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Siegal

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[54] SHELF SUPPORT STRUCTURE

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[58] Field of Search 248/245, 241, 243, 244, 248/246, 247, 248; 211/134, 148; 108/152, 106, 108

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[57] ABSTRACT

Shelf structure for positioning shelves in infinitely variable vertical positions between a pair of standards, the standards each having a vertically extending groove which receives a locking means arranged to be slidably mounted within the groove, the locking means having a gripping portion extending inwardly of the standards to permit vertical positioning of the locking means within the grooves, in combination with a shelf support means which has inclined wedge surfaces thereon arranged to engage complementarily shaped surfaces on the locking means to lock the shelf support at a predetermined vertical position along the standards.

5 Claims, 4 Drawing Figures

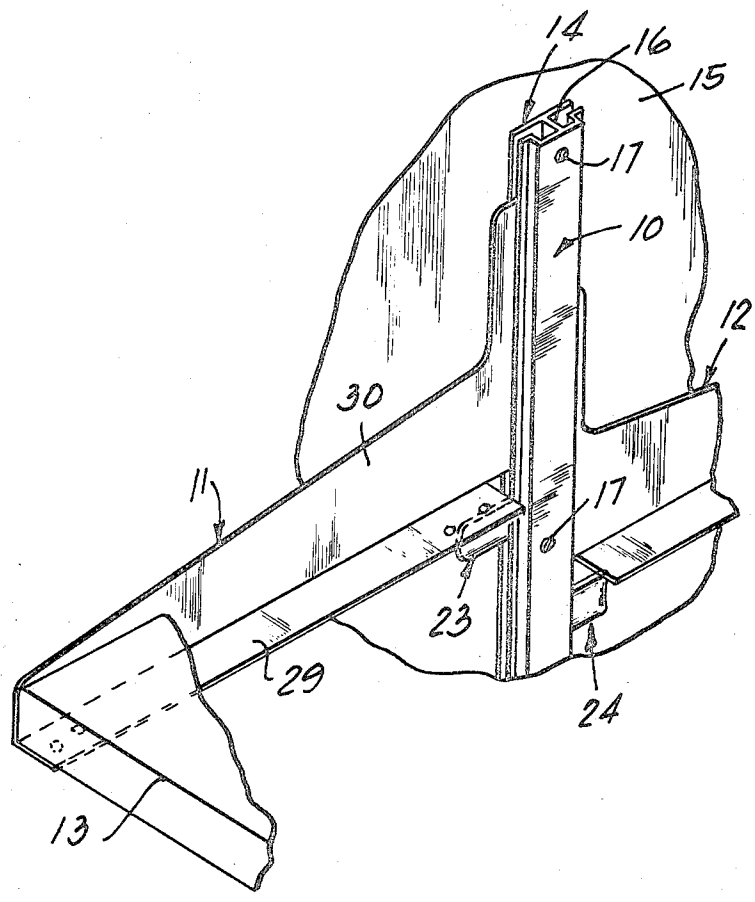


Fig. 1

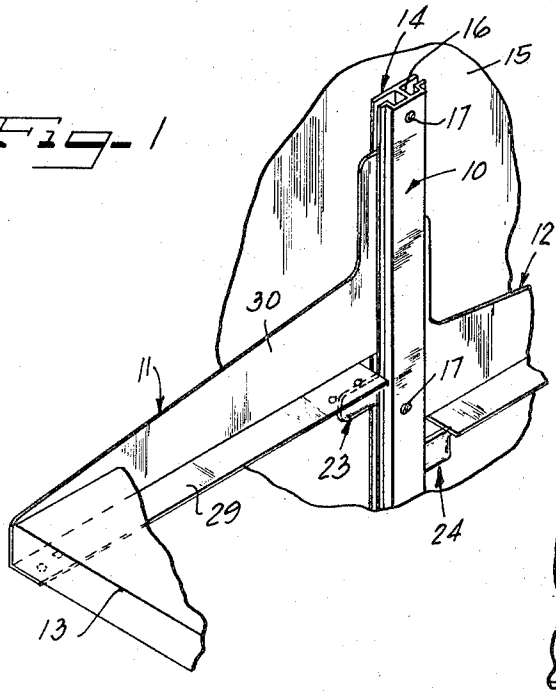


Fig. 2

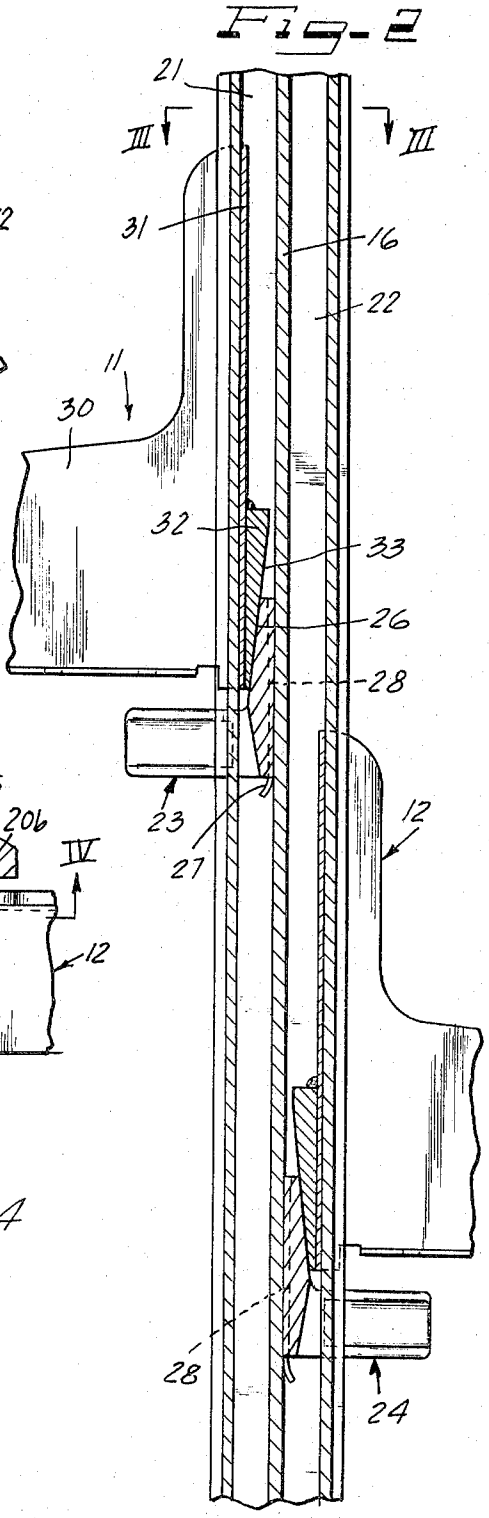


Fig. 3

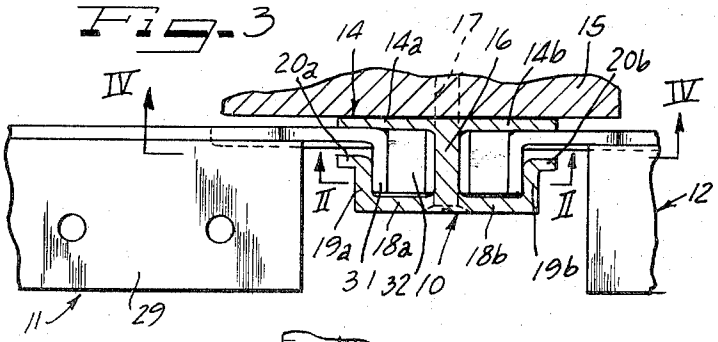
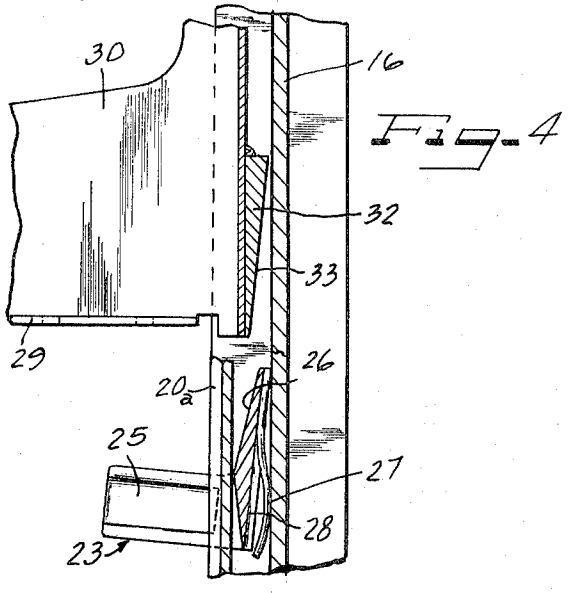


