Oct. 13, 1970 S. T. CHICHESTER, JR 3,533,586

SUPPORT SYSTEM FOR FURNITURE AND THE LIKE

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Fig. 1

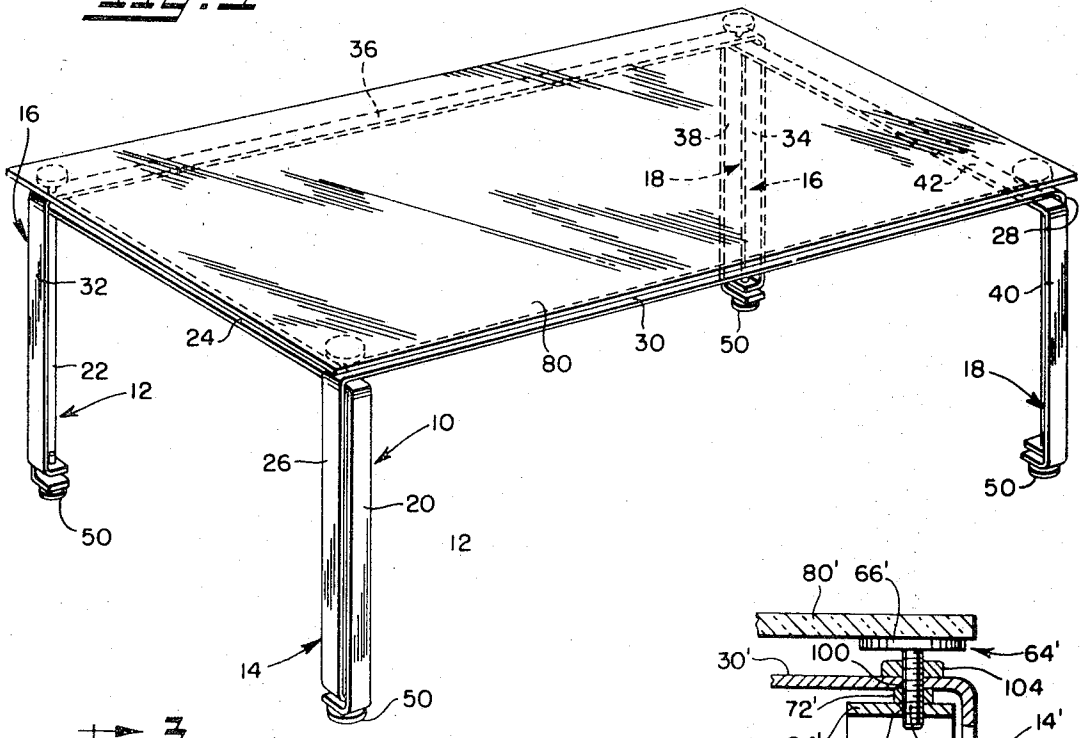


Fig. 5

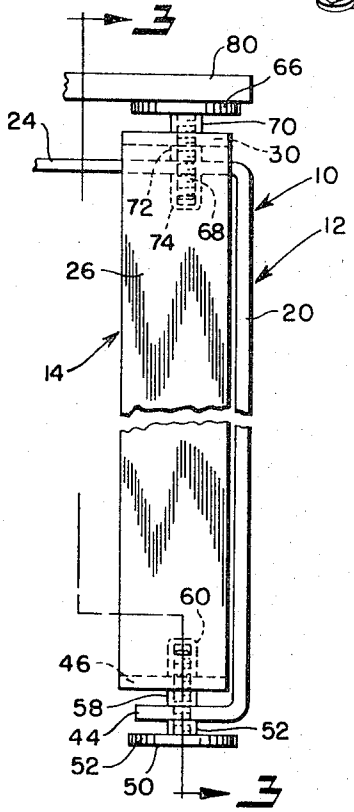


Fig. 2

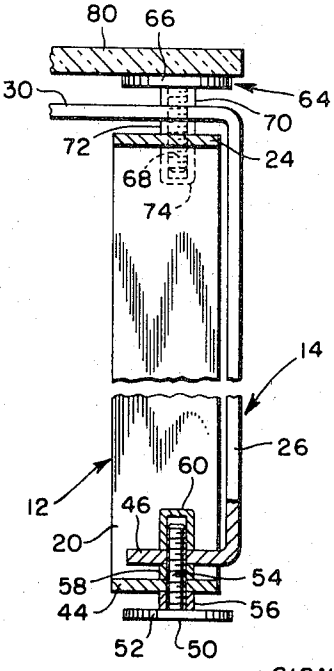


Fig. 3

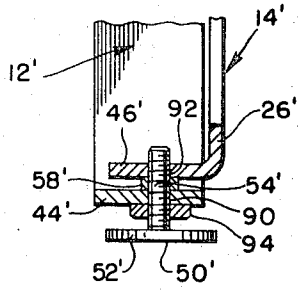


Fig. 4

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SUPPORT SYSTEM FOR FURNITURE AND THE LIKE

