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(54) **DISPLAY RACK**

Publication Classification

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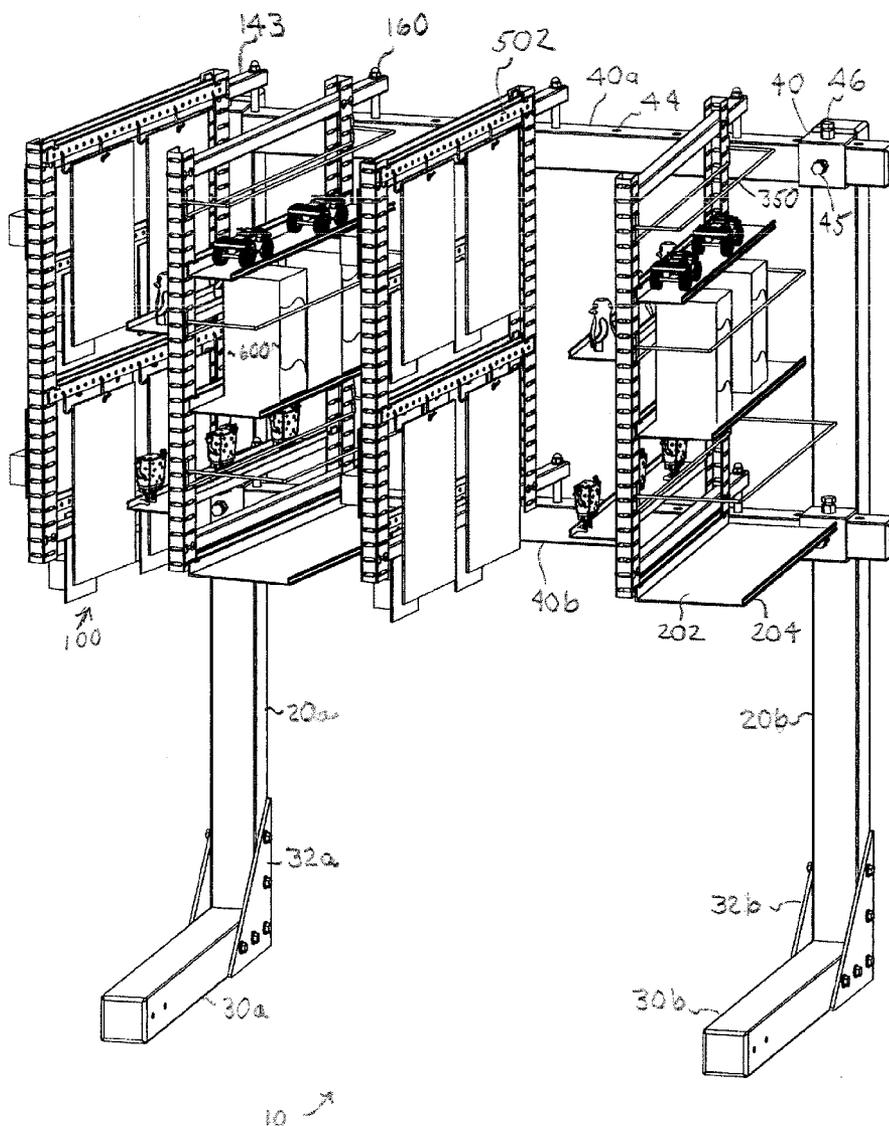
(57) **ABSTRACT**

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A display rack system includes a main frame with a selectable number of swingable display frames releasably attached thereto. Each display frame includes vertical mounting arms with a plurality of slots therealong. Item support assemblies releasably engage these mounting arms, on each side thereof, so as to releasably attach item support assemblies, e.g., shelves, hooks and clamps, thereto. Wire supports are further releasably attached to the arms to restrain item movement during swinging movement of the display frames. The main frame can either be basally supported or attached to a vertical surface.

(21) Appl. No.: **11/861,677**

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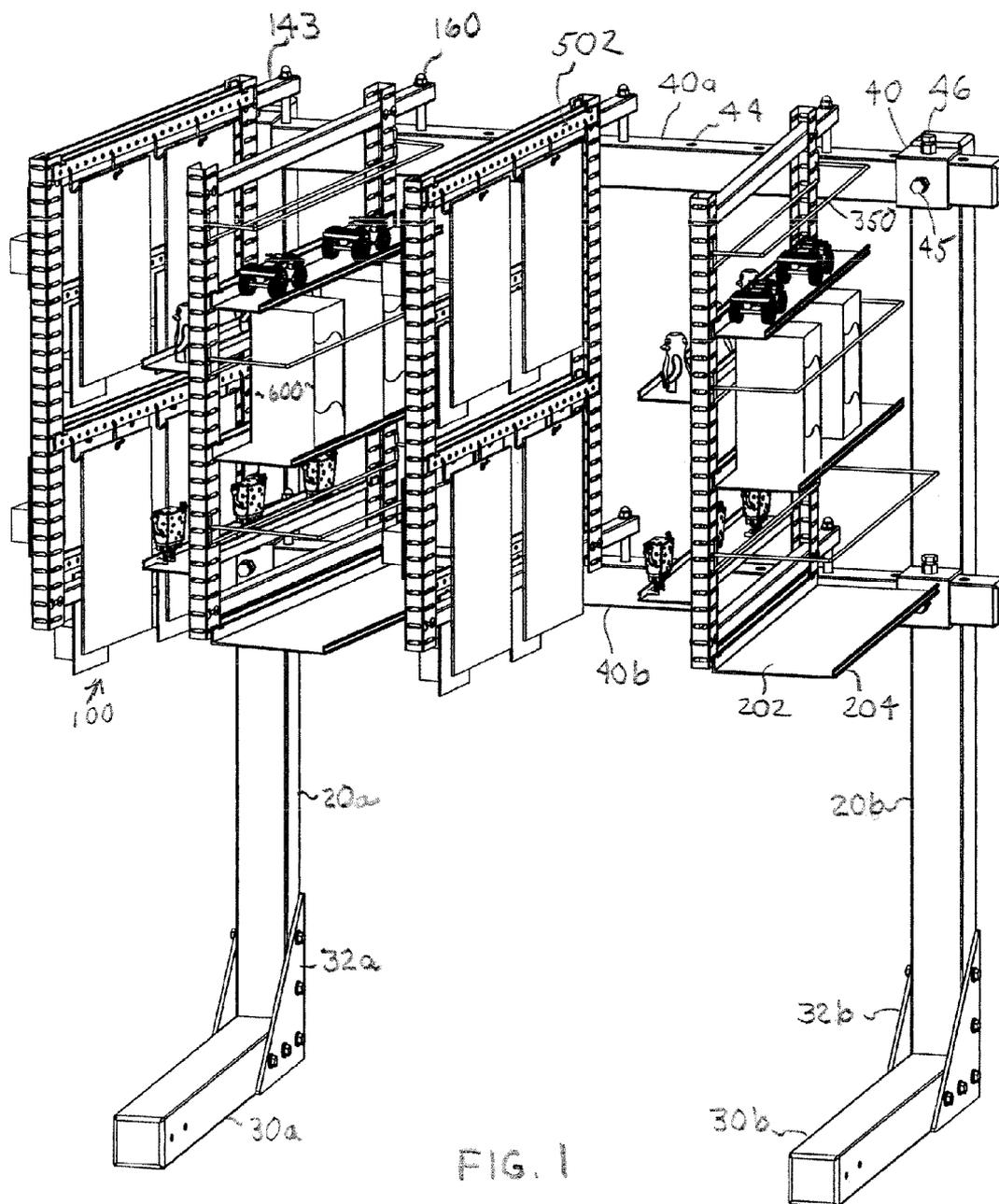
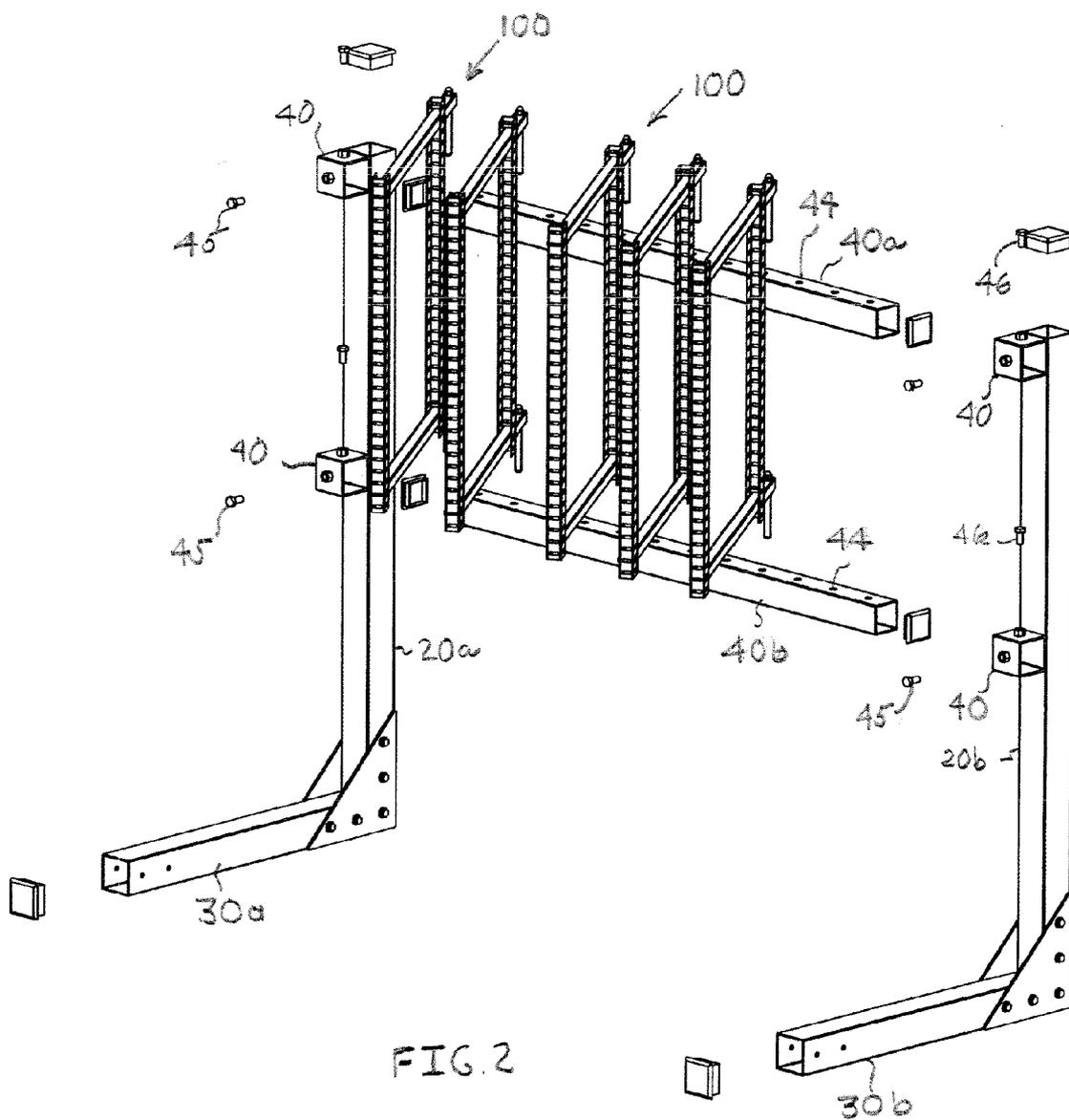


