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Selenke

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[54] **ADJUSTABLE SUPPORT**

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[51] **Int. Cl.** **E04b 2/78**

[58] **Field of Search** 248/221, 124, 125, 248/243, 235; 211/107, 110, 111, 112, 148; 108/108, 107, 109

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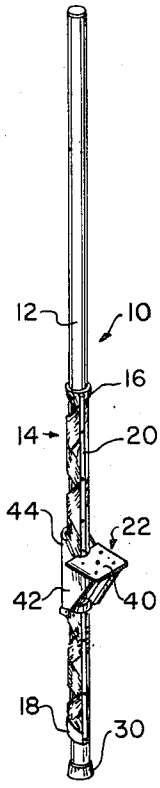
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Attorney—John E. Reilly

[57] **ABSTRACT**

An adjustable support for positive suspension of articles such as brackets, steps, partition walls and the like comprises an elongated rigid rod having flexible straps or cables of inextensible material wrapped at least partially therearound so as to converge at spaced intervals to define reinforcing areas. The straps at reinforcing areas define suspension locations at which reinforcing clips are retained in vertically spaced positions along the length of the rod. The bracket or other object being suspended from the support includes a downwardly projecting finger insertable vertically into limited space formed between the clips and the outer surface of the rod to positively retain the article in a selected position.

