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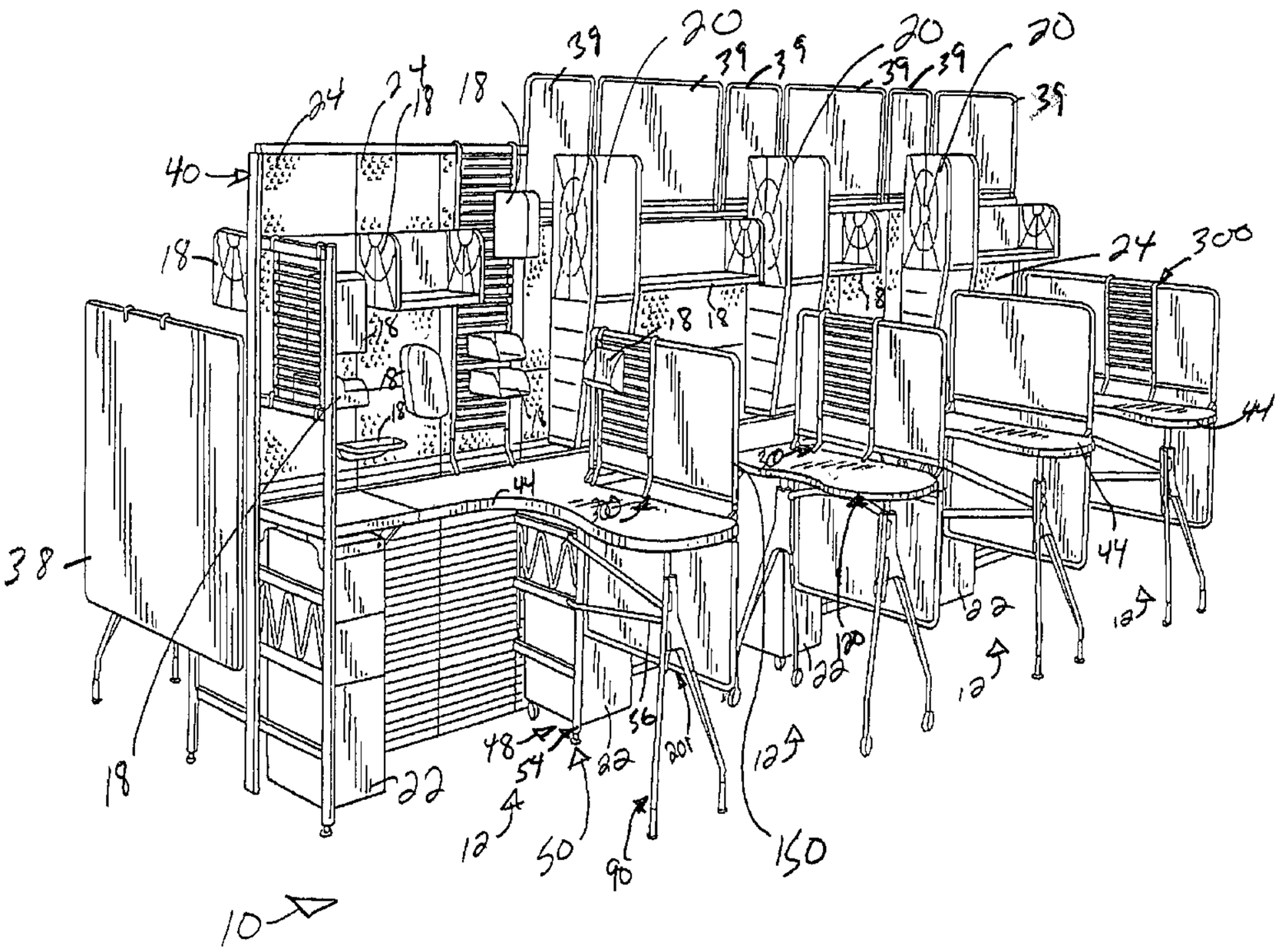
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A system (10) for defining a plurality of work zones (12) within an otherwise open area is provided. The system (10) includes a rigid spine (40) extending upward from a base surface. At least one worksurface is connected to the spine and extends outward therefrom. A support structure for the worksurface is connected to the spine and the worksurface. The support structure is capable of being adjusted in size to support worksurfaces of different sizes.

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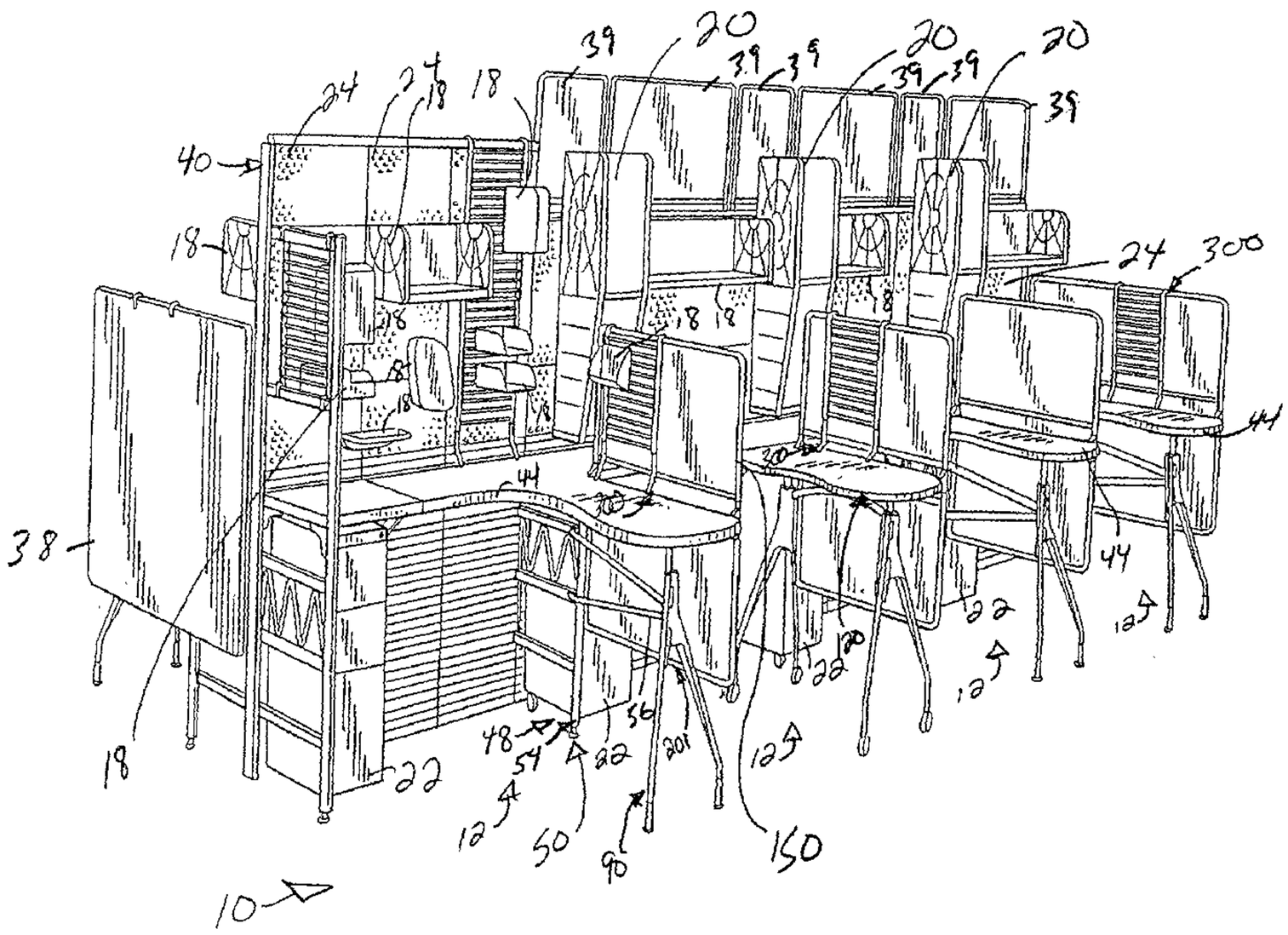
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(54) Title: FURNITURE SYSTEM




(57) Abstract: A system (10) for defining a plurality of work zones (12) within an otherwise open area is provided. The system (10) includes a rigid spine (40) extending upward from a base surface. At least one worksurface is connected to the spine and extends outward therefrom. A support structure for the worksurface is connected to the spine and the worksurface. The support structure is capable of being adjusted in size to support worksurfaces of different sizes.