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FIG. 6

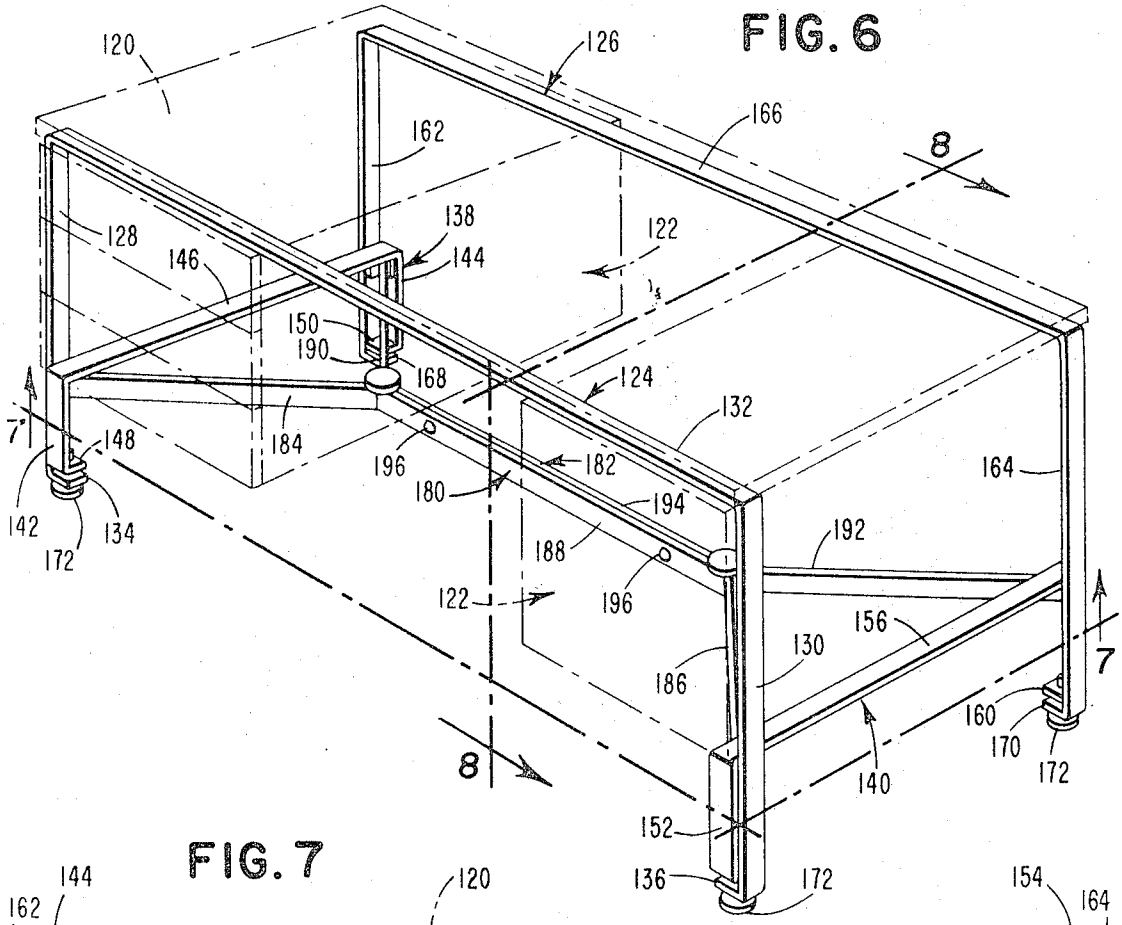
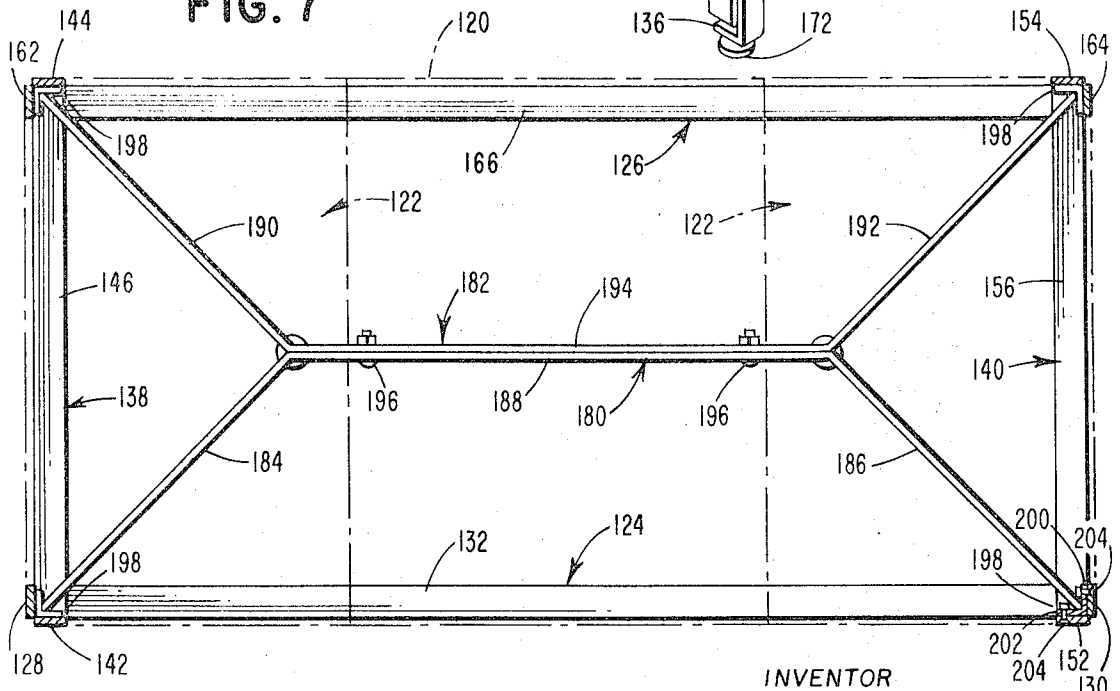