15 Claims, 9 Drawing Figures



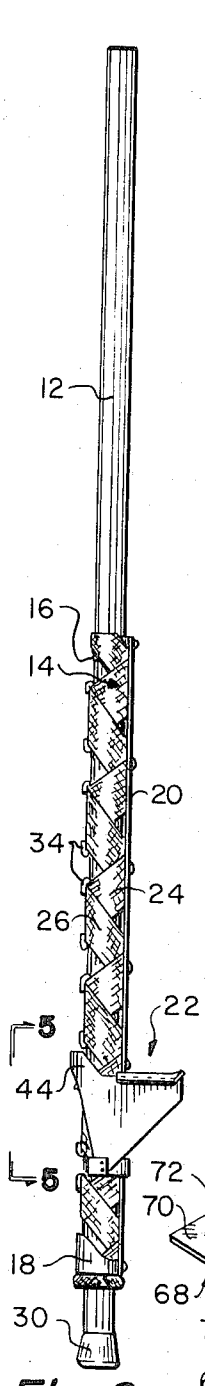


Fig_2

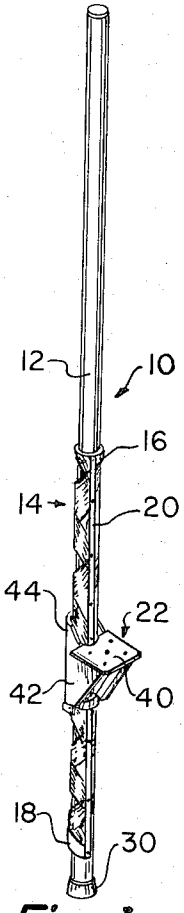


Fig_1

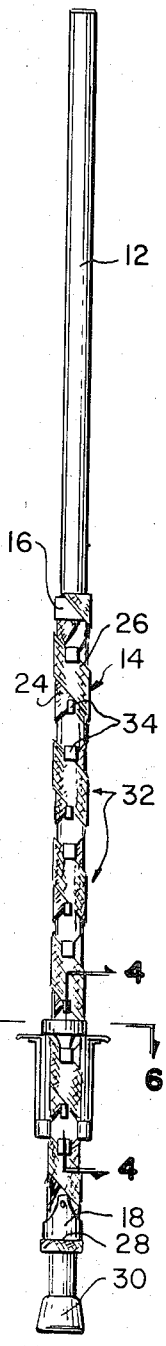


Fig_3

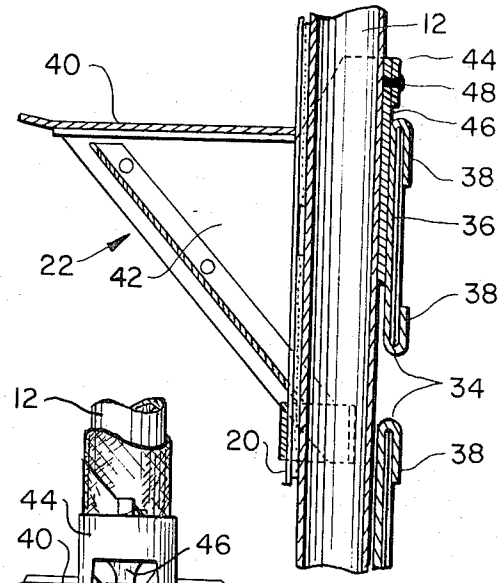


Fig_4

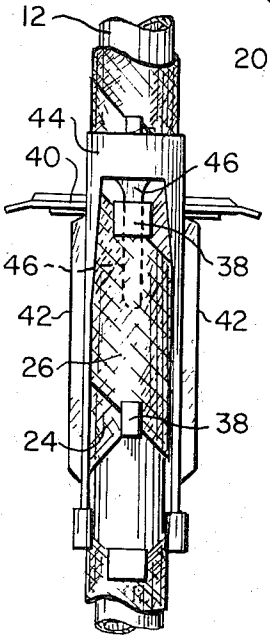


Fig_5

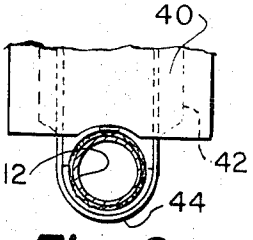


Fig_6

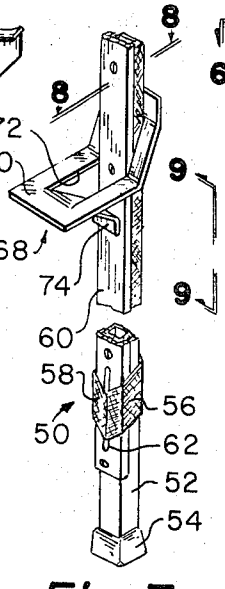


Fig_7

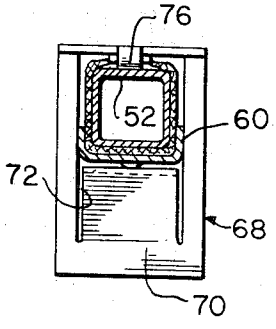


Fig_8

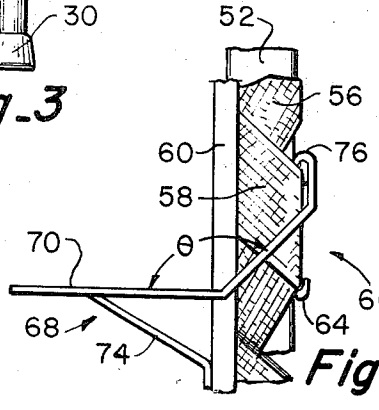


Fig_9

ADJUSTABLE SUPPORT

The present invention generally concerns a supporting device for adjustable and releasable suspension of articles and more specifically concerns a support rod characterized by its relative simplicity of construction and strength and which can be employed singly or in pairs to define vertically spaced positions along the length thereof at which brackets, steps, partition walls or the like can be removably suspended.

Various types of supports have been contrived for suspending brackets on which shelving or other items can be retained at selected locations along the length of the support. Typically, the supports take the form of channelled or hollow support bars in which vertically spaced slots have been cut for releasable reception of hooked end portions of brackets. The brackets can then be positioned at selected locations along the length of the bar to support shelving or other items at desired elevations.

The adjustable support of the present invention is suitable for suspending various articles such as partition walls, brackets for shelving or other material and also for suspending steps upon which individuals can stand to use the support as a stilt or pogo stick type of device. The support is therefore useful singly or in combination for both utilitarian and recreational purposes. Basically, the support comprises an elongated rod having high strength straps, ropes, cables or the like of longitudinally inextensible material wrapped at least partially therearound defining suspension locations at which desired articles can be removably suspended. More specifically, the adjustable support comprises an elongated rod on which straps of high strength material are wrapped at least partially therearound so as to converge at spaced intervals to define reinforcing areas and suspension locations at which metal reinforcing clips are placed in vertically spaced positions along the length of the rod. In the preferred embodiment described in detail hereinafter, the straps are wrapped spirally around the rod such that the reinforcing areas are defined by the overlapping areas of the straps. The clips are positioned closely adjacent the rod so that the downwardly projecting finger of a bracket or step to be suspended from the support can be inserted between the clip and the support rod and held firmly in place by the high strength straps, ropes, cables or the like.