FIG. 1

10 →



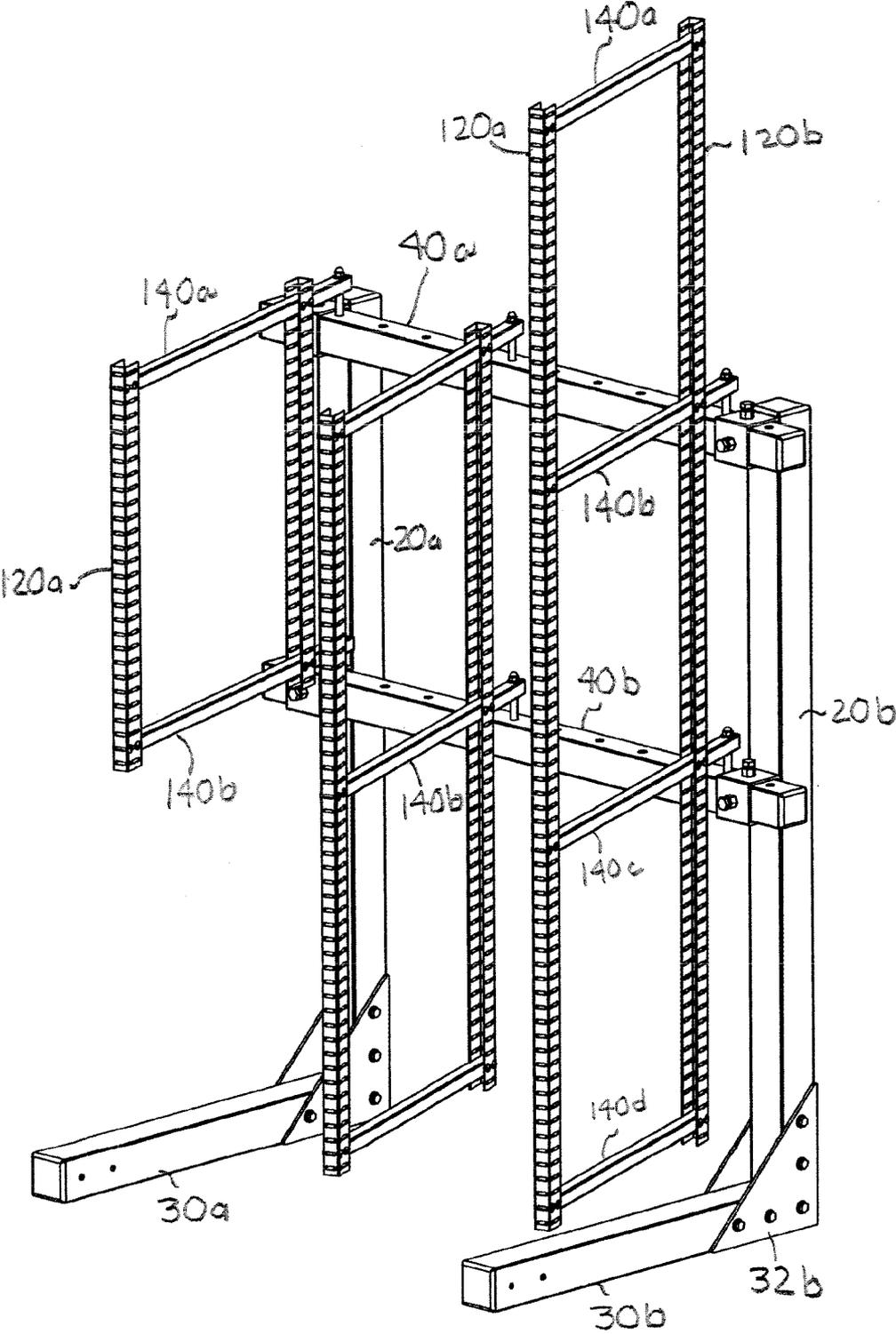


FIG. 3

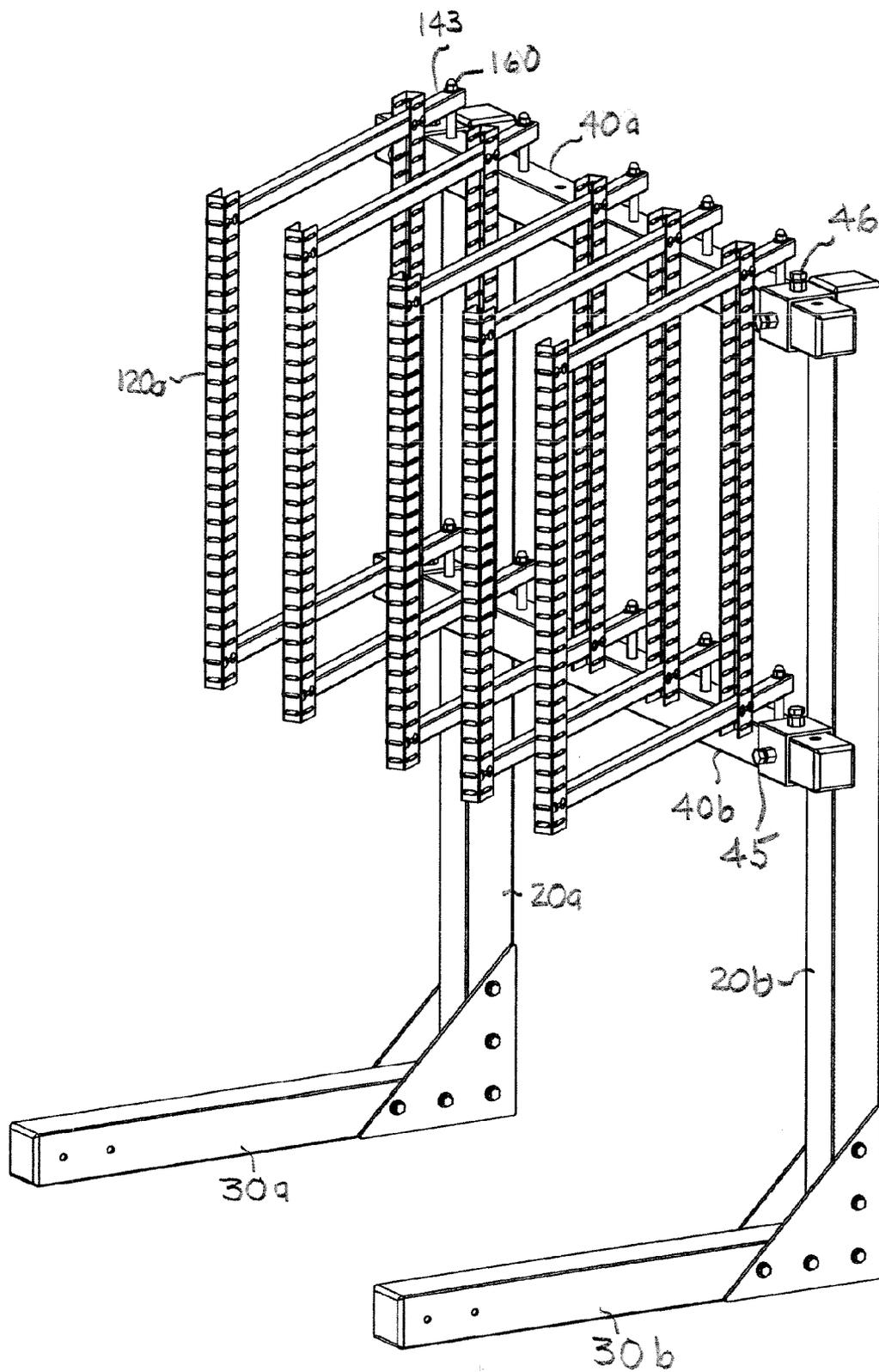


FIG. 4

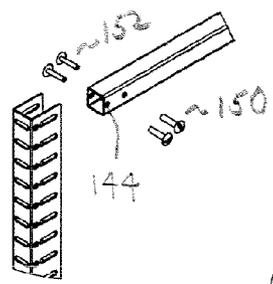


FIG. 6

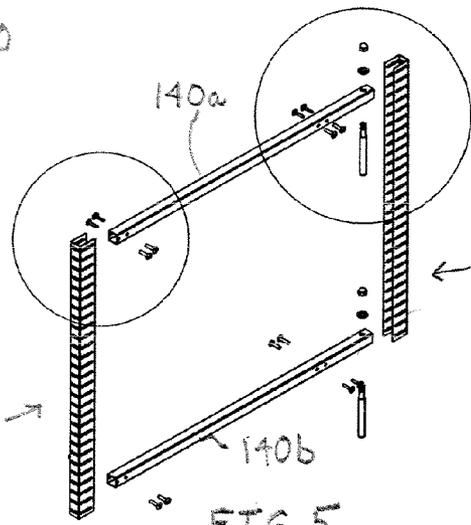


FIG. 5

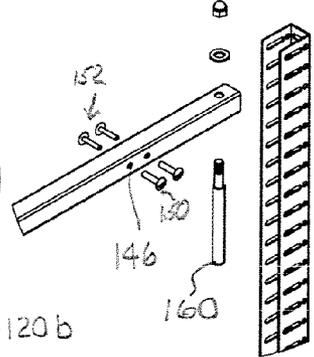


FIG. 7

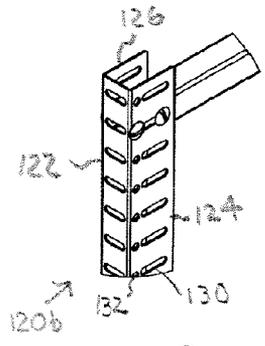