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# FURNITURE SYSTEM

## FIELD OF THE INVENTION

The present invention relates generally to a furniture system for use within an open office. In particular, this invention relates to a furniture system adapted to provide improved functionality in an open collaborative work environment and in the proximate workspace of a user while providing an enhanced aesthetic appearance.

## BACKGROUND OF THE INVENTION

Because the concept of an appropriate working environment is rapidly changing, it is necessary that any system of arranging and defining work areas be capable of many different configurations allowing rapid changeover from one arrangement to another. Such systems must be flexible enough to accommodate different work activities and tools. In addition, such systems must be easily assembled or reconfigured into a plurality of space-efficient plans.

Previous systems have failed to adequately provide a flexible and efficient use of an open area workspace. For example, it has been known to erect permanent or semi-permanent space-dividing walls and then to furnish each individual work area created by these walls with furniture. The furniture used in these systems has been of the conventional type, entirely or substantially independent of the walls. Such arrangements were tolerable under circumstances in which the requirements of the activities performed within the work spaces remained relatively static over long periods of time. Also, furniture of the conventional type is static in design, often usable only for a single purpose. When not in use, conventional furniture is bulky and requires substantial storage space.

Open plan office systems or systems furniture typically provide a series of rigid panels which are in turn rigidly connected together at facing edges to divide work spaces into work or task areas. The panels are

coupled together at facing edges for straight line rectangular coupling. Vertical slots are provided at the facing edges to support brackets for hanging cabinets, shelves and worksurfaces to efficiently use the space. However, many previous system furniture designs failed to work in an optimal manner in open collaborative work settings. In addition, these systems sometimes failed to provide an efficient proximate workspace environment for a user. This issues related to a user's proximate workspace have become more pronounced as the size of a user's work area decreases.

Although traditional systems furniture remain a viable solution for many office environments, some business organizations have functional and aesthetic requirements which cannot be practically or commercially met by such a product. In particular, the increasing use of computer equipment and work teams results in the need for an extremely flexible system. In addition, the decreased size of many work environments creates the need for an enhanced proximate workspace.

Therefore, there is a need for a system that provides an improved collaborative and proximate functionality in the workspace with an enhanced aesthetic appearance.

## SUMMARY OF THE INVENTION

The present invention is directed to an improved furniture system with an increased efficiency and flexibility over previous open plan furniture systems.

According to a first aspect of the present invention, a system for defining a plurality of work zones within an otherwise open area is provided. The system includes a rigid spine extending upward from a base surface. At least one worksurface is connected to the spine and extends outward therefrom. A support structure for the worksurface is connected to the spine and the worksurface. The support structure is capable of being adjusted in size to support worksurfaces of different sizes.

According to another aspect of the invention, a screen for use adjacent to a worksurface is provided. The screen includes a framework having a top member, a bottom member and a first side member and an opposing second side member and a substantially hollow interior. A spanning element is connected to the framework and covers the interior of the framework.

According to yet another aspect of the invention, a work system capable of supporting a variety of work tools is provided. The system includes a work surface having a top surface. A framework is connected to the worksurface and extends above the worksurface. A work tool support structure is connected to the framework and includes a foot that is supported by the top surface of the worksurface.

As used herein the term "work tool(s)" is intended to be interpreted broadly and to include elements such as signage, organizers, paper trays, display trays or storage trays, personal shelves, document holders, pencil or pen holders, disk holder or document grippers and other known elements.

As used herein with respect to the spanning element, the phrase "covers the interior of the framework" is intended to include elements that either fill in the interior or cover the interior of the framework.

The present invention, together with attendant objects and advantages, will be best understood with reference to the detailed description below in connection with the attached drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a furniture system in accordance with a first preferred embodiment of the present invention;

Fig. 2 is a side view illustrating a preferred embodiment of the support structure for a worksurface as shown in Fig. 1;

Fig. 3 is an enlarged view illustrating a preferred embodiment of the connection between a support frame and the stringer;

Fig. 4 is a front view of the preferred embodiment of the a worksurface and the adjustable legs;

Fig. 5 is a top view of the adjustable legs in a first position;

Fig. 6 is a top view of the adjustable legs in a second position;

Fig. 7 illustrates a front view of a freestanding worksurface having adjustable legs;

Fig. 8 is an exploded view of a first screen assembly;

Fig. 9 is an exploded view of a second screen assembly;

Fig. 10 is an exploded view of a third screen assembly;

Fig. 11 is a enlarged view of a tool rail attached to a screen assembly; and

Fig. 12 is a cross-section of a foot of the tool rail.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is described with reference to the drawings in which like elements are referred to by like numerals. The relationship and functioning of the various elements of this invention are better understood by the following detailed description. However, the embodiments of this invention as described below are by way of example only, and the invention is not limited to the embodiments illustrated in the drawings. It should also be understood that the drawings are not to scale and in certain instances details have been omitted which are not necessary for an understanding of the present invention such as conventional details of fabrication and assembly.

The present invention is directed to a unique system 10 that divides up space into a plurality of work areas 12. Once assembled, the system 10 is self-supporting and does not depend on architecture or interior design elements of the space for stability. It should be recognized that the system 10 illustrated in Fig. 1 is one of many possible configurations for the system. The system 10 is capable of creating a plurality of workspaces of identical characteristics or unique characteristics and is also extremely effective in achieving high room densities for users. The system 10 is also useful to increase the proximate work environment for a user by increasing the accessibility for a seated worker to various work tools 18 such as files, pens

and pencils. The vertical storage members 20 also increase the accessibility of the files, papers or other work tools stored therein. In addition, the vertical storage members 20, 22 and the various tiles 24 allow light from the surrounding environment to penetrate the workspace more efficiently than in the past. In particular, the vertical arrangement of the storage members 20 allows more ambient light into a user's workspace than would exist with a traditional horizontally aligned storage member. In addition, the various tiles 24 are designed with openings to allow light to more readily pass therethrough. For a fuller description of the tiles 24 and many other features useful with the present system 10, reference is made to the U.S. Patent Application filed June 16, 2001 in the name of "Remelts et al." and entitled "Accessories For A Workspace", the disclosure of which is hereby incorporated by reference.

Fig. 1 also illustrates various screen assemblies. For example, a combination privacy screen and modesty screen 38 is shown. In addition, a number of smaller privacy screen 39 are connected to the top of the spine 40 and particularly a monorail useful with the system. Again, reference is made to U.S. Patent Provisional Application filed June 16, 2001 in the name of "Remelts et al." and entitled "Accessories For A Workspace" for fuller description of the monorail. Additional screen assemblies will be discussed herein.

The spine 40 extends the length of the system 10. A plurality of worksurfaces 44 are connected to the spine 40 and extend outward therefrom. The spine 40 and the worksurfaces 44 are constructed generally in accordance with the disclosure in U.S. Patent No. 4,685,255, entitled "Work Space Management System" and issued in the name of "James. O. Kelley", the disclosure of which is hereby incorporated by reference.

