusted and locked immediately in any desired position. As a result, production costs are dramatically reduced and, in addition, a user's assembly time is also reduced. The retaining rings utilized can be mass-produced parts fabricated for example on a lathe, and can accordingly be produced very economically. The overall shelf assembly has an esthetically pleasing appearance, and affords an enormous variety of potential configurations and combinations inasmuch as the individual shelving components can be combined in various combinations with one another without restriction as to their precise positioning or height to provide any desired combination of components in an extremely stable and robust configuration.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of a multi-element shelf assembly constructed in accordance with one embodiment of the present invention;

FIG. 2 is a front view of another embodiment of the shelf assembly of the present invention;

FIG. 3 is a side view of the embodiment shown in FIG. 2;

FIG. 4 is a detailed view, in partial section, showing a support tube, retaining ring, mounting fixture, and associated shelf element;

FIG. 5 depicts a typical mounting bracket, retaining ring, and grub screw; and

FIG. 6 is a plan view of the mounting bracket and support ring shown in FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIGS. 1–3, and in FIG. 4, the shelf assembly of the present invention uses, in place of conventional side walls, a plurality of vertical chrome-plated steel tubes 1 preferably of circular cross section. The tubes are disposed in pairs with each pair of tubes being interconnected by means of a connecting member or tube 2 (see FIG. 3) which extends in a horizontal direction and which is welded, or otherwise attached, at its opposing ends to the tubes of each pair. Two pairs of tubes (i.e. four tubes in all) are disposed in spaced relation to one another along the vertical edges of a rectangular parallelepiped configuration to define a region therebetween adapted to receive one or more shelving components such as shelf elements 3, cabinets (of various different heights) 5, clothing hanger units (see FIG. 2), drawer units (see FIG. 1), the top of an outwardly extending desk or table (not shown), etc. The number of parallelepiped configurations provided for supporting shelving components in placed can be increased simply by the addition of additional pairs of tubes, e.g. as shown in FIG. 2, three pairs of tubes can be provided to define two side-by-side mounting volumes or, as shown in FIG. 1, four pairs of tubes 1 can be mounted side-by-side to provide three such mounting volumes. The number of tubes employed can be increased as desired within the limitations of the space available for units, and the shelving component configuration which is desired.

Each shelf element 3 is provided with a pair of integral, upstanding end walls of boundary walls 4 (see FIG. 4) at its opposing ends to provide barriers at the end of each shelf unit adapted, for example, to support books in place; and two mounting brackets or fixtures (to be described subsequently in reference to FIGS. 4–6) are attached to each end wall 4 whereby each shelf unit 3 is supported at four spaced points. The cupboard, drawer, or cabinet elements are provided with pairs of fixtures at both their upper and lower ends, on each side thereof, whereby each such unit is supported at eight points (as depicted in FIGS. 1–3).

Each support point is defined by a retainer ring freely slidable along the supporting pole and adapted to be clamped at any desired height thereon, cooperating with a bracket or fixture which is affixed to the shelving component at said support point, as best shown in FIGS. 4–6.

Each retainer ring 11 is of cylindrical configuration and has a pair of bores, of different diameters, therein. The lower bore (see especially FIGS. 4 and 5) has a diameter which closely conforms to the outside diameter of tube 1, whereby the ring 11 may be freely slid to any desired position along tube 1; and the ring is provided with a horizontally extending tapped hole adjacent the lower bore, adapted to receive a threaded grub screw 12 having a hexagonal recess at its outer end whereby screw 12 can be turned down into forceable contact with the exterior of a tube 1 to lock the ring at any desired vertical position on said tube, and said grub screw can be released when it is desired to reposition ring 11 on tube 1. The upper bore provide in each ring 11 is preferably coaxial with the aforementioned lower bore and is of larger diameter so as to define an annular lip on the upper side of each ring which is spaced outwardly of the tube 1 by an intervening groove 10 adapted to receive a pin or lug forming a portion of the bracket or fixture mounted upon the shelving component.

The fixture or bracket construction, as also shown in FIGS. 4-6, comprises a generally L-shaped member 8 having an upper leg extending horizontally in a direction outwardly of the shelving component, and a second leg extending downwardly from the outer end of said first leg to define a pin or lug 9 which can be inserted into the recess or groove 10 formed at the upper side of retainer ring 11. The fixture 8 is mounted in place by means of a threaded fastener or screw 6 which extends horizontally through a bore in the shelving component into thread engagement with a tapped hole 7 formed in the first leg of bracket 8.