FIG. 9

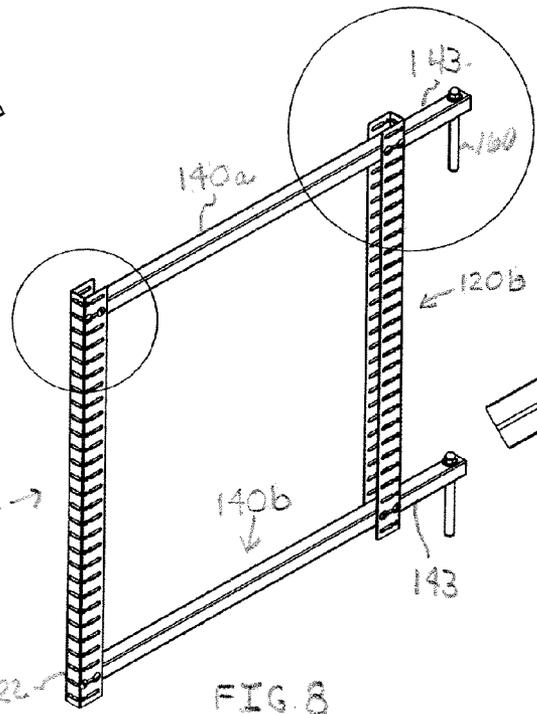


FIG. 8

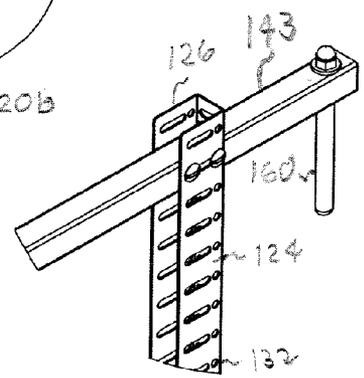


FIG. 10

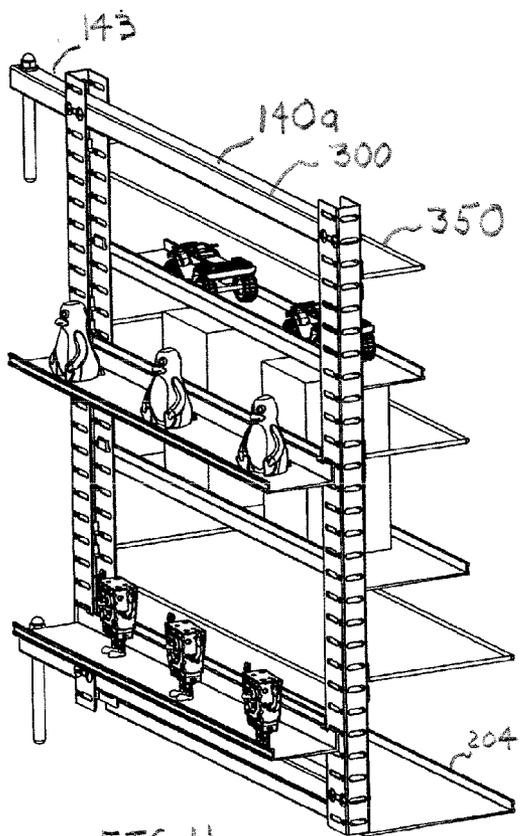


FIG. 11

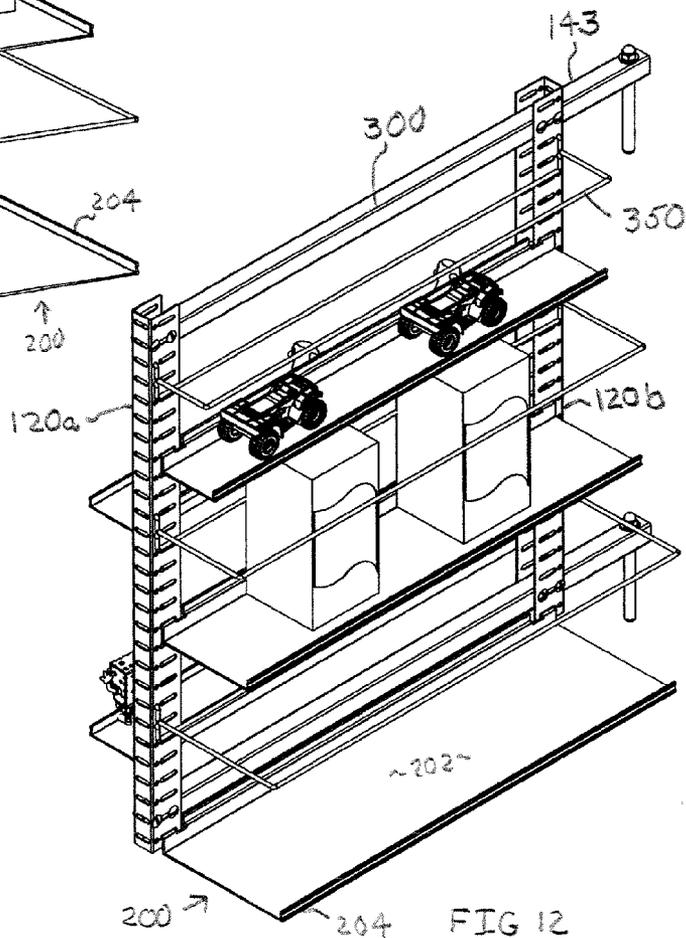


FIG. 12

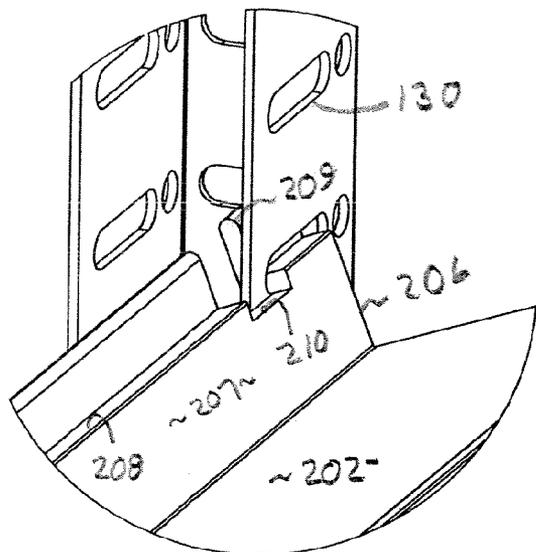


FIG. 14