The support structure 48 supports the worksurface 44 in the first work area 50. The support structure 48 includes a support frame 54 and a stringer 56 as best seen in Fig. 2. The support frame 54 includes a

conventional fastening element 58 that includes a plurality of teeth that engage corresponding slots in the spine 40. Conventional anti-dislogement teeth further secure the support frame 54. The support frame 54 includes an upper bar 60, a middle bar 62, and a lower bar 64 that interconnect a first side 68 and a second side 70. An angled cross-brace 71 interconnects the upper bar 60 and the middle bar 62. The second side 70 includes a leg 72 that extends upward from a base surface. Levelers 73 are connected to the bottom of the spine 40 and the leg 72. The upper bar 60 and the middle bar 62 include a plurality of spaced apart apertures 74. A plurality of corresponding apertures are located on the opposite sides (not shown) of the upper bar 60 and the middle bar 62. A height-adjustable support column 78 extends upward from the second side 70 with bracket 79 connected to a bottom of the worksurface 44. A stringer connection member 80 interconnects the stringer 56 to the support frame 54. The stringer 56 includes an upper rod 84 and lower rod 86 that engage the upper bar 60 and the middle bar 62, respectively. The upper rod 84 and the lower rod 86 are connected to the leg assembly 90.

The stringer 56 can be adjustably positioned along the support frame 54, and particularly along the upper bar 60 and the middle bar 62. Accordingly, the support structure 48 is useful to support worksurfaces 44 of varying sizes. In the preferred embodiment, the apertures 74 span a distance of 18 inches to thereby accommodate worksurfaces that have a range in length of 18 inches. Moreover, the stringer 56 may be connected to the other side (the side opposite to the illustration of Fig. 2) of the support frame 54 in order to accommodate a different worksurface configuration. As a result, the support structure 48 can accommodate right-handed and/or left-handed work surface configurations. In addition, the use of the support structure 48 obviates the need for many different parts to be in inventory to accommodate different size work surfaces.

The stringer connection member 80 is best illustrated in Fig. 3. The stringer connection member 80 includes a head portion 82 and a body portion 84. The stringer connection member 80 is formed from a ionomer material and nothched to provide for additional flexability. The flexible nature of the stringer connection member 80 allows the stringer 56 to be angularly adjusted relative to the support frame 54. In a preferred embodiment, the stringer connection member 80 has a range of motion up to approximately 30 degrees. The stringer connection member 80 allows the same support structure 48 to be used to accommodate different worksurfaces, e.g., worksurfaces that extend straight off the spine 40 or corner worksurfaces.

With reference to Fig. 4, the leg assembly 90 is connected to a bottom surface 91 of one of the worksurfaces 44. More specifically, the column 92 is connected to the worksurface connector 94. The column 92 includes a plurality of apertures 98 that engage a fastening element within the leg assembly 90 to properly support the worksurface 44 at the selected height. The apertures 98 extend along a length of the column 92, e.g., five inches, in order to readily accommodate a range of heights. The leg assembly 90 also includes adjustable feet 100.

The adjustability of the leg assembly 90 is best illustrated in Figs. 4-6. The leg assembly 90 includes a first leg member 102 and second leg member 104. The first leg member 102 includes a neck portion 108 and the second leg member 104 includes a neck portion 110. The neck portions 108, 110 include mating collar or hinge portions 114, 116, respectively. The collar portions 114, 116 have a tubular-shaped channel extending therethrough. The column 92 passes into the tubular-shaped channel and is secured therein. The first leg member 102 and second leg member 104 are connected in an angularly adjustable manner. In particular, with reference to Fig. 5, the first leg member 102 and the second leg member 104 form approximately a ninety degree angle. With reference to Fig. 6, the

first leg member 102 and the second leg member 104 form approximately a one hundred and eighty degree angle which is particularly useful with a large worksurface. It should be recognized that the leg assembly may be adjusted to provide a wide variety of additional angles.

While the leg assembly 90 is discussed with reference to the worksurface 44, they are also useful with the freestanding worksurface assembly 120 of Figs. 1 and 7. The freestanding worksurface assembly 120 also includes a worksurface 124, a support rod 125 and castors 126. The castors 126 provide for easy movement of the worksurface assembly 120 across a base surface.

Figs. 8-10 illustrate some of the screen assemblies for use with the system 10. Fig. 8 illustrates an exploded view of a pillow screen assembly 150. The pillow screen assembly 150 includes a pillow shaped fabric cover 152 . The fabric cover 152 includes spaced apart opposing sides that slide over the framework 158. The framework 158 (preferably formed from conventional materials such as steel) includes a top bar 160, a bottom bar 162 and a first side bar 164 and a second side bar 168. The framework 158 defines a hollow interior 169. The bottom bar 162 includes pegs 170 that fit within the apertures 172 of the first and second side bars 164, 168. The first side bar 164 and the second side bar 168 include end portions 176 and 178, respectively. Clamps 190 (preferably formed from die cast aluminum) are used to connect the screen assembly 150 to a worksurface. The end portions 176 and 178 fit within the channel 192 in each clamp 190. Fastening elements such a set screws (not shown) fit in the apertures 200 in order to secure the screen assembly 150 to the clamp 190. While the upper set of apertures 200 is useful to secure a privacy screen assembly such as the screen assembly 150 as shown in Figs. 1, a modesty screen assembly 201 may be also connected to the clamp 190 in the same general manner. The clamp 190 includes a clamping surface 202 and a set screw 204 that is rotated upward to be secured to the edge of a worksurface 44

(and/or 124). A pad 210 may also be used to prevent any damage to the worksurface. Accordingly, the clamp 190 is a versatile element that can connect a privacy screen, a modesty screen, or both to a worksurface 44 (and/or 124).

Fig. 9 illustrates an exploded view of a banner screen assembly 240. The banner screen assembly 240 operates in the same general manner as does the pillow screen assembly 150 and includes the same framework 158 and clamp 190. However, the banner screen assembly 240 is different through the use of the banner insert 250. The banner insert 250 includes a top tube 260 and a bottom tube 262 that slip over the top bar 160 and the bottom bar 162. The corners 270, 272 are removable to allow for the banner insert 250 to be slipped over the top and bottom bars 160, 162. The banner insert 250 also includes a body portion 264 formed from a single sheet of material.

The fabric used to form the fabric cover 152 and banner insert 250 can include conventional materials. In addition, materials such as those disclosed in United States Patent Application filed June 15, 2001 in the names of "Loser et al." and entitled "Methods and Apparatus For Decorating Interior Environments", which is hereby incorporated by reference, may also be used.

Fig. 10 illustrates an exploded view of an insert screen assembly 280. The insert screen assembly 280 operates in the same general manner as does the pillow screen assembly 150 and includes the same framework 158 and clamp 190. However, the insert screen assembly 280 is different through the use of the insert members 280, 282 (only one used at a time). The insert 280 is formed from a marker board material and the insert 282 is formed from a tackable material. A retaining clip 286 is connected to either insert 280, 282 in order to secure the insert 280, 282 within the interior 169 of the framework 158. The retaining clip 286 includes a top member 290, a bottom member 292, a first side member 294, a second side member 296

and corner members 298. Each member forming the retaining clip 286 includes a concave outer edge adapted to engage the inside edge of the framework 158. Each member of the retaining clip also includes a slot adapted to receive one of the inserts 280, 282. It should be recognized that additional types of material could be used to form the insert e.g., a transparent plastic material. Moreover, materials having other functional purposes could also be used to form the insert.