The length of the first or upper leg of bracket 8, between the outer side of component 4 and the inner side of pin 9, when the bracket 8 is mounted in place on the shelving component, is substantially equal to or very slightly longer than the width of the annular lip formed around groove 10 in the upper side of ring 11; and the width of each pin or lug 9 is slightly less than the width of the annular groove formed in the upper side of ring 11 when the ring is mounted in place on a tube 1. By reason of these dimensional considerations, when the pin 9 is inserted into the groove or recess in ring 11 as shown in FIG. 4, the first leg of the bracket overlies the lip around the upper side of ring 11, the downwardly extending lug or pin 9 is in firm contact with the side wall of recess 10, and the outer rim 13 of the retainer ring 11 is in firm contact with the adjacent wall 4 of the shelf element. The assembled structure is, accordingly, extremely stable and robust.

When shelving components are mounted side-by-side, as shown in FIGS. 1 and 2, a given ring on an intervening tubular support member is adapted to receive fixtures extending from each of the side-by-side shelving components (i.e. the pins of the two fixtures are inserted into spaced portions of the recess or groove in the upper side of said ring). In such a configuration, moreover, as also shown in FIGS. 1 and 2, the outer rim of each ring is in firm contact with each of the side-by-side shelving components.

While I have thus described preferred embodiments of the present invention many variations will be suggested to those skilled in the art. The foregoing description is intended to be illustrative only, therefore, and not limitative of the present invention; and all such modifications as are in accord with the principles described are meant to fall within the scope of the appended claims.

Having thus described my invention I claim:

1. An assembly comprising:

a plurality of spaced apart, vertically extending, smooth surfaced tubular support members,

a plurality of retainers each encircling a corresponding one of said tubular members for sliding movement longitudinally therealong and for movement to selected rotational positions thereabout, each of said retainers having a vertically extending lip portion defining a horizontal surface and a vertically opening circular recess surrounding said one tubular member and a vertical outer surface extending parallel to said one tubular member,

a plurality of releasable clamping means each engaging a corresponding one of said retainers for clamping said one retainer to said one tubular member at a desired vertical position therealong and a desired rotational position thereabout,

a shelving component positioned between said tubular members, said component having a horizontal portion extending between said spaced apart tubular members and integral end wall portions at opposing ends of said horizontal portion and extending vertically adjacent said tubular members, and

a plurality of bracket means each mounted on the outer surface of a corresponding end wall portion of said shelving component in vertically spaced relation from said horizontal portion, each of said bracket means having a first leg extending horizontally from said corresponding end wall portion and engaging said lip horizontal surface of a corresponding one of said retainers and a second leg extending vertically from said first leg and engaging said recess,

said bracket means, said shelving component and said retainers cooperating for supporting and stabilizing the assembly, by the engagement of said lip horizontal surface with said first leg simultaneously with the engagement of said retainer outer surface with the outer surface of said end wall portions of said shelving component.

2. The assembly of claim **1** wherein said first leg includes a threaded bore, and a threaded fastener member extending through an end wall of said component into thread engagement with said threaded bore for mounting said bracket means on said component.

3. The assembly of claim **1** wherein said plurality of tubular members comprise two pairs of tubular members disposed in spaced relation to one another along the vertical edges of a rectangular parallelepiped configuration.

4. The assembly of claim **3** including a horizontally extending tube disposed between each pair of tubular members for connecting the tubular members in each pair to one another.

5. The assembly of claim **1** wherein said plurality of tubular members comprise first, second, and third pairs of tubular members disposed in spaced relation to one another, said first and second pairs of members being positioned to define the vertical sides of a first parallelepiped configuration, and said second and third pairs of members being positioned to define the vertical sides of a second parallelepiped configuration, said shelving component being located within the bounds of said first parallelepiped, a further shelving component located within the bounds of said second parallelepiped, each of said shelving components including bracket means in common engagement with spaced portions of the same retainers on said second pairs of members, said retainers on said second pair of members being dimensioned to fit tightly against said end wall portions of both of said shelving components.

6. The assembly of claim **1** wherein said shelving component comprises a cabinet.

7. The assembly of claim **1** wherein each of said releasable clamping means comprises a set screw penetrating said one retainer for engagement with the exterior of said one tubular member.

* * * * *