Accordingly, it is an object of the present invention to provide an adjustable support device which is characterized by its relative simplicity of construction and strength.

It is another object of the present invention to provide an adjustable support adapted for use singly or in combination for supporting partition walls, shelving brackets and the like or for supporting steps so that the support can be used as a stilt or pogo stick type of recreational device.

It is another object of the present invention to provide an adjustable support having straps, ropes, cables or the like of high strength material wrapped at least partially therearound defining vertically spaced suspension locations for brackets, steps or the like.

It is another object of the present invention to provide an adjustable support device having an elongated support rod with straps of material wrapped spirally in opposite directions around the rod to form overlapping areas in which reinforcing clips are positioned for positive retension of suspended partition walls, brackets, steps or the like.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of an adjustable support of the present invention having a bracket member suspended therefrom;

FIG. 2 is an enlarged side elevation of the support of FIG. 1;

FIG. 3 is a front elevation of the support of FIG. 2;

FIG. 4 is an enlarged section taken along line 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary view taken in the direction of the arrows 5—5 of FIG. 2;

FIG. 6 is an enlarged fragmentary section taken along line 6—6 of FIG. 3;

FIG. 7 is a fragmentary view of a second embodiment of the adjustable support of the present invention;

FIG. 8 is an enlarged section taken along line 8—8 of FIG. 7 and;

FIG. 9 is a fragmentary side elevation of the support shown in FIG. 7 looking in the direction of arrows 9—9 of FIG. 7.

One embodiment **10** of the adjustable support of the present invention is shown in FIG. 1 including a rigid support rod **12**, elongated longitudinally inextensible strap means **14** secured to the support rod by upper and lower attachment collars **16** and **18** respectively and a longitudinally extending brace **20** so as to be appropriately disposed for suspending a bracket type member **22** in selected vertically spaced positions.

Looking at FIGS. 2 and 3, it will be seen that the inextensible strap means **14** include two straps **24** and **26** which have upper ends tucked inside the upper attachment collar **16** and are wrapped spirally in opposite directions around the support rod **12** toward the lower end thereof. The lower ends of the straps **24** and **26** extend beyond the lower edge of the lower attachment collar **18** and are reversibly folded and passed through a slot **28** in the collar **18** so that the lower terminal ends of the straps are disposed inwardly of the collar **18** and can be retained in position by positively securing the collar to the rigid support rod **12.** In the disclosed embodiment, both the upper and lower collars **16** and **18** are screwed to the rod **12** so that the straps **24** and **26** are prevented from migrating up or down the rod once the collars have been secured in place. To further fix the position of the straps on the support rod and to hold the straps against the rod in tightened flat relationship therewith, the elongated brace **20** is extended up one side of the support rod and is positively attached to each of the attachment collars and to the support rod in spaced locations along the length of the brace to press the straps against the rod so that they are firmly held in place.

In the embodiment **10** of the adjustable support shown in FIGS. 1 through 6, the support rod **12** comprises a tubular member of circular transverse cross-section having a rubber tip **30** on its lower end to reduce the tendency of the lower end to move relative to its supporting surface. The straps **24** and **26** are flexible and substantially longitudinally inextensible so as to have very little give when tightly wrapped around the support rod. A material which has been found to be very well suited for use as the straps, is nylon webbing

of the type used for seat belts in automotive vehicles. It will be appreciated from the drawings, that the two straps **24** and **26** which are wrapped spirally around the support rod in opposite directions define overlapping areas on opposite sides of the support rod where the straps serve to reinforce each other by doubling their effective thickness. The brace member **20** is positioned on the rod so as to pass over the overlapping areas on one side of the rod and the overlapping areas on the opposite sides of the rod define suspension locations **32** at which the bracket **22** or other member to be suspended from the support can be suspended in a manner to be described hereinafter.

To further reinforce the straps **24** and **26** at the suspension locations **32**, reinforcement clips **34** are positioned between the overlapping straps and the support rod. Preferably, the clips **34**, which are best seen in FIG. **4**, are metallic clips having a substantially flat central portion **36** lying against the support rod and hooked end portions **38** which extend reversibly along the opposite side of the outermost strap at the particular suspension location. Accordingly, the clips **34** are positively positioned at the suspension locations **32** and are held tightly against the support rod by the inextensible straps.