FIG. 7



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SUPPORT SYSTEM FOR FURNITURE AND THE LIKE

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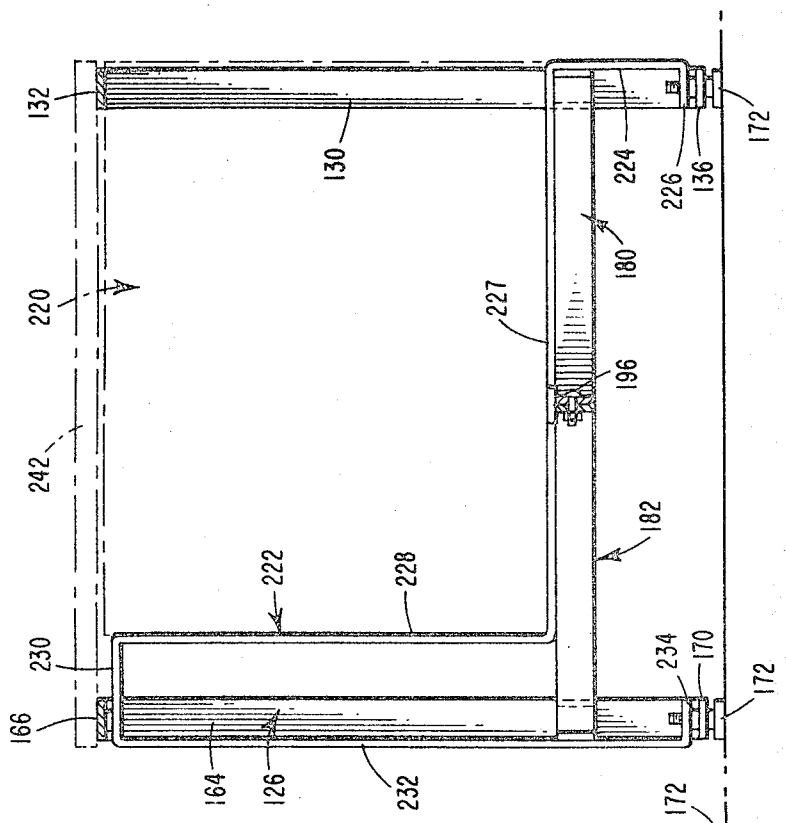