Fig. 11 illustrates a preferred embodiment of the tool rail 300 connected to the worksurface 44 via the clamp 190. The tool rail 300 includes a bent top connection member 302. The top connection member 302 is connected to the framework 158 and particularly, the top bar 160. The tool rail 300 includes sides 304 and crossbeams 306. Work tools can be attached to the crossbeams 306 and secured thereto. Work tools include signage, organizers, paper trays, display trays or storage trays, personal shelves, document holder, pencil or pen holders, disk holder or document gripper and other known elements. The base of the tool rail includes feet 320. The sides 304 extend downward into channels 322 in each of the feet 320. The feet 320 support the tool rail 300 upward from the worksurface 44. The feet 320 are adjustable upward or downward to properly meet the worksurface 44. A screw 324 can be adjusted upward or downward within a threaded slot 326. Accordingly, the screw 324 pushes upward on the side 304 and lets the side 304 come downward further into the slot 326. In essence, the distance between the each foot 320 and the lowest crossbeam is controlled by the adjustment of screw 324. Accordingly, the tool rail 300 can be loaded with work tools while causeing a limited deflection in the screen assembly 150 because the feet 320 bear substantially directly on the worksurface 44.

The embodiments described above and shown herein are illustrative and not restrictive. The scope of the invention is indicated by the claims rather than by the foregoing description and attached drawings. The

invention may be embodied in other specific forms without departing from the spirit of the invention. Accordingly, these and any other changes which come within the scope of the claims are intended to be embraced herein.

WE CLAIM:

1. A system for defining a plurality of work zones within an otherwise open area comprising:

a rigid spine extending upward from a base surface;

at least one worksurface connected to the spine and extending outward therefrom;

a support structure for the worksurface connected to the spine and the worksurface, the support structure capable of being adjusted in size to support worksurfaces of different sizes.

2. The system of claim 1 wherein the support structure includes a support frame and a stringer.

3. The system of claim 2 wherein the support frame is connected to the spine and the stringer connected to the support frame.

4. The system of claim 3 wherein the stringer is capable of connected to the support frame at multiple locations therealong.

5. The system of claim 4 wherein the stringer is capable of being connected on a first side or a second side of the support frame, the first and second sides being opposite sides.

6. The system of claim 5 further comprising a stringer connection member that interconnects the stringer and support frame.

7. The system of claim 6 wherein stringer connection member engages one of a plurality of apertures within the support frame.

8. The system of claim 7 wherein the stringer connection member is formed from a flexible material.

9. The system of claim 8 wherein the stringer is connected to a leg which supports an end of the worksurface.

10. The system of claim 9 wherein the leg includes a first portion and a second leg portion, the first and second leg portions being angularly adjustable.

11. A screen for use adjacent to a worksurface comprising:

a framework having a top member, a bottom member and a first side member and an opposing second side member and substantially hollow interior;

a spanning element connected to the framework and covering the interior of the framework.

.12. The screen of claim 11 wherein the spanning element is formed from a fabric.

13. The screen of claim 12 wherein the spanning element fits substantially over the framework.

14. The screen of claim 11 wherein the spanning element is connected to less than all of the top member, the bottom member, the first side member and the second side member.

15. The screen of claim 14 wherein a portion of the spanning element is fit within the interior and is formed from a single piece of fabric.

16. The screen of claim 11 wherein the spanning element includes a clip that interconnects the spanning element to an interior portion of framework.

17. The screen of claim 16 wherein spanning element includes a rigid element.

18. The screen of claim 17 wherein the rigid element is a marker board.

19. The screen of claim 18 wherein the screen is a tackable material.

20. A work system capable of supporting a variety of work tools comprising:

a work surface having a top surface;

a framework connected to the worksurface and extending above the worksurface;

a work tool support structure connected to the framework and including a foot is supported by the top surface of the worksurface.

21. The work system of claim 20 wherein the work tool support structure is shaped generally like a ladder.

22. The work system of claim 21 wherein the foot is height adjustable.

23. The work system of claim 22 wherein work tool support structure includes two opposing sides and a plurality a spaced apart support rods that interconnect the two opposing sides.