The bracket or step type member **22** shown in FIGS. **1** through **5** which has been found to be particularly well suited for suspension from the adjustable support includes a flattened support plate **40** supported by a web shaped base **42** including an arcuate back portion **44** at its upper end substantially corresponding in transverse cross-section with the support rod. A depending retention finger **46** secured as by rivets **48** to the back portion **44** of the webbed shaped base **42** is adapted to be inserted between one of the clips and the support rod **12** so that the finger is tightly pinched between the clip and the support rod to positively hold the bracket **22** in a selected position on the support rod. The finger **46** is an elongated relatively thin bar and is preferably arcuate in transverse cross-section to conform with the external surface of the support rod. The retention finger is adapted to extend beneath a major portion of the overlapping area of the straps so that the bracket **22** when properly positioned on the support is positively held in position by the finger. To position the bracket **22** at another suspension location on the support, it is merely necessary to lift the bracket until the retention finger slides out from between the clip and the support rod and slide the bracket along the support rod to the desired suspension location where the finger can be forced between the support rod and the clip at the new suspension location.

A second embodiment **50** of the adjustable support is shown in FIGS. **7** through **9**, and can be seen to include a support rod **52** of square transverse cross-section with a rubber tip **54** on its lower end serving the same function as the rubber tip **30** on the embodiment **10** described with reference to FIGS. **1** through **6**. The embodiment **50** shown in FIGS. **7** through **9** is similar to the embodiment **10** in that two elongated flexible but inextensible straps **56** and **58** are wrapped spirally in opposite directions around a portion of the length of the support rod **52** and are anchored at their upper ends with an upper collar, not shown, identical to the upper collar **16** described in the first disclosed embodiment and anchored at their lower ends by passage around the outside edges of a channelled vertical brace member **60** having a longitudinal slot **62** near its lower end through which the ends of the straps are inserted and pinched against the support rod **52** for positive retention by the brace member. The brace **60** is anchored to the upper collar and the support rod at selected locations along its length by screws or other fastening means. Reinforcement clips **64**, identical to the clips **34** described in connection with the first embodiment **10**, are positioned at overlapped locations **66** along the length of the support rod so that a bracket or step type member **68** can be suspended from the adjustable support at the overlapped locations.

A bracket **68** found suitable for use with this embodiment of the adjustable support is shown on the support including an elongated base portion **70** which has been transversely bent so as to have an included obtuse angle. A central longitudinal portion of the base is partially cut away to define a rectangular opening **72** and a downwardly bent brace portion **74** adapted to rest against the channelled brace **60** overlying the straps. The upper end of the base portion **70** includes an inwardly bent depending retention finger **76** which is adapted to fit tightly between a clip **64** and the support rod **52** when the rod is received in the rectangular opening **72** in the base so that the straight sides of the rectangular opening lie against opposing sides of the support rod to prevent relative rotation between the bracket and the support rod. The retention finger **76** is preferably flat to lie flush with the side of the support rod and be tightly received between a clip and the support rod to positively maintain the position of the bracket. Again, as in the first described embodiment, the position of the bracket on the support rod can be changed merely by lifting the bracket so that the finger slides out from between the clip and the support and positioning the bracket in a similar manner at another of the vertically spaced overlapping locations.

It can be seen from the foregoing description that the adjustable support of the present invention is relatively simple in construction so as to be economical to manufacture and yet provide adequate strength for supporting weights which are relatively large in comparison to the weight of the support. Numerous uses of the support will be readily apparent to those skilled in the art and one of the most readily apparent uses would be as an adjustable support for temporary shelving. More specifically, a plurality of support rods could be provided with spring biased extensions at their upper ends so that the support rods could be positively positioned between the ceiling and floor of a room in which the shelving is to be installed. Elongated planks of shelving material could then be laid upon the brackets at desired elevations along the length of the support rods to form the shelves. It can be appreciated that more than one bracket could be positioned on a support rod so that a number of vertically spaced shelves could be supported on the same support rods for varied and interesting shelving arrangements. The support rod could also be used in a similar manner to support partition walls having depending fingers adapted to fit snuggly between clips and the support rod at suspension locations.