FIG. 9

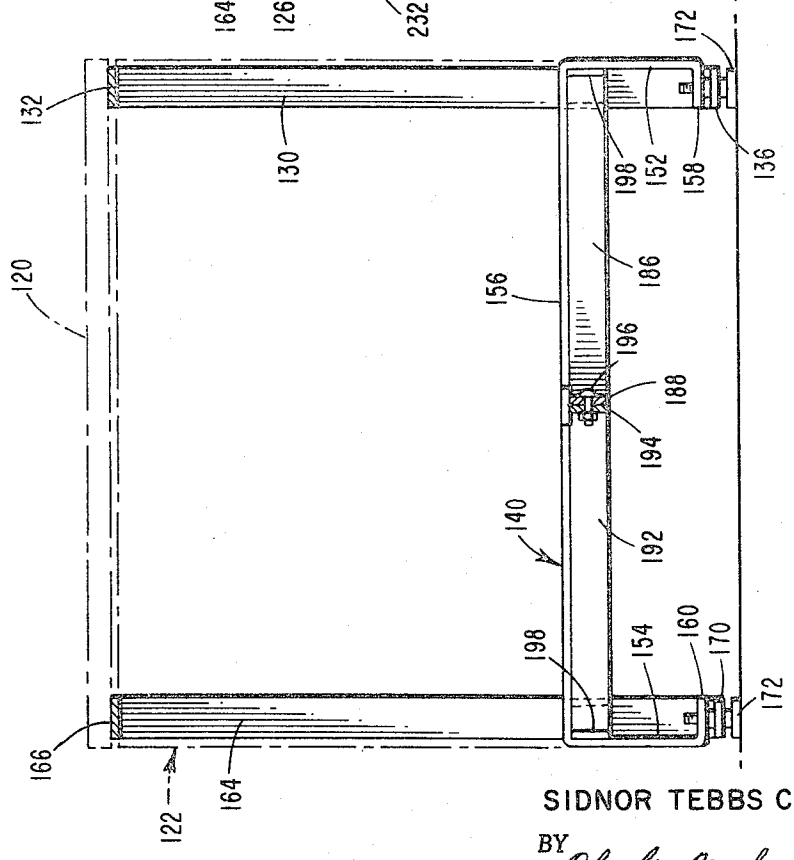


FIG. 8

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United States Patent Office 3,533,586 Patented Oct. 13, 1970

3,533,586

SUPPORT SYSTEM FOR FURNITURE AND THE LIKE

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Continuation-in-part of application Ser. No. 720,166, Apr. 10, 1968. This application Mar. 12, 1969, Ser. No. 806,554

Int. Cl. F16m *11/16*

U.S. Cl. 248—188.1 15 Claims

ABSTRACT OF THE DISCLOSURE

A support system for furniture and the like comprising a plurality of bent strap members uniquely interconnected to afford a strong and rugged support frame on which or to which the associated article of furniture can be positioned and/or secured.

RELATED APPLICATION

This application is a continuation-in-part of my pending application, Ser. No. 720,166, filed Apr. 10, 1968, and entitled "Support System for Furniture and the Like."

BACKGROUND OF THE INVENTION

The present invention relates, as indicated, to a support system for furniture, and more particularly to a rugged support system for supporting tables, desk and the like.

Tables are commonly supported by legs or pedestals rigidly secured to the table top for supporting the same. Where the table is relatively large, the strength and rigidity required of the legs is of controlling significance in the size and shape of the legs and of the manner in which the legs are mounted, essentially permanently, to the table top. Although detachable legs for tables and the like have been known for some time, these have most frequently been associated with relatively smaller tables or other pieces of furniture, and have limitations where strength and rigidity are important considerations. Moreover, these detachable type legs are individually mounted and do not in any way function cooperably to provide a support system.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a furniture support system of simplified construction affording high strength characteristics.

A further object of the invention is to provide a furniture support system that can be shipped or handled as separate components and can be quickly set up prior to use. Specifically, the system comprises a plurality of individual strap members of generally inverted U-shape, which, when interconnected, provide sets of legs and integral top rails which form a supporting surface for a table or the like.

A still further object of the present invention is to provide means for interconnecting adjacently disposed straps at the bottom thereof so as to provide for vertical adjustment of such straps to vary the distance thereof from the supporting surface. A related object is to provide a similar interconnection between the rails of adjacent strap members thereby permitting independent vertical adjustment of the surface directly supporting the table top.

Yet another object of the invention is to provide a support system the basic structural design of which permits an almost infinite number of uses thereof simply by varying the length of the rail sections and the height of the legs of the strap members.

A further object of the present invention is to provide, in an alternative form of the invention, a support system including supplemental rigidifying means for support of relatively heavy table top, desks and the like. Such rigidifying means can similarly be shipped as separate parts and assembled on site.

Further objects of the invention will become apparent as the specification proceeds, wherein reference will be had to the accompanying drawing in which:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the furniture support system comprising the present invention, with a table top being shown, in dashed lines, mounted thereon;

FIG. 2 is a fragmentary side elevational view, looking toward the right at the lowermost corner of FIG. 1;

FIG. 3 is a sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a fragmentary view, similar to the bottom of FIG. 3, showing a modified method of interconnecting the strap members at the bottom thereof;

FIG. 5 is a fragmentary view, similar to FIG. 4, showing the modified method of interconnecting the superimposed rail sections;

FIG. 6 is a perspective view of an alternative form of support system in which rigidifying means in the form of stretcher members are operatively connected to the straps, with the FIG. 6 form illustrating a desk, with the top and pedestals in dashed lines;

FIG. 7 is a bottom plan view looking in the direction of lines 7—7 of FIG. 6;

FIG. 8 is a vertical sectional view taken on lines 8—8 of FIG. 6, and

FIG. 9 is a sectional view similar to FIG. 8, showing a support system adapted to support a desk having abbreviated pedestals.