24. The work system of claim 23 further a work tool connected to the work tool support structure.

25. The work system of claim 24 wherein the work tool comprises a paper tray.

26. The work system of claim 24 wherein the work tool comprises a file folder.

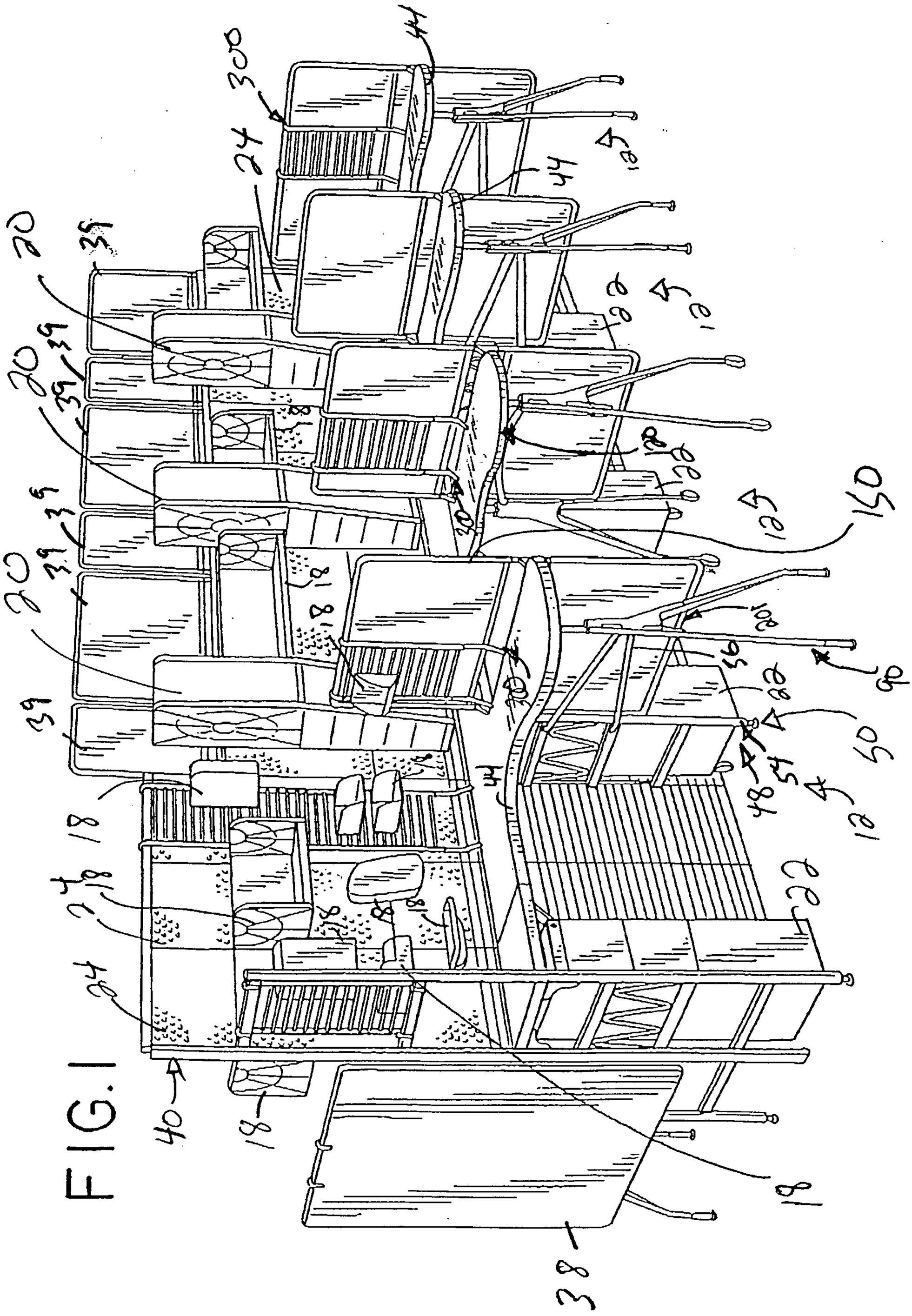