Fig. 4



SHELF SUPPORT STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is in the field of support structures for shelves employing a pair of spaced standards and shelf support means which cooperate with the standards to enable the shelves to be positioned at any desired level relative to the standards.

2. Description of the Prior Art

By far the most common type of shelf support structure commercially available today employs a pair of standards which have a series of slots extending vertically therealong, the slots usually being on 1 inch centers. The shelf support means employed with such slots includes engaging means which pass through the slots and are supported within the standard behind the slots. With this arrangement, of course, it is only possible to change the vertical positioning of the shelves by increments of 1 inch, and no intermediate adjustment between the 1 inch increments is possible.

SUMMARY OF THE INVENTION

The present invention provides an improved shelf support structure in which the standards each has a continuous vertical groove. In each of the grooves, there is provided a locking means which is slidably mounted within the corresponding groove, the locking means having a portion extending beyond the groove in the standard to enable manipulation thereof within the groove. The locking means, in the portion which is slidable in the groove, has an inclined wedge surface which mates with a complementarily shaped wedge surface on a shelf support so that as the two inclined wedge surfaces are brought into contact, a point of engagement is reached due to the camming action between the wedge surfaces where the weight of the shelf is fully supported in a predetermined position along the standards.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments 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 view in perspective of a shelf support assembly of the type involved in the present invention;

FIG. 2 is a fragmentary vertical sectional view illustrating a pair of shelf supports locked within their corresponding slots by means of the locking means of the present invention; the section being taken along the line II—II of FIG. 3;

FIG. 3 is a cross-sectional view taken substantially along the line III—III of FIG. 2; and

FIG. 4 is a fragmentary cross-sectional view similar to that of FIG. 2, but showing the shelf support means and the locking means just prior to engagement for locking purposes.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For purposes of convenience, we have illustrated in the drawings a single standard 10 being used to position a pair of shelf support structures generally illustrated at

reference numerals 11 and 12, respectively. While only one standard is illustrated, it should be evident that another standard will be positioned in spaced relation to the first standard by width of the shelf 13 which is to extend therebetween. It should also be recognized that the shelf support structure 11 which may be termed a "left-hand" structure will have minor design differences between its opposite number or "right-hand" shelf structure but these differences do not go to the substance of the present invention.

The standard 10 includes a web portion 14 arranged to be positioned against a suitable supporting surface 15, and a medial web portion 16 extending transversely to the plane of the web portion 14. Suitable holes are drilled in the web portion 14 and in the web portion 16 to accommodate screws 17 or other securing means for securing the standard 10 to the support surface 15.

As best seen in FIG. 3, the web 14 has a sidewall portion 14*a* on one side of the medial web 16 and another sidewall portion 14*b* on the opposite side thereof. Opposed to these sidewall portions 14*a* and 14*b* are spaced sidewall portions 18*a* dnd 18*b*, respectively. The sidewall portion 18*a* has an inwardly turned flange portion 19*a* and terminates in a marginal end portion 20*a* which is parallel to the extreme marginal edge of the sidewall portion 14*a*. Similarly, the sidewall portion 18*b* has a flange portion 19*b* extending at right angles thereto which terminates in a marginal end portion 20*b* which extends in parallel spaced relationship to the sidewall portion 14*b*. The medial web portion 16, the sidewall portions 14*a* and 18*a*, as well as the end portions 19*a* and 20*a* thus define a continuous vertically extending groove identified at reference numeral 21 in FIG. 2. Similarly, the medial web portion 16, the sidewall portions 14*b* and 18 *b*, as well as the end portions 19*b* and 20*b* define the continuous vertically extending groove identified at reference numeral 22 in FIG. 2.