DETAILED DESCRIPTION

Referring now in detail to said drawings, wherein like parts are indicated by like reference numerals and initially to the form of the invention illustrated in FIGS. 1–3, the support system is generally indicated at **10** and comprises, in the form shown, four separate strap members generally indicated at **12**, **14**, **16** and **18**. These strap members may be manufactured of any desired material, with bent strap steel being entirely satisfactory for this purpose. As shown, the strap steel is relatively thick, for example, approximately ⅜ inch thick, and varies in width depending upon the material and the supporting function of the system. The strap members can be coated or plated if desired, with chrome or bronze finish providing a highly attractive appearance.

Each of the strap members **12–18** is formed by bending the same into a generally inverted U-shape, with member **12**, for example, comprising vertical legs **20**, **22**, interconnected by top rail **24**. Similarly, the strap member **14** comprises legs **26**, **28** and rail **30**; strap member **16** comprises legs **32**, **34** and rail **36**; and strap member **18** comprises legs **38**, **40** and rail **42**.

In the form shown, the strap members **12–18** are of the same height but vary in their length as determined by the length of the rail sections, with strap members **12** and **18** having relatively shorter rails **24** and **42** thus to define the width of the support frame. It will be understood that the length of the strap members will vary depending upon the particular support function desired.

As best shown in FIGS. 2 and 3, the support frame is assembled by disposing the legs of strap members which define the length and width of the support frame adjacent to each other and at right angles. Thus, as seen in FIG. 2, the strap member **12**, which defines the width of the support frame, is disposed at right angles to the strap member **14** and is spaced therefrom. It will be

noted that the rail **30** of the strap member **14** is disposed above the rail **24** of the strap member **12**. Since in the form shown the strap members are of the same height, the bottoms of the legs of the strap members **12** and **14** are likewise vertically spaced from each other.

The lower end of each leg of each strap member is formed with a laterally extending flange disposed parallel to the rail of the strap member and directed toward the opposite leg portion thereof. Thus, as best seen in FIG. 3, the leg **20** of strap member **12** is formed with a bottom horizontal flange **44**, and the leg **26** of strap member **14** is formed with a bottom horizontal flange member **46**. These flanges are vertically spaced and interconnected by means to be presently described.

The legs of the strap members are supported by feet commonly designated at **50**, which in turn engage the floor or like supporting surface. As best seen in FIG. 3, each foot **50** comprises a generally circular head portion **52** and a threaded shank portion **54**. A spacing ring **56** is disposed loosely around the shank **54** for spacing the head **52** of the foot **50** from the flange **44**, with a similar spacing ring **58** being disposed around the shank **54** for vertically spacing the flange **46** from the flange **44**. An internally threaded cap member **60** is provided for threaded attachment to the exposed end of the threaded shank **54** of the foot member for rigidly securing the assembly together.

A similar arrangement is provided for interconnecting and spacing the rails of adjacently disposed strap members. Thus, a plurality of connecting members commonly and generally designated at **64** are provided, with each such connecting member being essentially identical to the feet **50** above described, thus including a generally circular head portion **66** and a threaded shank portion **68**. Spacing rings **70** and **72** are provided to space, respectively, the connecting member from the rail **30** and the latter from the rail **34**. A threaded cap **74** is similarly provided for threaded engagement with the exposed end of the threaded shank **68** for rigidly securing the assembly together.

It will be noted that the top surfaces of the several connecting members **64** provide a flat supporting surface for supporting a table top **80** or the like. Although in the form shown the top **80**, which is depicted as glass, is simply placed upon the connecting members **64** without being secured thereto, it will be understood that some type of mounting may, in certain installations, be desirable and could be provided. It will also be apparent that additional supporting members could be provided spaced along the length of the intermediate portions of the several strap members so as to distribute the weight of the table top.

A modified form of interconnection of the strap members to permit vertical adjustment of the feet and connecting members thereby to vertically adjust the height of the support system is shown in FIGS. 4 and 5. Referring first to FIG. 4, where the same reference numerals have been employed with an attached prime to indicate previously described parts, the shank **54'** of the foot member **50'** extends upwardly through a smooth opening **90** formed in the flange **44'** and into threaded engagement with a threaded opening **92** formed in flange **46'**. In this manner, the elevation of the head portion **52'** of the foot **50'** can be adjusted vertically as desired.