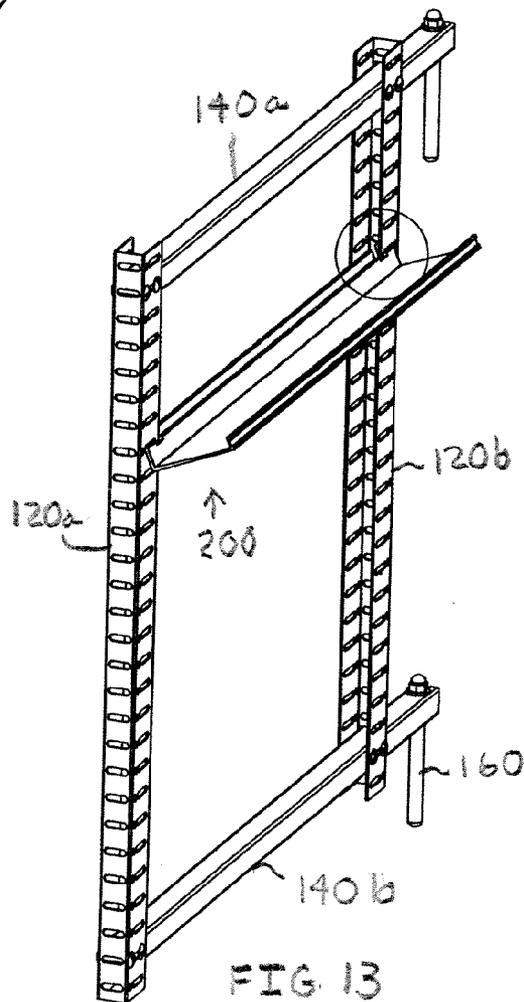


FIG. 13

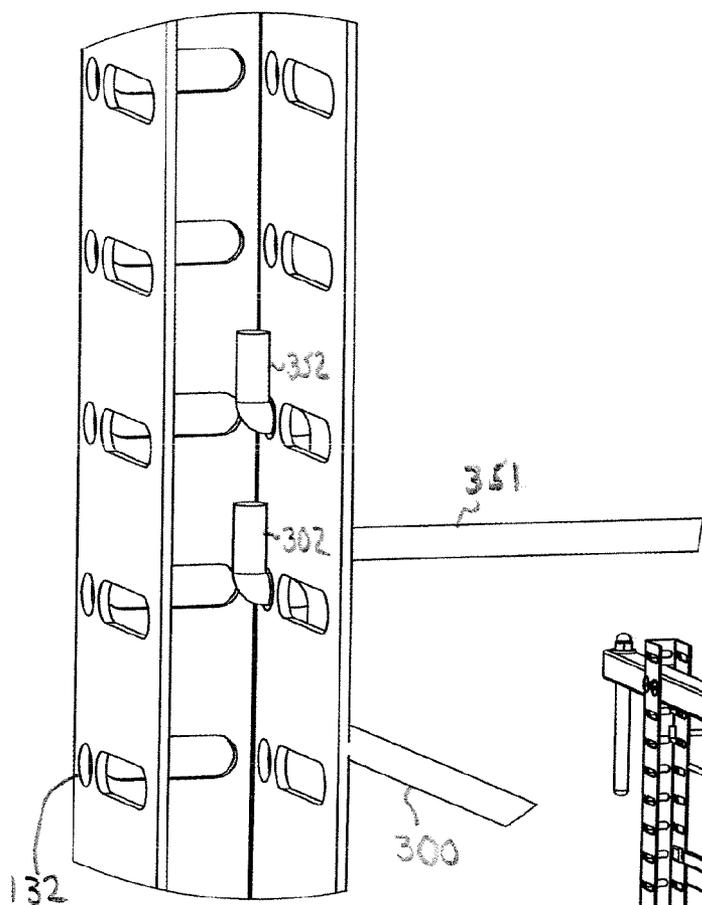


FIG. 16

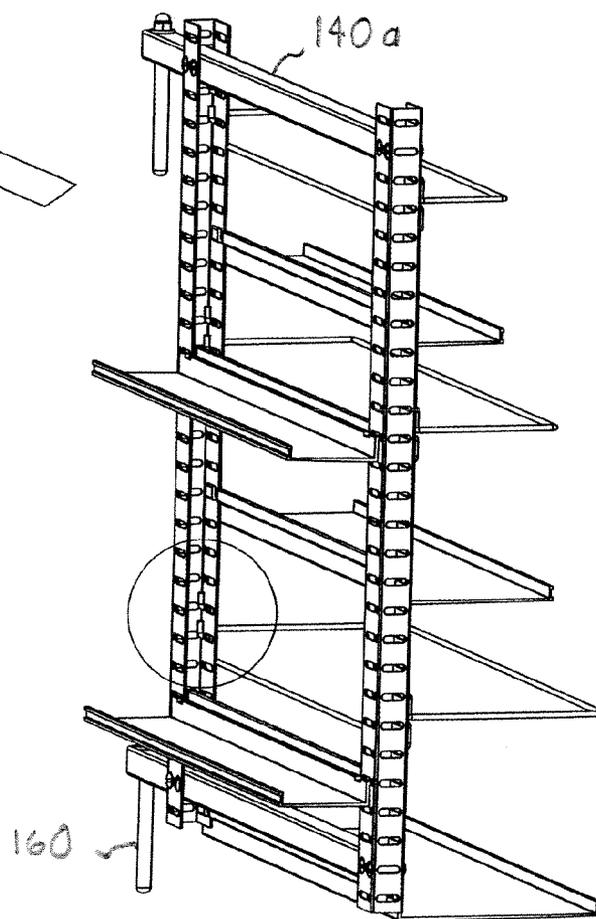


FIG. 15

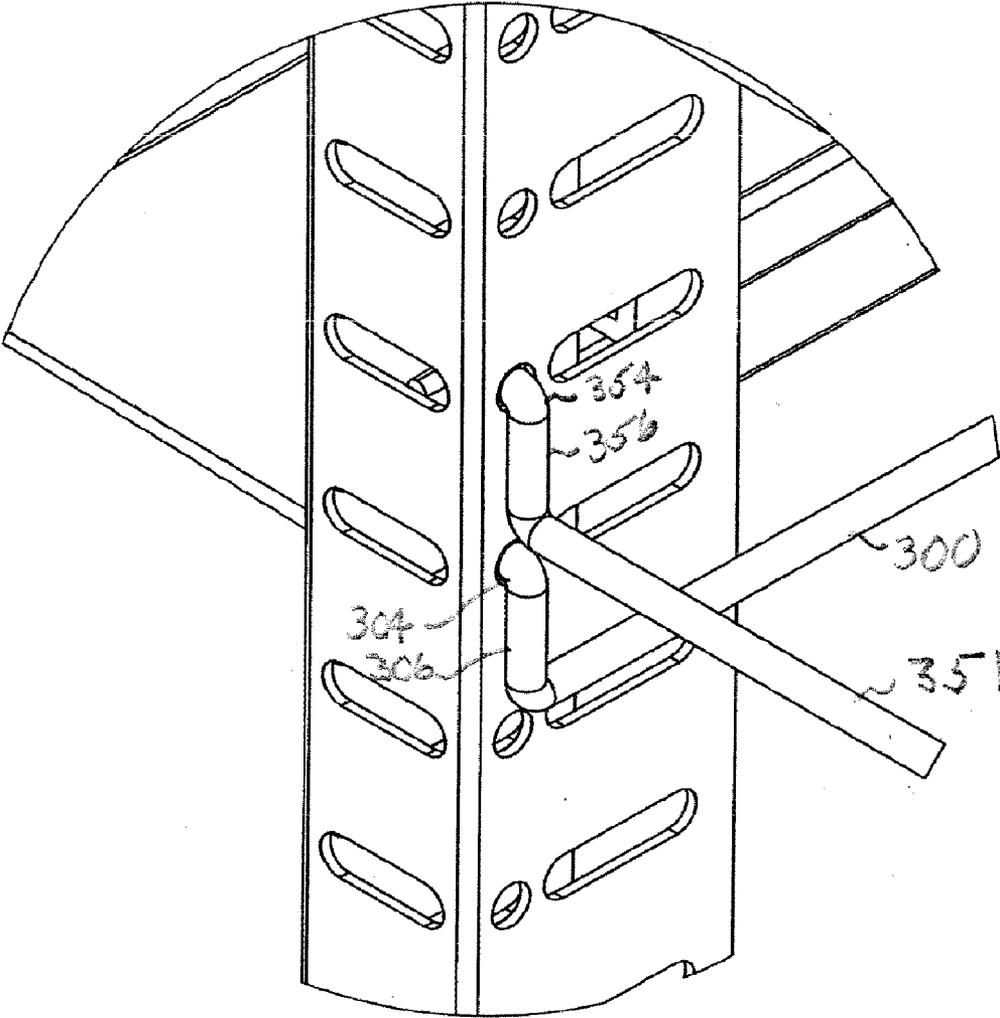


FIG. 17

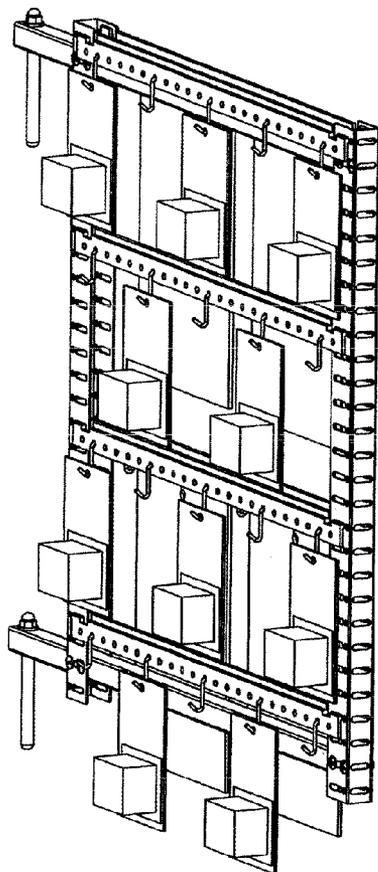


FIG. 19

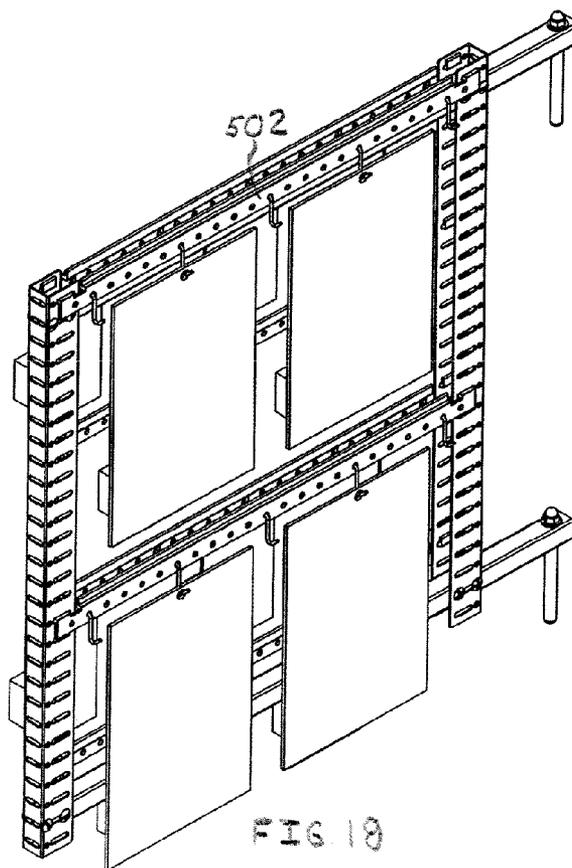