Another readily apparent use of the adjustable support rod would be as a walking stilt wherein a pair of the supports each having a step type member suspended therefrom at a desired elevation would form effective extensions of a users legs so that he could walk by grasping an upper portion of the support with his

hands and moving the support along with his legs in a walking fashion.

A similar use would be as a pogo stick wherein a modification of the step type bracket herein disclosed could be used which would include support plates on either side of the support rod so that a user could position the support rod between his legs with one foot on each of the supporting plates and bounce along by use of a spring biased extension from the bottom end of the support rod. The pogo stick arrangement could be made increasingly or decreasingly difficult by adjusting the elevation of the step type bracket along the length of the support rod.

Other uses of the support device of the present invention will no doubt be apparent to those skilled in the art since the support is of high strength for numerous heavy duty utilitarian uses and is light weight so as to be easily maneuverable and useful as a recreational device such as of the type hereinbefore described.

While the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.

What is claimed is:

1. An adjustable support for articles, said support comprising a rigid rod, continuous elongated flexible and longitudinally inextensible means wrapped at least partially around said rod to define longitudinally spaced suspension locations along the length of the rod, said articles being removably inserted between the inextensible means and said rod whereby the article is positively suspended from the adjustable support in a fixed immovable position.

2. The adjustable support of claim 1 further including reinforcement means at said suspension locations to reinforce the inextensible means for more rigid suspension of said article.

3. An adjustable support for articles, said support comprising a rigid rod, a pair of elongated flexible and longitudinally inextensible straps wrapped spirally in opposite directions around the rod overlapping in areas spaced along the length of the rod to define suspension locations, said suspension locations serving to retain a portion of the article between the inextensible straps and said rod whereby the article is positively suspended from the adjustable support in a fixed, immovable position.

4. The adjustable support of claim 3 further including reinforcement means at said suspension locations to reinforce the strap means for more rigid suspension of said articles.

5. The adjustable support of claim 4 wherein said reinforcement means are clips which are connected to the strap means at the suspension locations and are disposed between the straps means and the rigid rod.

6. The adjustable support of claim 5 wherein said article includes at least one depending finger adapted to fit snugly between a clip and the rigid rod.

7. The adjustable support of claim 6 wherein said article is a bracket type member having an opening therethrough in which the rigid rod passes when the finger portion of the bracket is between a clip and the rigid rod.

8. The adjustable support of claim 5 further including clamping collars at both ends of the strap means to retain the strap means in their prelocated positions.

9. The adjustable support of claim 8 further including an elongated brace member secured to the rigid rod along the length thereof and overlying the strap means to further retain the strap means in their prelocated positions.

10. The adjustable support of claim 9 wherein said rigid rod is circular in transverse cross-section and said brace member is arcuate in transverse cross-section.

11. The adjustable support of claim 9 wherein said rigid rod is square in transverse cross-section and said brace member is U-shaped in transverse cross-section.

12. The adjustable support of claim 7 wherein said rigid rod is square in transverse cross-section and said opening through the bracket type member has opposing straight side portions that align with straight sides of the rigid rod to prevent the bracket from rotating relative to the rigid rod.

13. The adjustable support of claim 5 wherein said clips comprise metallic members having a relatively flat central portion which is disposed between the strap means and the rigid rod and hooked end portions to positively retain the clips in place at the overlapping areas of the straps.

14. An adjustable support for bracket type members comprising at least one rigid elongated rod, each rod including a pair of elongated flexible and longitudinally inextensible straps, collar means anchoring one end of said straps to each said rod, said straps being wrapped spirally in opposite directions around each rod defining longitudinally spaced overlap locations where the straps serve to reinforce each other, means for anchoring the opposite ends of said straps to each said rod, an elongated brace member extending along the portion of said rod which is wrapped by the pair of straps in overlying relationship with the straps and being secured to the rod to firmly hold the straps in position on said rod, and metal clips positioned between said rigid rod and the straps at the overlapping locations whereby a depending finger portion of a bracket type member to be suspended from the adjustable support can be tightly received between the rigid rod and the clip to retain the bracket type member in a predetermined position on the adjustable support.

15. The adjustable support of claim 14 wherein said straps are composed of nylon webbing.

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