A spacer **58'** is loosely disposed around the shank **54'** to space the flanges **44'** and **46'**, as previously described. A lock nut **94** is carried by the lower portion of the shank **54**, and tightening of the same when the foot has been vertically adjusted serves to lock the latter in place.

Referring to FIG. 5, the rails **24'** and **30'** are interconnected in a similar manner to the flanges just described and illustrated in FIG. 4. Thus, the shank **68'** of the connecting member **64'** extends through a smooth opening **100** formed in rail **30'** and engages a threaded opening **102** formed in the rail **24'**, with a spacer **72'** being similarly provided to space the rail members. The enlarged head **66'** can thus be vertically adjusted simply by threading or unthreading the same in the opening **102** thereby to vary the supporting surface for the table top **80'**. A lock nut **104** is disposed around the upper region of the shank **68'** and serves, when tightened, to rigidly clamp the assembly in place.

It will thus be seen that when the rails and flanges are interconnected in the manner shown in FIGS. 4 and 5, the assembly is highly rigidified in addition to being vertically adjustable, with the load being transferred through the strap members to the floor or like supporting surface.

Where the support system is intended to be used in association with a relatively heavy article of furniture, such as, for example, a desk or heavy table top, or with an article of furniture periodically subjected to substantial weight loads, for example, a chair, the support system is adapted to be further rigidified by interconnection of the individual legs.

Reference is now made to FIGS. 6–8 which illustrate a modified support system adapted to support the individual components of a desk. In FIG. 6, for purposes of clarity, the desk top and the desk pedestals are shown in dashed lines and are generally indicated at **120** and **122**, respectively. The top and pedestals per se form no part of the present invention, and can be constructed in a conventional manner, including, for example, one or more storage or file drawers. It will be understood that the pedestals could vary in size from that shown, and only a single pedestal could be provided.

Referring to the FIG. 6 support system itself, the same comprises front and rear strap members generally indicated at **124** and **126** respectively. The strap **124** includes legs **128** and **130** and top rail **132**, all of which are integrally connected in generally inverted U-shape as shown in FIGS. 1–5 and as described above. The leg **128** terminates at its bottom end in an inwardly turned flange **134**, and the leg **130** is formed with a flange **136**, again in a manner similar to the strap members **12–18** described above.

Strap members generally indicated at **138** and **140**, respectively, extend front to rear and function to space and interconnect straps **124** and **126**. The strap **138** comprises legs **142** and **144** and top rail **146**, with the legs **142**, **144** terminating in inwardly directed bottom flanges **148** and **150**, respectively. The strap member **140** similarly includes front and rear legs **152** and **154** (FIG. 8), respectively, top rail **156**, and bottom flanges **158** (FIG. 8) and **160**.

The rear strap **126** is identical to the front strap **124**, comprising legs **162** and **164**, top rail **166**, and bottom flanges **168** and **170**. It will be noted that the flanges of the straps **138** and **140** are positioned above the flanges of straps **124** and **126**. The flanges are preferably interconnected in the manner described above with reference to FIG. 4, so as to permit vertical adjustment of the frame from the supporting surface. For this purpose, supporting feet commonly designated at **172** are provided which extend upwardly through smooth openings formed in the flanges of the strap members **124** and **126** into threaded engagement with openings formed in the flanges of the strap members **138** and **140**, in the manner above described.

Stretcher members, generally indicated at **180** and **182** best shown in FIG. 7, are rigidly secured to and interconnect the strap members **138**, **140**, **124** and **126** to further rigidify the support frame. Each stretcher unit is generally shallow U-shaped, with stretcher **180**, for example, comprising side legs **184** and **186** and a connecting section **188**. Similarly, the stretcher **182** comprises side legs **190** and **192** and connecting section **194**. As shown, the connecting sections **188** and **194** of the stretcher are adapted to be contiguously disposed when the unit is assembled, and secured together by means of nut and bolt assemblies commonly designated at **196**,

with the connecting sections **188** and **194** being formed with aligned openings for receiving the same.

Each of the stretcher legs **184**, **186**, **190** and **192** has welded or otherwise secured thereto at its free end a generally L-shaped bracket commonly designated at **198**. Legs **200** and **202** of each bracket are adapted to lie contiguously and within the legs of the associated strap members. For example, looking at the lower righthand corner of FIG. 7, the leg **200** of the bracket **198** is contiguous the leg **130** of the strap **124**, and the leg **202** of the bracket is contiguous the leg **152** of the strap **140**. The legs of the bracket and the strap legs are formed with openings adapted to be aligned when the stretcher unit is properly positioned, and nut and bolt fasteners commonly designated at **204** are provided for securing the strap legs to the bracket. Preferably the openings formed in the strap legs **130** and **152** are countersunk so as to mount the heads of the bolts flush with the surface of the strap legs for enhancing esthetically the mounting arrangement. Alternatively, if desired, the bracket could be welded on site to the adjoining strap legs.