FIG. 18

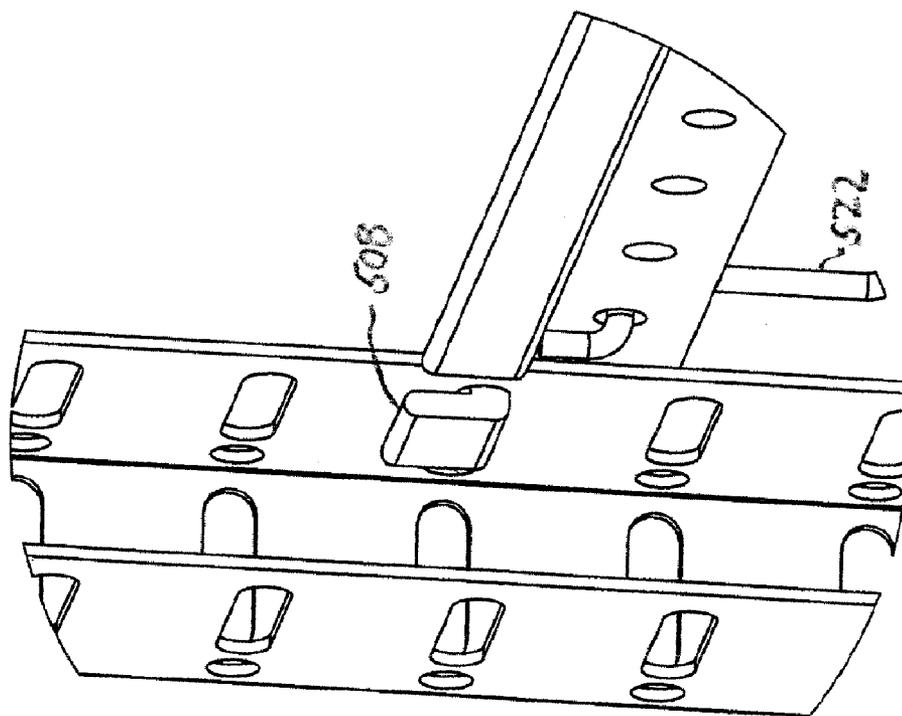


FIG. 20

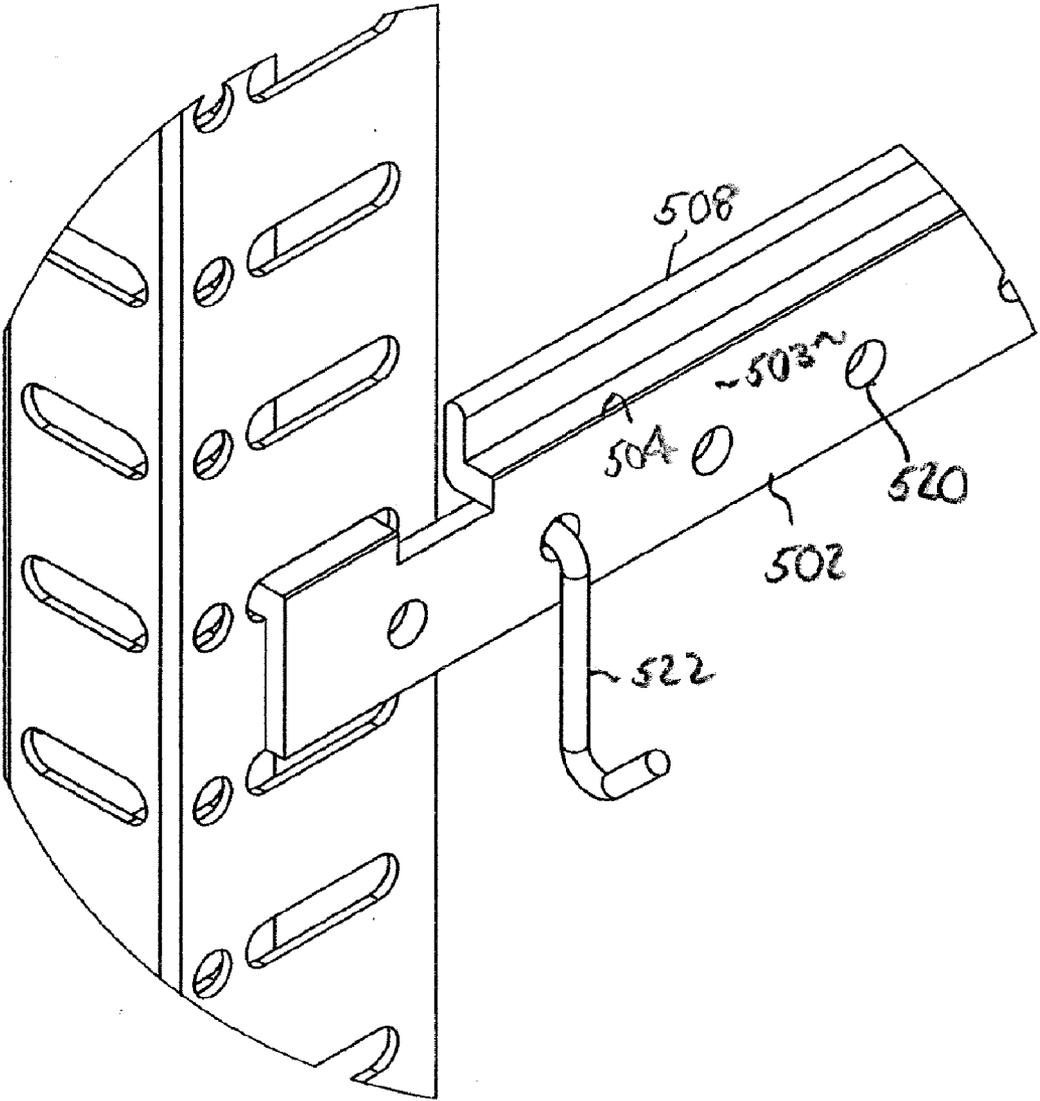


FIG. 21

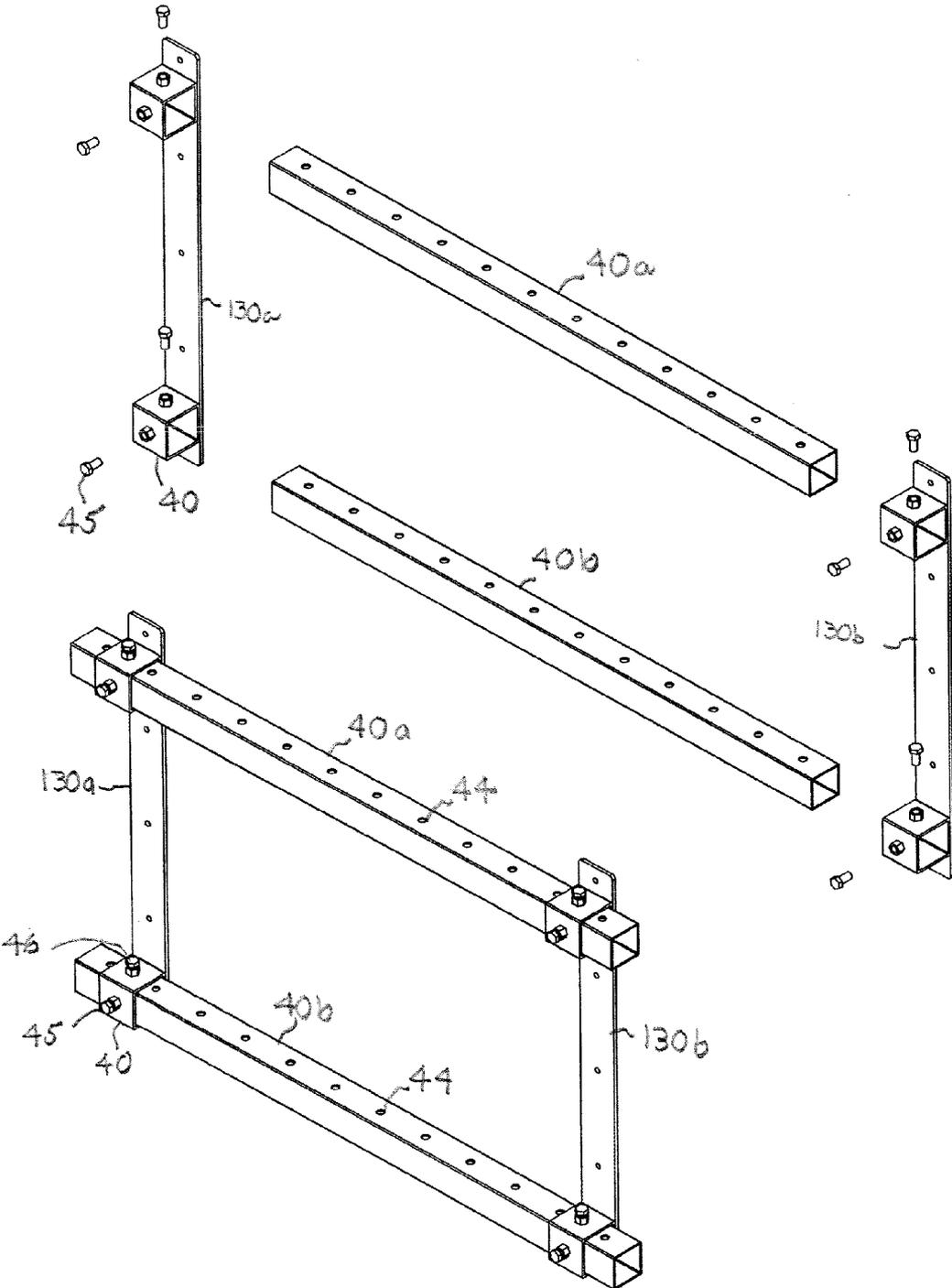


FIG 22

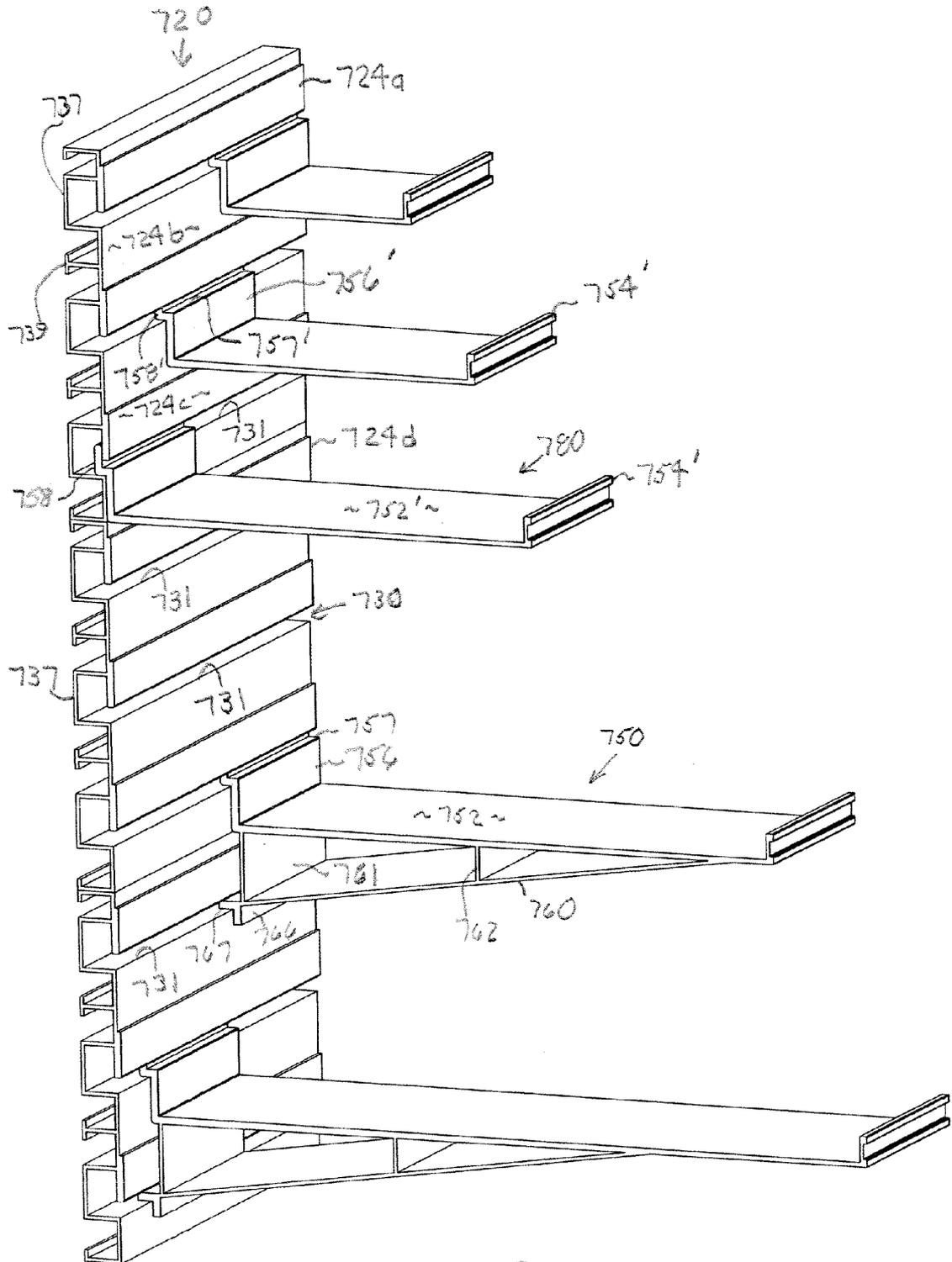
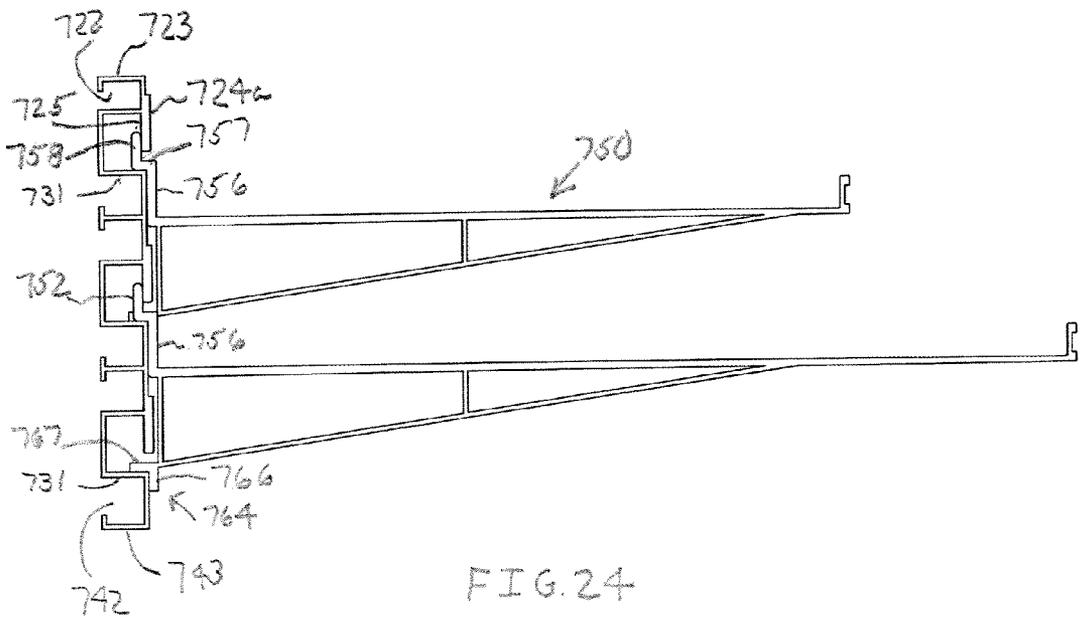
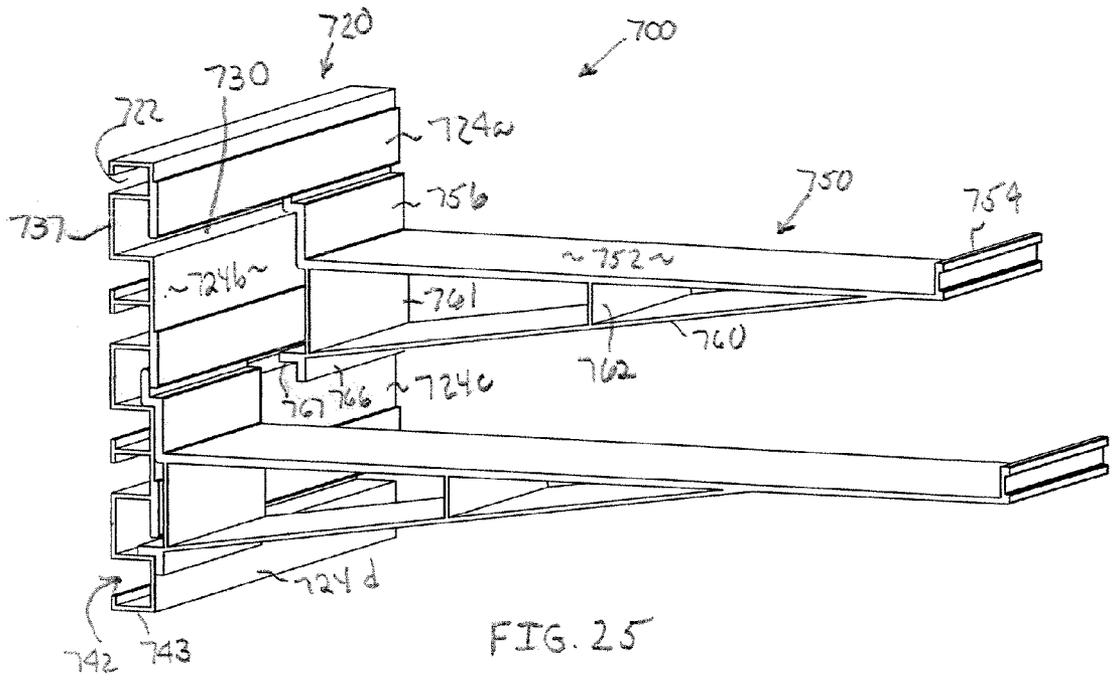


FIG. 23



DISPLAY RACK

BACKGROUND OF THE INVENTION

[0001] This invention is directed to a display rack and, more particularly, a rack system having a plurality of swingable, releasable display frames thereon, each frame adapted to receive various item support assemblies releasably attached thereto.