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FIG. 1

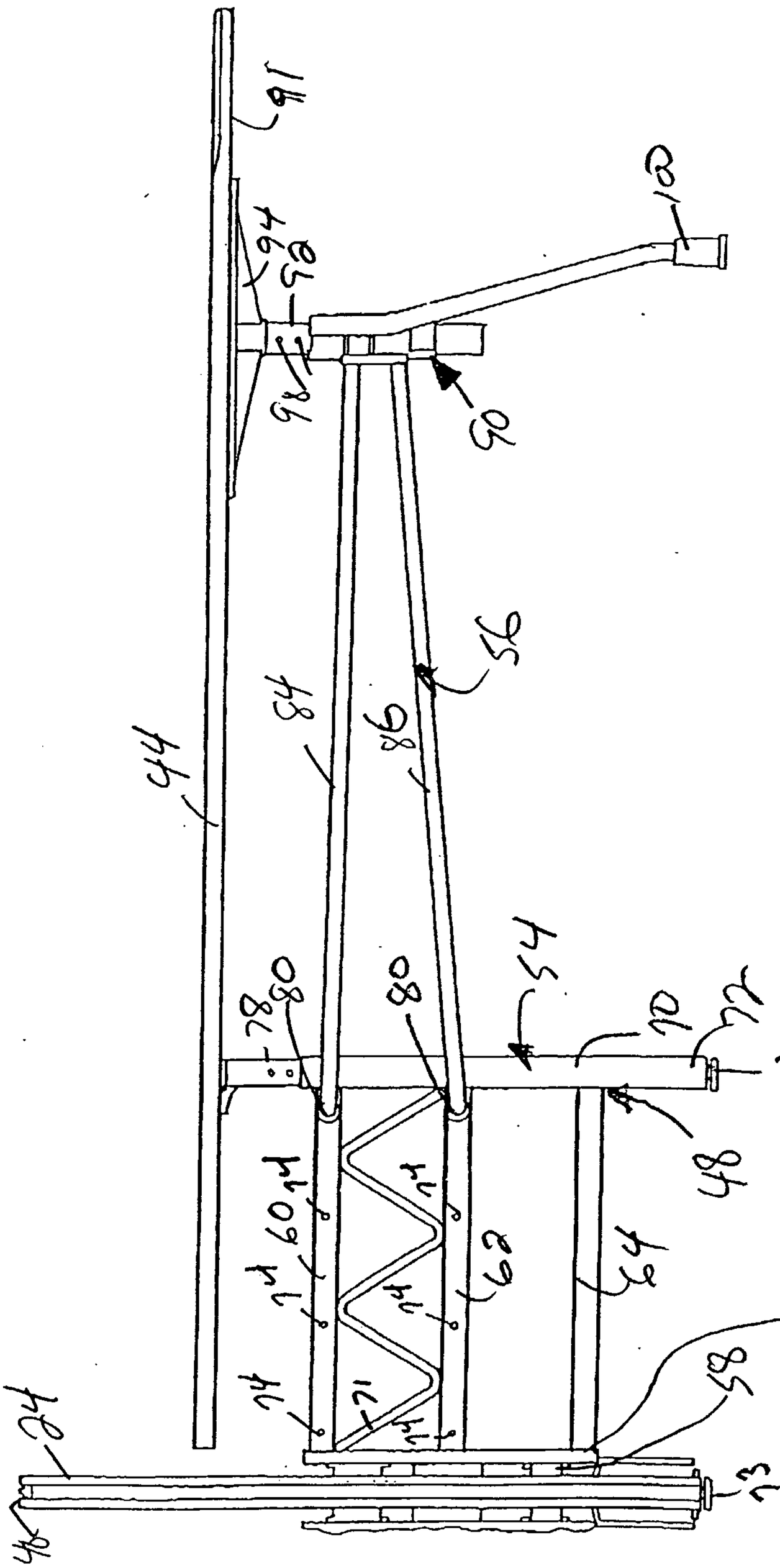



FIG.2

FIG. 3

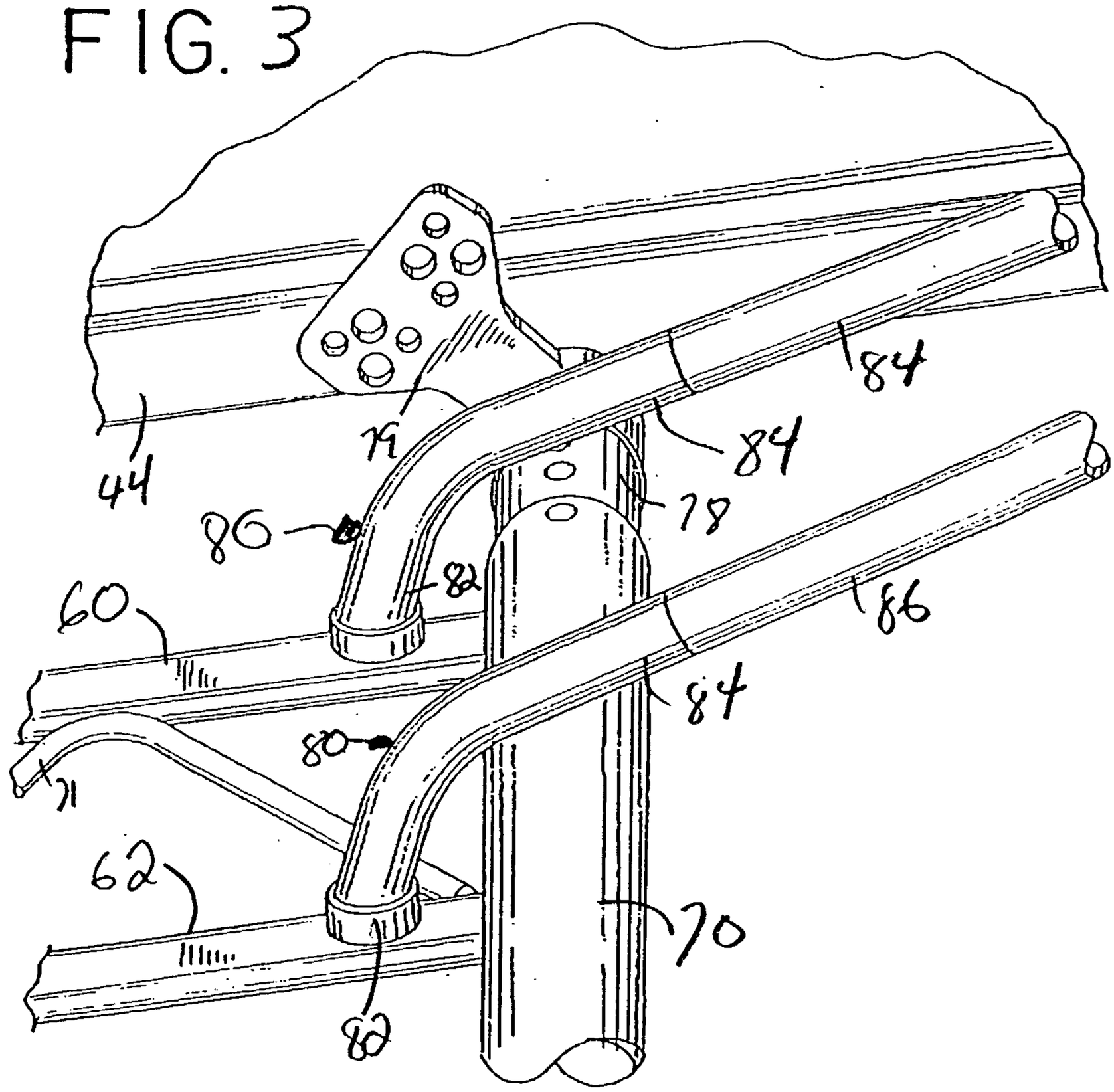


FIG. 4

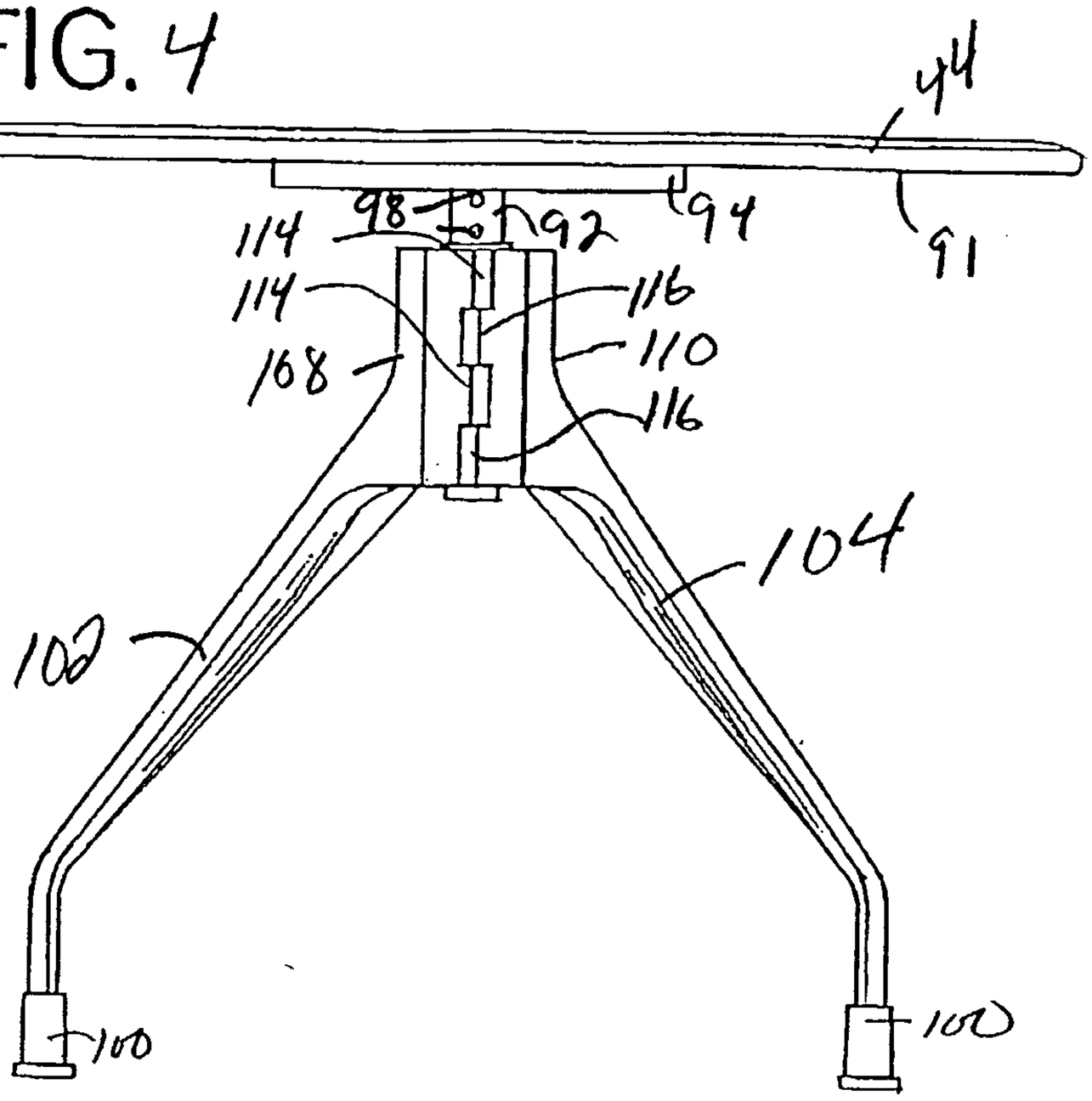



FIG. 5

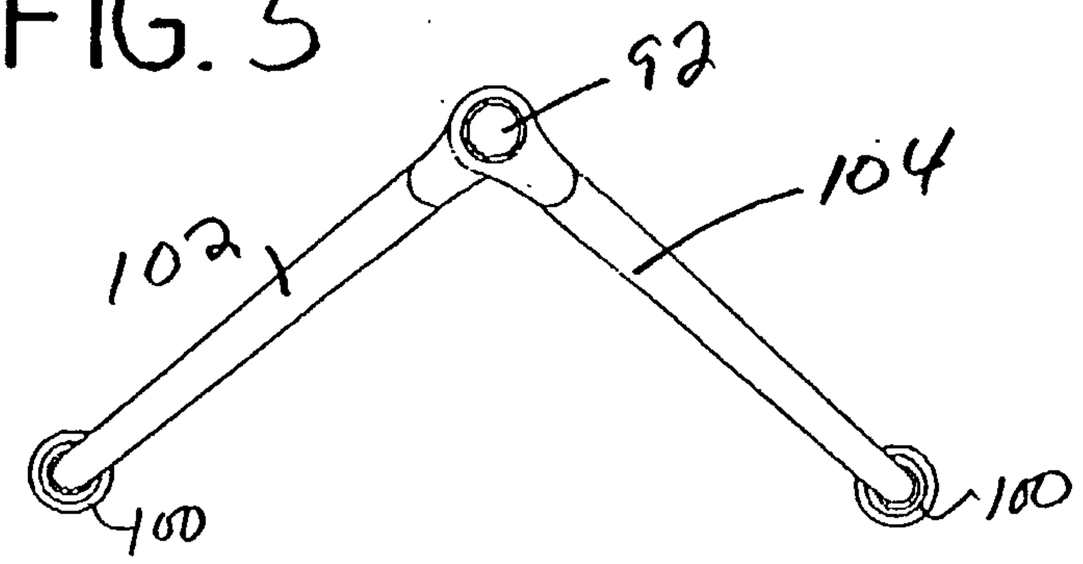
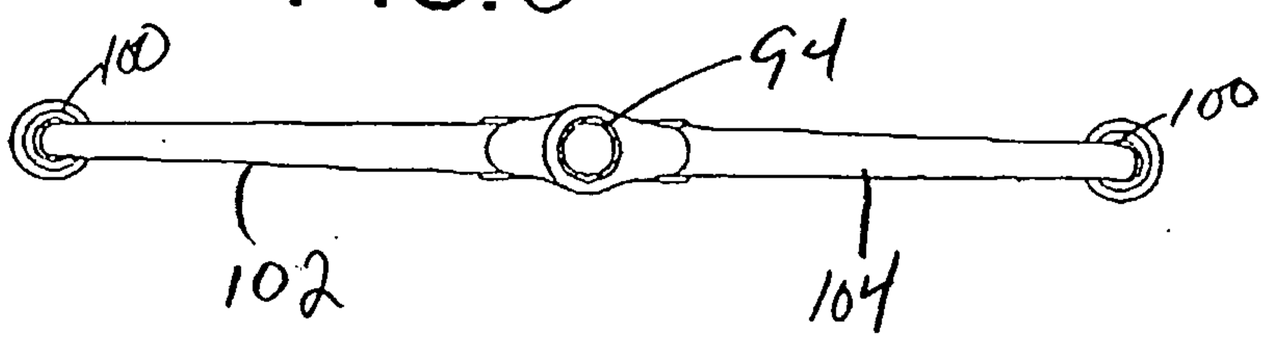