The legs of the stretcher units extend into the corners of the support frame below the horizontally directed rails **146** and **156** of the strap members **138** and **140**, respectively. The stretcher units **180** and **182** partially support the pedestals **122**, and discs are provided on the top of the stretchers at confluence of legs **184**, **190** and **192**, **186**. The top of the discs are coplanar with the top surfaces of the rails **146** and **156** so as to provide coplanar, horizontal surfaces for supporting the pedestals.

It will thus be seen that the support frame is rigidified by the provision of the stretcher members **180** and **182** which are secured to the strap members as described. To permit ease of assembly, the stretcher members are preferably constructed with the brackets **198** rigidly attached, for example by welding, to the stretcher legs. In this manner, the individual stretcher units **180** and **182** can be mounted at the site to the straps by means of the fastening assemblies **204** described, and the contiguous center portions **188** and **194** of the stretcher units thereafter bolted together. This construction is preferred since all fabrication is then accomplished at the manufacturing level, and the unit can be shipped knocked down and assembled at the site. If fabrication at the point of sale is of little concern, the stretcher could be formed into an integral unit at the manufacturing point, and the brackets **198** welded to the strap legs at the point of sale or installation. In either event, the stretcher assembly, when rigidly secured to the strap members, functions to rigidify the support frame to permit the supporting of increased loads.

The desk top shown in dashed lines in FIG. 6, can be, if desired, secured to the top rails **132** and **166** of the straps **124** and **126**, respectively, on which it is positioned. For example, if the top is wood, smooth or tapped openings could be formed in the rail **132** and **136** in a suitable location, and mounting bolts could be inserted therethrough into threaded engagement with tapped openings formed in desk top.

There is shown in FIG. 9 a further modification of a supporting frame adapted to support a desk having pedestals which are abbreviated front to rear, relative to pedestals **122** shown in the FIGS. 6–8 form. Where possible, structure that has been previously illustrated and described is designated in FIG. 9 by like reference numerals.

The strap generally indicated at **222**, comparable in certain respects with the straps **138** and **140** described above, includes a front vertical leg portion **224**, inturned lower flange **226**, horizontal leg portion **227**, a rear vertical leg **228** which extends vertically immediately behind the back wall of pedestal **220**, a top rail section **230** which extends horizontally directly beneath the top rail **166** of the strap **126**, and a vertical back rail **232** which terminates in flange **234** which is positioned above the flange **170** of the strap **126**. It will be understood that a similar strap **222** is provided at the opposite side of the system.

The leg portions **164** and **232** of the straps **126** and **222**, respectively, are disposed in normal, slightly spaced relation, in the same manner as above described in all the other forms of the invention. The stretcher members **180** and **182** are also provided in the FIG. 9 form, and can be constructed and mounted in the same manner as described above with reference to the FIGS. 6–8 form. The leg portions of the stretcher units, together with the bottom legs **227** of the strap thus support the pedestals **220**. In addition, the top rail **230** of the strap **222** is connected to the top rail **166** of the strap **126** in the same manner as the upper connection of the top rails of the straps in the FIGS. 1–5 form of the invention. Mounting screws (not shown) can if desired be provided for rigid attachment of the table top **242** to the support frame.

It will be noted that with respect both to the FIGS. 6–8 and FIG. 9 forms of the invention, the pedestals can be positioned in place on the straps and stretcher units, or can, if necessary, be additionally secured to one or both of these members. In either event, the pedestals are well supported by the rigidified support frame.

I claim:

1. A support system for furniture and the like, comprising at least four individual strap members generally rectangular in cross-section, each of said strap members being of generally inverted U-shape thereby to form pairs of generally vertical legs and integral, generally horizontal rail sections, each of said legs being formed on the bottom thereof with a laterally directed flange, each associated pair of said strap members being positioned relative to each other so that the rail sections of said members are perpendicular to each other with the adjacent corners in superimposed relation and the adjacent legs of such pair of such associated strap members are perpendicular to each other in generally vertical planes and spaced from each other uniformly throughout their length, with the flanges of an adjacently disposed pair of legs overlying each other, releasable means for rigidly interconnecting the superimposed corners of said rail sections, and releasable means for rigidly interconnecting said adjacently disposed flanges of said legs thereby to form a rigid support system.

2. The support system of claim **1** wherein said means for rigidly interconnecting said flanges comprises a supporting foot formed with a threaded shank portion extending upwardly through aligned openings formed in said flanges, said foot further including a relatively large circular head portion adapted to engage a supporting surface, and fastening means threadedly engaging said shank portion of said foot for tightly securing the members in assembled relation.