Slidingly received within the grooves 21 and 22 are a pair of locking means generally indicated at reference numerals 23 and 24. The locking means 23 includes a finger-gripping portion 25 extending outwardly from the groove 21 to facilitate moving the locking means 23 vertically with respect to the groove. As best illustrated in FIGS. 2 and 4, the locking means 23 has a portion thereof fitting into the groove 21, which portion includes an angularly inclined wedge surface 26. In order to retain the locking means 23 within the groove 21 when no weight is applied thereto, there is provided a wire form spring 27 which abuts against the medial web 16 and exerts sufficient biasing pressure on the locking means 23 to keep it from falling down the groove. When the locking means are engaged in locking position with the shelf support structure, as illustrated in FIG. 2, the lower end of the wire form spring 27 is received in a groove 28, best illustrated in FIG. 4.

The shelf support 11 and the shelf support 12 include a horizontally extending load supporting surface 29 having an angularly formed vertical wall portion 30. The shelf support also has an inwardly turned flange portion 31 which is proportioned to be received against the end wall portion 19*a* in sliding engagement with the groove 21. At the bottom of the flange portion 31 there is secured a wedge element 32 having an inclined wedge surface 33, typically inclined at about 6° to the vertical. The inclination of the surface 33 is complementary to that of the surface 26 on the locking means, that is, the two angular surfaces form a right angle. The

thicknesses of the wedge member 32 and the wedge surface 26 are such that upon engagement, as shown in FIG. 2, a position is reached where the interengaging wedge surfaces cause the locking means 23 to be tightly received against the medial web portion 16 with the wire form spring 27 being pushed into the groove 28. The weight of the shelf supporting structure and the shelf is thus applied against the locking means 23 and the medial web 16.

With the support structure of the present invention, it is a simple matter to position the shelves at any desired incremental location along the extent of the vertical standards by simply manipulating the locking means 23 to the desired position, and then sliding the shelf support 11 downwardly until wedging engagement is achieved between the shelf support and the locking means thereby securely anchoring the shelf support in the predetermined position.

The shelf support structure of the present invention thus provides an economical and convenient means for positioning shelves between a pair of standards in readily releasable engagement.

It should be evident that various modifications can be made to the described embodiments without departing from the scope of the present invention. For example, the improved locking means can be included in single standards rather than the dual standards illustrated in the drawings to serve, for example, as a picture hanging means. The standard may also be recessed into a panel or it may be mounted by any suitable type of flange formed integrally with the slot enclosing walls.

I claim as my invention:

1. A shelf support structure comprising a pair of spaced standards, each having a vertically extending groove therealong, a locking means arranged to be slidably mounted within each of the grooves, said locking means having a gripping portion extending from the grooves in the standards to permit vertical positioning of said locking means within said grooves, said locking means also having inclined wedge surfaces disposed within said grooves, spring means biasing said locking means into engagement with the walls of said grooves to hold said locking means at a predetermined elevation, and shelf support means including inclined wedge surfaces arranged to mate with the aforementioned inclined wedge surfaces on said locking means to lock said shelf support structure at a predetermined position along said standards.

2. The shelf structure of claim 1 in which said spring means is a wire form spring secured to said locking means and said locking means has a groove therein to receive the spring when said shelf support means is loaded onto said locking means.

3. The shelf structure of claim 1 in which said vertically extending groove is formed in a channel having a continuous rear wall, spaced sidewalls extending in parallel relation to said rear wall, and an inner wall extending from one of said sidewalls and terminating short of the other of said sidewalls.

4. The shelf structure of claim 3 in which said shelf support means has a flange portion proportioned to be received in slidable engagement with the inner surface of said inner wall.

5. The shelf structure of claim 3 in which said inner wall terminates in a right angle portion extending in parallel spaced relation to the other of said sidewalls.

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