FIG. 6



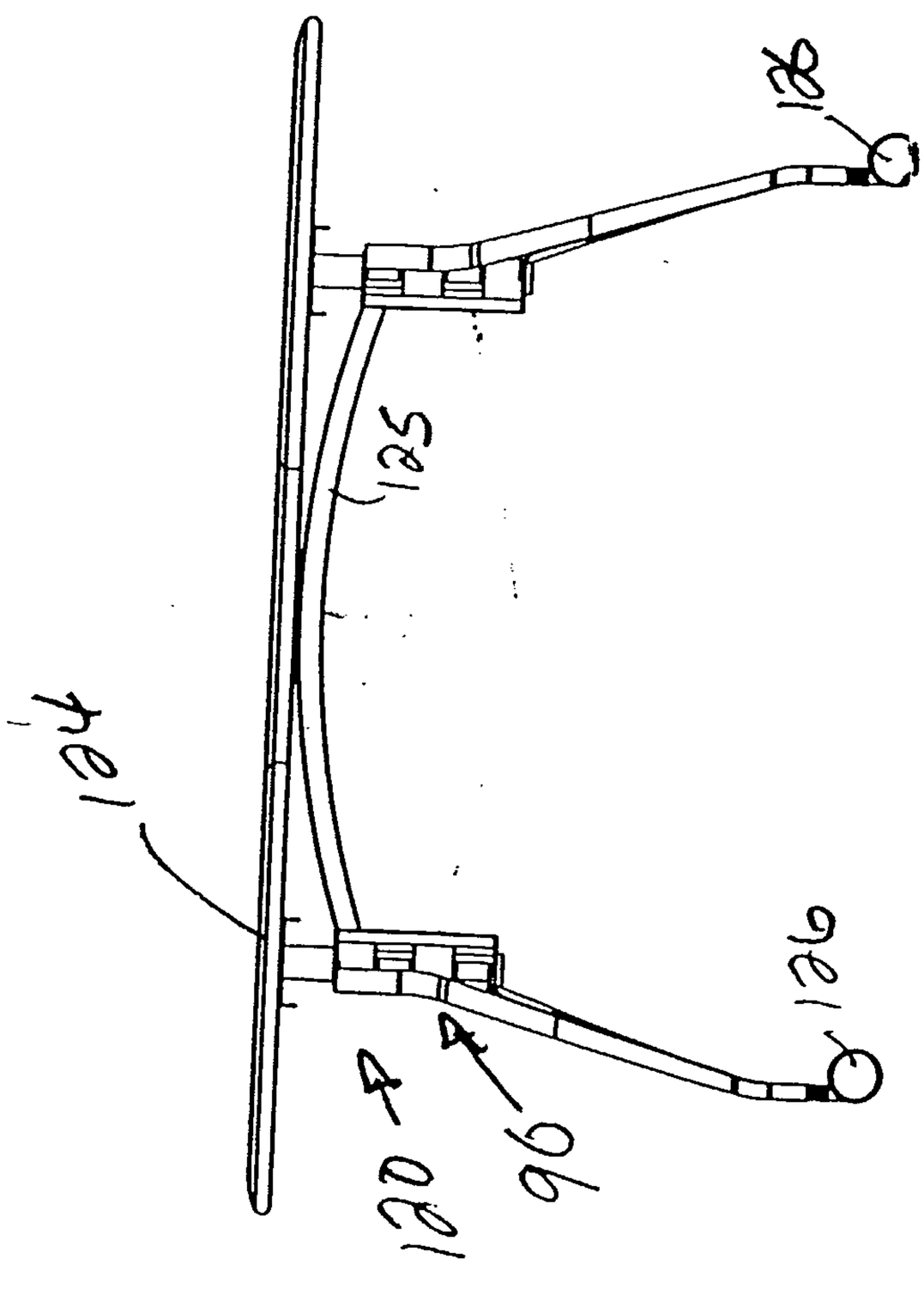



Fig. 2

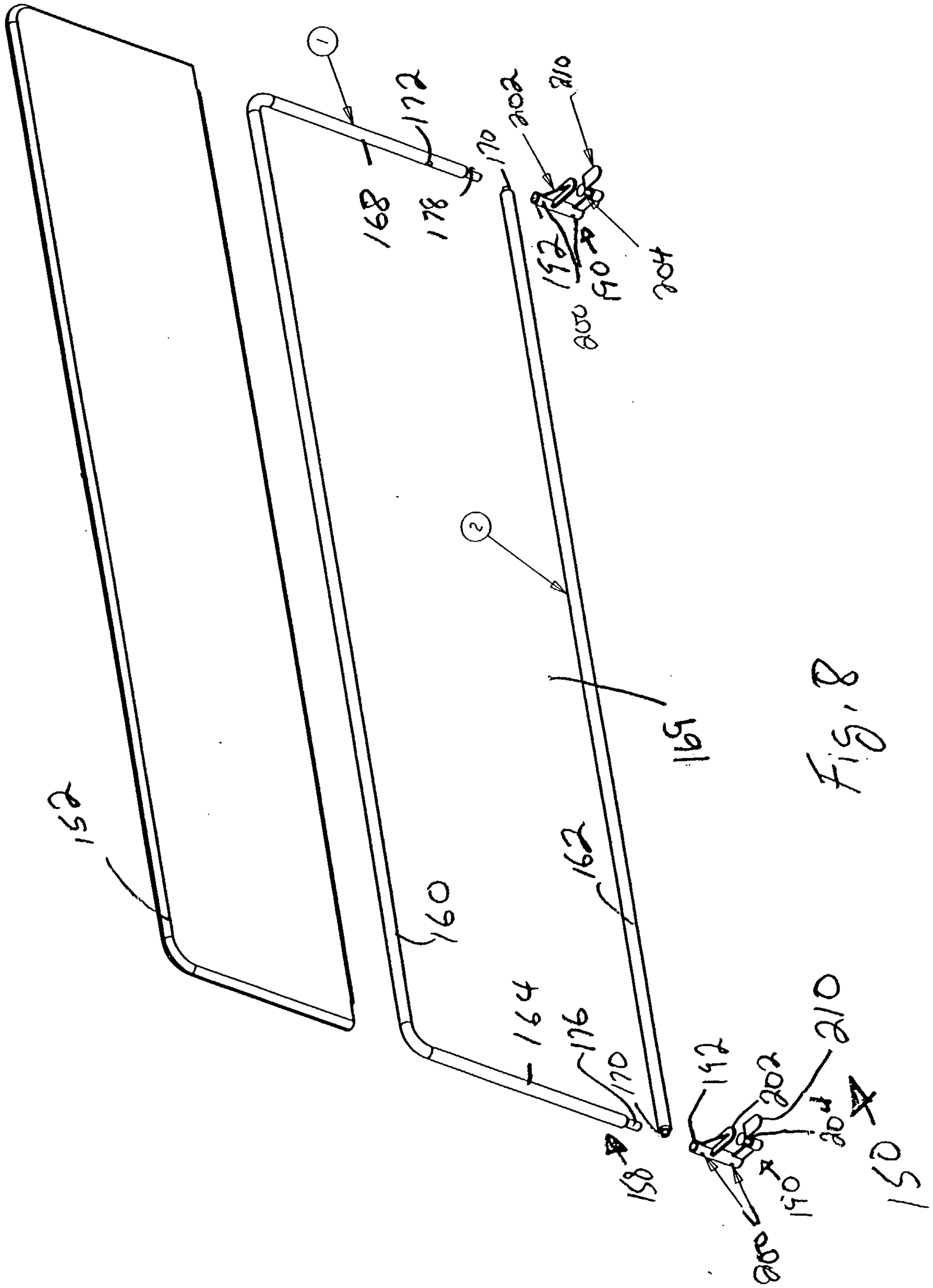

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Fig. 8