[0002] The use of display racks in commercial environments is known. However, past display racks have been restricted in use particularly if they were dedicated to a specific product.

[0003] Past display racks have not been suitable to display items having various quantities, sizes and configuration. As such, not all of a retailer's inventory could be displayed on one rack. Moreover, as a collector's inventory of items increased, home display became more difficult which, in some cases, relegated the collected items to storage rather than display. Thus, there is a need to have a display rack system which is capable of displaying different items and be easily, variably sized according to the quantity desired to be displayed.

SUMMARY OF THE INVENTION

[0004] In response thereto I have invented a display rack system which includes a main frame for supporting a plurality of releasable display frames in swingable movement relative thereto. Each display frame is capable of having various item support assemblies releasably attached thereto. Each support assembly is designed to hold in position various items for display whether in the form of basal support or suspension from the display frame. Each display frame is releasably engageable to the main frame which allows a variable number of display frames to be utilized. The combination of selectable display frames and support assemblies allows the quantity, size and type of items to be displayed to be varied.

[0005] It is therefor a general object of this invention to provide a display rack system which can display various quantities of items.

[0006] Another object of this invention is to provide a display rack, as aforesaid, which can display items of various designs and configurations.

[0007] A further object of this invention is to provide a display rack, as aforesaid, having a plurality of display frames swingably and releasably attached to a main frame.

[0008] Another object of this invention is to provide a display rack, as aforesaid, having a selectable number of item support assemblies releasably attached to the display frames.

[0009] A further object of this invention is to provide a display rack, as aforesaid, with each display frame capable of either basally supporting or suspending a display item.

[0010] Another particular object of this invention is to provide a display rack, as aforesaid, adaptable for use on either a horizontal or vertical surface.

[0011] Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings, wherein is set forth by way of illustration and example, now preferred embodiments of this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view of the display rack system having a plurality of display frames mounted thereto and various support assemblies releasably mounted to the display frames;

[0013] FIG. 2 is an exploded view of the ground support main frame and display frames attached therefrom;

[0014] FIG. 3 is a perspective view of a display rack system with display frames of various sizes mounted thereto;

[0015] FIG. 4 is a perspective view of a display rack having a plurality of display frames of equal size thereon;

[0016] FIG. 5 is an exploded view of a display frame;

[0017] FIG. 6 is an enlarged, exploded view of one end of a strut/mounting bar connection of the display frame of FIG. 5;

[0018] FIG. 7 is an enlarged, exploded view of an opposed end of the strut/mounting bar connection of the display frame of FIG. 5;

[0019] FIG. 8 is an enlarged, assembled view of the FIG. 5 display frame;

[0020] FIG. 9 is an enlarged view of one end of a strut/mounting bar connection of the FIG. 8 display frame;

[0021] FIG. 10 is an enlarged view of an opposed end of the strut/mounting bar connection of the FIG. 8 display frame;

[0022] FIG. 11 is a view of one side of a display frame showing shelf and wire support assemblies thereon;

[0023] FIG. 12 is an opposed side view of the display frame of FIG. 11;

[0024] FIG. 13 is a view of a display frame showing a shelf assembly initially inserted into the mounting bar apertures;

[0025] FIG. 14 is an enlarged, fragmentary view showing the means of attachment of the shelf in FIG. 13 to the display frame;

[0026] FIG. 15 is a view of a display frame and wire support members attached thereto;

[0027] FIG. 16 is an enlarged, fragmentary view from within a mounting bar showing the manner of attachment of the wire support members of the FIG. 15 display frame;

[0028] FIG. 17 is an enlarged, fragmentary view of FIG. 16 from the exterior of the mounting bar;

[0029] FIG. 18 is an opposed view of a display frame showing an item support assembly suspending items therefrom attached to a display frame;

[0030] FIG. 19 is an opposed view of the display frame of FIG. 18;

[0031] FIG. 20 is an enlarged, fragmentary view showing the manner of attachment of the suspension rail of the FIG. 18 suspension assembly to the mounting arm of a display frame with a fragmentary hook suspended therefrom;

[0032] FIG. 21 is a fragmentary view of the suspension rail of FIG. 20 from the opposed side thereof;

[0033] FIG. 22 is a view of an alternative embodiment of the main frame for attachment to a vertical surface;

[0034] FIG. 23 is a perspective view of an alternative embodiment of a display rack system;

[0035] FIG. 24 is a side view of the embodiment of FIG. 23; and

[0036] FIG. 25 is a perspective view of the FIG. 23 embodiment utilizing alternative shelves.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0037] Turning more particularly to the drawings, FIG. 1 shows my display rack system 10 in a floor display mode. My rack system generally comprises a main support frame which includes first and second columnar supports 20a and 20b. Each column 20a, 20b includes floor supports 30a, 30b attached to the columns 20a, 20b at the lower ends thereof by flanges 32a, 32b bolted thereto.

[0038] As best shown in FIG. 2, the main frame includes first and second horizontal struts **40a**, **40b** extending between support members **20a**, **20b**. These struts **40a**, **40b** are attached thereto by bracket **40**/bolt combination. One bolt **46** extends through a selected aperture **44** of the plurality of apertures in the horizontal struts **40a**, **40b** and aperture in bracket **40**. A second bolt **45** extends through an aperture in the front wall of the bracket **40** and bears against the front wall of each strut **40a**, **40b** so as to maintain these struts in place.

[0039] Swingably attached to the main frame are a plurality of display frames **100**. As best shown in FIGS. 5-10, each display frame **100** includes first and second upright mounting bars **120a**, **120b** with each bar having an end wall **122** and side walls **124**, **126**. Each wall **122**, **124**, **126** has a plurality of slots **130** therealong. Apertures **132** are further positioned in the side walls **124**, **126** adjacent each slot.

[0040] Struts **140a**, **140b** extend between the mounting bars **120a**, **120b**. Each strut includes apertures **144**, **146** at the opposed ends thereof. Apertures **144** at one end of each strut **140a**, **140b** align with the apertures **132** and slot **130** in the side walls **124**, **126** of mounting bar **120a**. Nestable fasteners **150**, **152** extend through these aligned side wall and strut apertures so as to attach one end of the strut **140** to mounting bar **120a**.

[0041] The opposed ends of each strut **140a**, **140b** extend through enlarged apertures in arm **120b** so as to provide an extension **143** of each strut **140a**, **140b** beyond the arm **120b**. These extensions **143** present a pivot arm **143**. Attached to this arm **143** at the free end thereof are pivot pins **160**. Fasteners **150**, **152** likewise extend through the apertures **146** in the side walls **120a**, **120b**, as aligned with slot **130** and apertures **132** in the mounting arm **120b**.

[0042] The pivot pins **160** nest in the apertures **44** found along struts **40a**, **40b**. Thus, a plurality of display frames can be swingably, releasably attached to the main support frame. These display frames **100** can be of selectable quantities and various sizes with each frame offering mounting bars **120a**, **120b** of various lengths (FIG. 3). It is understood that as the frame size increases additional reinforcing struts, e.g., **140c**, **140d**, may be required.

[0043] The mounting bars **120a**, **120b** with slots **130** and apertures **132** therein allow various types of support assemblies to be releasably attached to the display frames **100** so that various items can be basally supported by or suspended from each display frame **100**.

[0044] FIGS. 11-12 show a display frame with a plurality of shelves **200** thereon. Each shelf **200** includes a base **202** having a retaining flange **204** and a mounting flange **206** (FIG. 14). The mounting flange **206** presents a wall **207** normally extending from base **202**, a wall **208** normally extending from wall **207**, a vertical tab **209** normally extending from wall **208** and a notch **210** adjacent each tab **209**. Tabs **209** are first inserted into a selected slot **130** in each mounting bar **120a**, **120b** (FIG. 14). Upon clockwise rotation locking occurs as wall **208** rests on the bottom edge of slot **130** with tab **209** and wall **208** bearing against the opposed surfaces of the adjacent side walls of each mounting bar **120a**, **120b** so as to maintain the shelf **200** in place. Notch **210** allows mounting bar clearance for this initial penetration and rotation. As such the shelves **200** may selectively engage the slots **130** along the vertical extent of the mounting bars **120a**, **120b** in opposed side walls **124**, **126** of the mounting bars **120a**, **120b**. Such structures allow various item types to be supported as shown in FIG. 1 by each frame on both sides thereof.

[0045] Further releasably attached to display frames **100** are wire support assemblies consisting of first and/or second wire members **300**, **350** (FIGS. 15-17). Wire members **300**, **350** are designed to engage apertures **132** in the mounting bar side walls. As shown in FIGS. 16 and 17, each wire member **300**, **352** includes at both ends a first section **306**, **356** normally extending from each wire **300**, **350**, a second section **304**, **354** normally extending from sections **306**, **356**, and free sections **302**, **352** normally extending from sections **304**, **354**. Free ends **302**, **352** are first insertable through apertures **132** and upon clockwise rotation bear against the interior surface of the side wall of each arm **120a**, **120b**. Once seated, the wire member section **304**, **354** rests on the bottom of the aperture **132** with sections **306**, **356** bearing against the opposed surface of side wall. Thus, locking occurs.

[0046] Upon locking, the first wire member **300** spans the mounting bars **120a**, **120b**. The second wire member includes sections **351** extending away from each mounting bar **120a**, **120b** so as to displace wire **350** from the first wire **300**. As such, items such as boxes **600**, dolls, etc. may be placed on a shelf **200** and between the displaced wire members **300**, **350**. These wires **300**, **350** provide side restraints so as to restrict item movement on the shelf during swingable movement of the frame **100**.