3. The support system of claim **1** wherein said means for rigidly interconnecting the superimposed corners of said rails comprises a plurality of connecting members each of which includes a circular head portion and a depending threaded shank adapted to extend through aligned openings formed in the superimposed rails, and fastening means threadedly engaging said shank portion for tightly securing the members in assembled relation.

4. The support system of claim **1** wherein each of said strap members is of generally the same height, and means for vertically spacing one of said members from the other at the interconnected regions thereof.

5. The support system of claim **1** wherein said means for rigidly interconnecting said rails includes means carried by said rails for vertical adjustable movement relative thereto thereby to vary the distance from the top surface of said rails to the article supported.

6. The support system of claim **1** wherein said means for interconnecting each pair of adjacently disposed flanges comprises a supporting foot member having an enlarged head adapted to engage a supporting surface, and a threaded shank, said lowermost flange being formed

with an opening for loosely receiving said shank, said uppermost flange being formed with a threaded opening for threaded engagement with said shank, whereby said foot can be vertically adjusted relative to said legs, and locking means for locking said foot in its vertically adjusted position.

7. The support system of claim **6** wherein said locking means comprises a lock nut threaded on said shank below said lowermost flange, and spacer means loosely disposed around said shank between said flanges for vertically spacing the same.

8. The support system of claim **1** wherein said means for interconnecting said rails comprises a connecting member having an enlarged head the outer flat surface of which is adapted to support a table top or the like, and a threaded shank, the uppermost rail being formed with an opening for loosely receiving said shank, the lowermost rail being formed with a threaded opening for threaded engagement with said shank, whereby said connecting member can be vertically adjusted relative to said rails, and locking means for locking said connecting member in its vertically adjusted position.

9. The support system of claim **8** wherein said locking means comprises a lock nut threaded on said shank above said top rail and below said head, and spaced means loosely disposed around said shank between said rails for vertically spacing the same.

10. A support for furniture and the like, comprising at least four individual strap members generally rectangular in cross-section, each of said strap members being of generally inverted U-shape thereby to form pairs of generally vertical legs and integral, generally horizontal rail sections, each of said legs being formed on the bottom thereof with a laterally directed flange, each associated pair of said strap members being positioned relative to each other so that the rail sections of said members are perpendicular to each other and the adjacent legs of such pair of such associated strap members are perpendicular to each other in generally vertical planes and spaced from each other uniformly throughout their length, with the flanges of an adjacently disposed pair of legs overlying each other, rigidifying means interconnecting adjacently disposed legs thereby to reinforce the support system, at least one of said strap members including a relatively short vertical leg portion lying generally in the same plane as said rigidifying means, and releasable means for rigidly interconnecting said adjacently disposed flanges of said legs.

11. The system of claim **10** wherein said means for rigidly interconnecting each adjacently disposed pair of legs includes vertically adjustable supporting legs operatively connected to said legs for vertically adjusting the system relative to the supporting surface.

12. The system of claim **10** wherein two of said strap members extend transversely of said support system and each includes relatively short vertical leg portions and an interconnecting rail portion which lies in generally the same horizontal plane as said stretcher members thereby providing therewith a supporting surface for the pedestals of a desk or the like.

13. The system of claim **10** wherein two of said straps extend transversely of said system, each of said transversely extending straps including a front, relatively short vertical leg portion, a horizontal rail section extending rearwardly generally in the same horizontal plane as said stretcher members thereby to form therewith a supporting surface for the pedestal of a desk or the like, a second vertically extending section adapted to extend closely behind said pedestal, a second horizontal section lying approximately in the plane of the rail of the other of said strap members, and a third vertical section forming the back leg of said strap member.

14. The system of claim **10** wherein said rigidifying means comprises stretcher means interconnecting a plurality of pairs of adjacently disposed legs.

15. A support for furniture and the like, comprising at least four individual strap members generally rectangular in cross-section, each of said strap members being of generally inverted U-shape thereby to form pairs of generally vertical legs and integral, generally horizontal rail sections, each of said legs being formed on the bottom thereof with a laterally directed flange, each associated pair of said strap members being positioned relative to each other so that the rail sections of said members are perpendicular to each other with the adjacent corners in superimposed relation and the adjacent legs of such pair of such associated strap member are perpendicular to each other in generally vertical planes and spaced from each other uniformly throughout their length, with the flanges of an adjacently disposed pair of legs overlying each other, means for rigidly interconnecting the superimposed corners of said rail sections, and means for rigidly interconnecting said adjacently disposed flanges of said legs thereby to form a rigid support system.

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U.S. Cl. X.R.

248—188.4