[0047] Another support assembly **500** suspends items from each frame **100**. As such, a suspension rail **502** is provided having a mounting flange along the extent thereof. The mounting flange includes a shelf **504** normally extending from the front wall of rail **502** with tab **508** normally extending from shelf **504**. Each tab **508** is insertable into a slot **130** in a respective mounting bar and rotated into place such that tab **508** bears against an inside surface of an arm sidewall with the shelf **504** resting on the bottom of slot **130**. The rail **500** has a plurality of apertures **520** so that various suspension elements can be engaged therewith, such as hooks **522** shown. It is understood that other suspension elements may be associated with the rail **500** such as clamps, wires, etc. Thus, various types of items (FIGS. 18-19) can be suspended from a display frame **100**.

[0048] FIG. 22 shows an alternate form of the main support frame wherein the vertical column members **30a**, **30b** are replaced with flat bar members **130a**, **130b** which can be attached to a vertical surface such as a wall. The above-described horizontal struts **40a**, **40b** can then be attached between these bars **130a**, **130b** via the above-described brackets **42**. The display frames **100** can then be swingably mounted to these horizontal struts **40a**, **40b** and utilized as above described. Thus, the main frame of the display rack can either be basally supported or attached to another surface.

[0049] Accordingly, it can be seen that my display rack utilizing the releasably engageable display frames **100** and various support assemblies **200**, **300**, **500** is adaptable to various environments and enables the user to display various types of items and quantities thereon.

[0050] FIGS. 23-25 show another embodiment of a display rack **700**. This embodiment generally comprises an upright support wall **720** with shelves **750**, **780** attached thereto.

[0051] The shelf support wall **720** comprises a series of channels including a top channel **722** with top wall **723** and a bottom channel **742** with bottom wall **743**. A series of front walls **724a**, **724b**, **724c**, **724d**, etc. with slots **730** therebetween can be presented. Each slot **730** presents access to a horizontal wall **731** of a lower front wall and the opposed interior surface **725** of a higher front wall. Each slot **730** also

presents access to a back wall 737 of a channel. As such, screws may be driven through a back wall 737 and into a wall stud so as to hold the support wall 720 in place. Located in the channel between slots are reinforcing members 739 designed to bear against a wall and offer rigidity to the support wall 720.

[0052] Shelf 750 includes a base 752 with retaining flange 754 at one end. At the opposed end of base 752 is a mounting structure presented by end wall 756 normal to base 752. A wall 757 is normal to end wall 756 and presents an upright wall 758 or lip normally extending therefrom.

[0053] Underneath the base 752 is reinforcing structure in the form of a wall 760 having reinforcing flanges 761, 762 therebetween. A second mounting structure at the end of wall 760 includes a depending wall 766 with a lip 767 normally extending therefrom.

[0054] In use the lip 758 is inserted into a slot 730 and rotated counterclockwise such that lip 758 bears against an inside surface 725 of a wall 724 with wall 757 resting atop a horizontal surface 731 presented by slot 730. Concurrently, the lower mounting flange 764 engages a lower slot 730 as lip 767 is inserted therein such that the lip 767 rests atop a lower horizontal surface with depending wall 766 bearing against a surface of a lower front wall 724. Accordingly, engagement of these upper and lower mounting flanges with upper and lower slots 730 maintains the shelf 750 in place.

[0055] Shelf 780 is similar in construction to shelf 750 except for the absence of the underlying reinforcing structure. As such, shelf 780 presents similar mounting structure in the form of an end wall 756', wall 757' and lip 758'. Upon insertion of wall 758' into slot 730 and rotation, the wall 758' bears against the inside surface 725 of an upper wall, wall 757' resting atop an adjacent horizontal surface 731 and wall 758' against a lower front wall 724. As such, the shelf 780 is held in place.

[0056] It is to be understood that while certain forms of this invention have been illustrated and described, it is not limited thereto, except in so far as such limitations are included in the following claims and allowable equivalents thereof.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

- 1. A display rack for items comprising:
 - a support frame including at least one strut;
 - a plurality of apertures along said at least one strut;
 - at least one display frame, said at least one display frame comprising:
 - at least one upright mounting arm presenting a plurality of apertures positioned therealong;
 - a pivot arm associated with said at least one upright arm;
 - a pivot pin extending from said arm, said pin nestable in an aperture along said at least one support frame strut to provide swingable movement to said at least one display frame;
 - means for supporting an item in swingable movement with said at least one display frame, said support means engageable with an aperture along said at least one mounting arm.
- 2. The display rack as claimed in claim 1 wherein said support means comprises:
 - at least one shelf;
 - means on said at least one shelf for releasable engagement with said one aperture along said at least one arm, said engagement positioning said at least one shelf in a selectable position on said display frame.

- 3. The display rack as claimed in claim 2 wherein said support means further comprises:
 - a first wire member;
 - means for engaging said first wire member with an arm aperture above said shelf, said first wire member restraining movement of an item placed on said at least one shelf during said swingable movement of said display frame.
- 4. The display rack as claimed in claim 3 wherein said support means further comprises:
 - a second wire member;
 - means for engaging said second wire member with an arm aperture above, said second wire member restraining movement of an item placed on said shelf during said swingable movement of said display frame.
- 5. The display rack as claimed in claim 1 wherein said support means comprises:
 - a rail;
 - means for engaging said rail to said at least one arm;
 - means suspended from said rail for attachment to an item, whereby to suspend the item from said rail in swingable movement with said display frame.
- 6. The display rack as claimed in claim 5 wherein said support means further comprises a plurality of apertures along said rail, said attachment means engageable with said rail apertures, and in suspension from said rail.
- 7. The display rack as claimed in claim 1 further comprising means for maintaining said support frame on a floor surface.
- 8. The display rack as claimed in claim 1 further comprising means for maintaining said support frame on a vertical surface.
- 9. A display rack for items comprising:
 - a support frame including at least one generally horizontal strut;
 - a plurality of apertures along said strut;
 - at least one display frame for mounting to said at least one strut comprising:
 - a pair of spaced-apart, generally upright arms mounted to said at least one strut, each arm presenting a plurality of apertures therealong;
 - at least one brace extending between said arms;
 - a pivot arm extending from at least one of said arms;
 - pivot means on said pivot arm, said pivot means engageable with a selected aperture along said at least one horizontal strut to provide swingable movement to said at least one display frame;
 - means engageable with said apertures along said upright arms for supporting items in swingable movement with said at least one display frame at a selectable position on said display frame.
- 10. The display rack as claimed in claim 9 wherein said item support means comprises:
 - a shelf;
 - means on said shelf for releasable engagement with an aperture in each of said arms, said engagement positioning said shelf in a selectable position along said at least one display frame.
- 11. The display rack as claimed in claim 10 wherein said apertures are presented along said arms on opposed sides thereof whereby to position said shelf on each side of said at least one display frame.
- 12. The display rack as claimed in claim 10 further comprising:

a first wire member;
 means for engaging said first wire member with an aperture in each of said arms above said shelf, said engaged first wire extending between said arms for providing a restraint to an item placed on said shelf.

13. The display rack as claimed in claim **12** further comprising:

a second wire member;
 means for engaging said second wire member with an aperture in each of said arms above said shelf, said engaged second wire member displaced away from said first wire and extending between said arms, said second wire members restraining movement of an item placed on said shelf.

14. The display rack as claimed in claim **9** wherein said support means further comprises:

a rail extending between said arms;
 means suspended from said rail for attachment to a selected item, whereby to suspend the attached item from said rail.

15. The display rack as claimed in claim **14** wherein said support means further comprises means for attaching said rail with an aperture in each of said arms.

16. The display rack as claimed in claim **10** wherein said shelf engagement means comprises a pair of tabs extending from opposed ends of said shelf, said respective tabs engageable with said arm apertures for said releasable engagement.

17. A display rack for items comprising:
 a support frame including structure presenting a plurality of apertures extending along a lateral extent of said frame;

at least one display frame, said at least one display frame comprising:

at least one upright mounting bar presenting a plurality of apertures therealong;
 pivot means on said display frame for engagement with one of said apertures of said support frame whereby to selectably position said at least one display frame along a lateral extent of said support frame;

means engageable with a selected aperture of said mounting bar apertures of said at least one mounting bar for supporting items in swingable movement with said display frame.

18. The display rack as claimed in claim **17** wherein said support means comprises:

a shelf;
 means on said shelf for releasable engagement with said selected aperture of said at least one mounting bar whereby to position said shelf in a selectable position along said mounting bar.

19. The display rack as claimed in claim **18** further comprising:

first and second wire members;
 means for engaging said first and second wire members to said at least one bar in spaced-apart extension above said shelf, said first and second wire members providing a restraint for an item placed on said shelf.

20. The display rack as claimed in claim **17** wherein said support means further comprises:

a rail attached to said at least one bar;
 a plurality of apertures along said rail;
 means engageable with a rail aperture, said means including structure for attachment to a selected item, whereby to suspend the item from said rail.

21. A display rack comprising:

a support frame comprising:
 a series of spaced-apart generally vertical walls, each wall presenting exterior and interior vertical surfaces;
 a slot between adjacent spaced-apart vertical walls, each slot presenting access to an interior surface of a vertical wall above said slot,
 each slot further presenting a horizontal surface extending from a vertical wall below said slot;
 a shelf for attachment to said support frame comprising:
 a base for supporting an item thereon;
 a mounting flange at one end of said shelf including a lip for insertion in said slot for bearing against said interior surface of said vertical wall above said slot, a horizontal wall for bearing against said horizontal surface presented by said slot and a depending wall for bearing against said vertical wall below said slot.

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