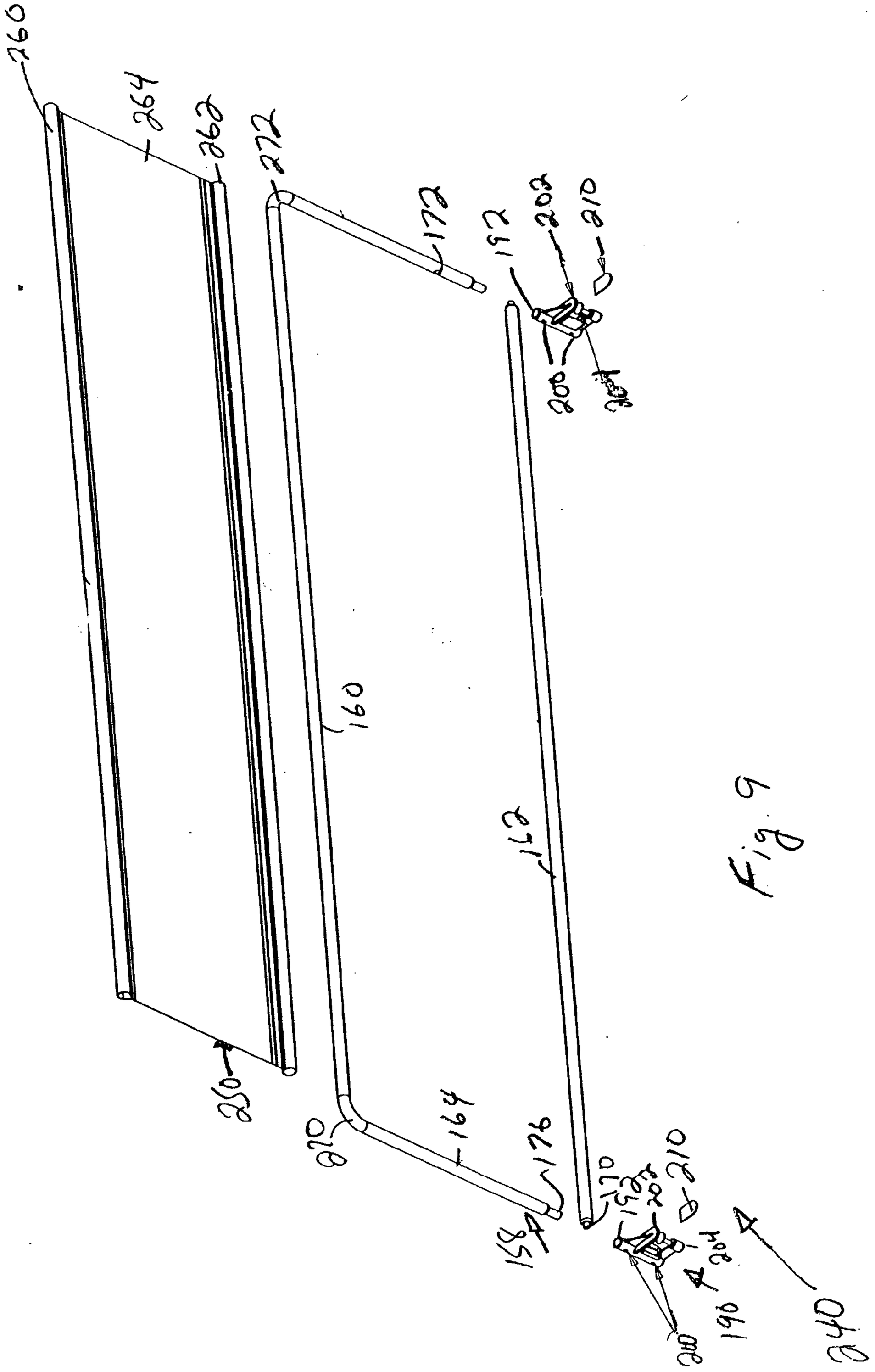

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Fig. 9

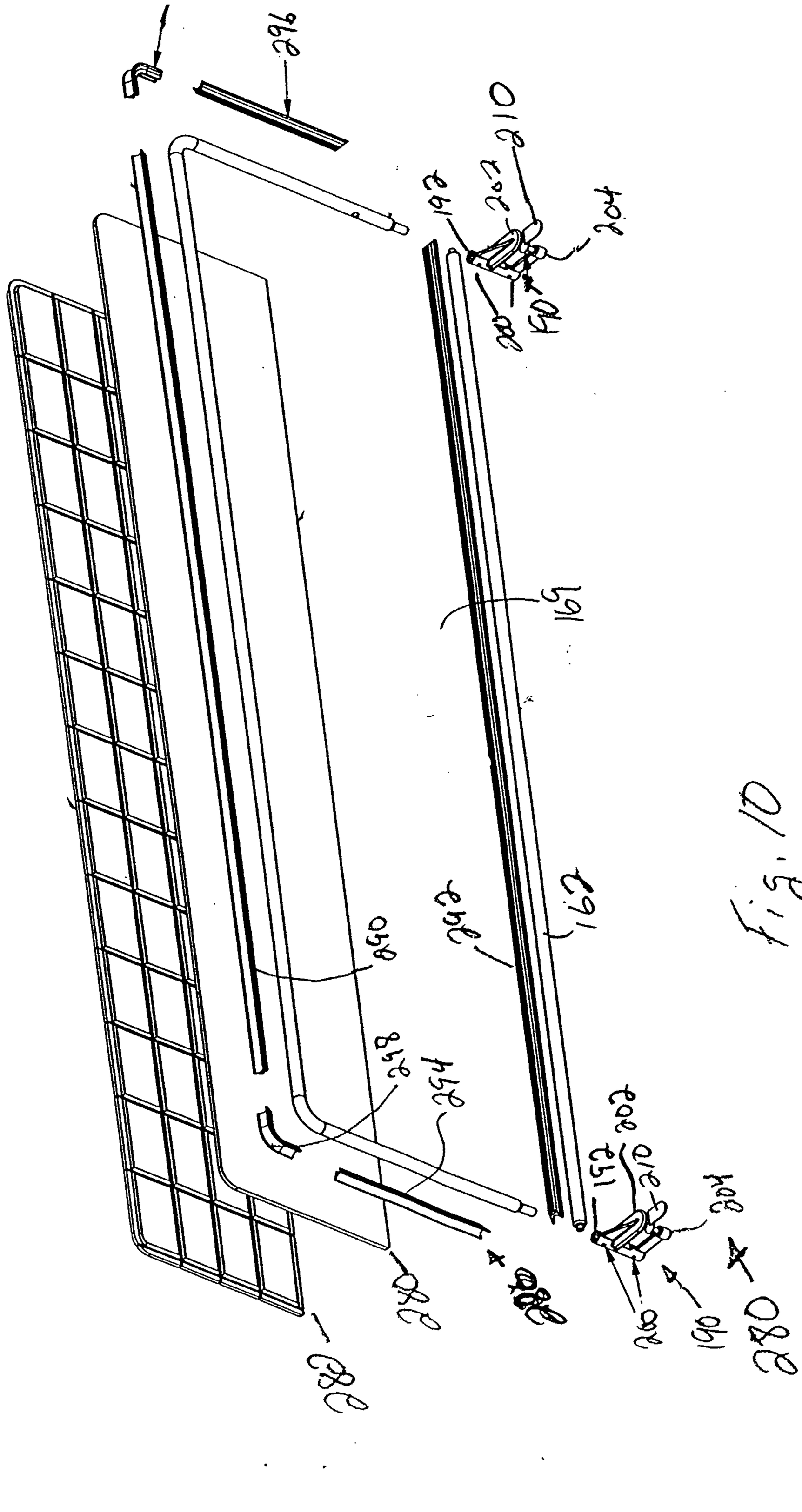

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Fig. 10

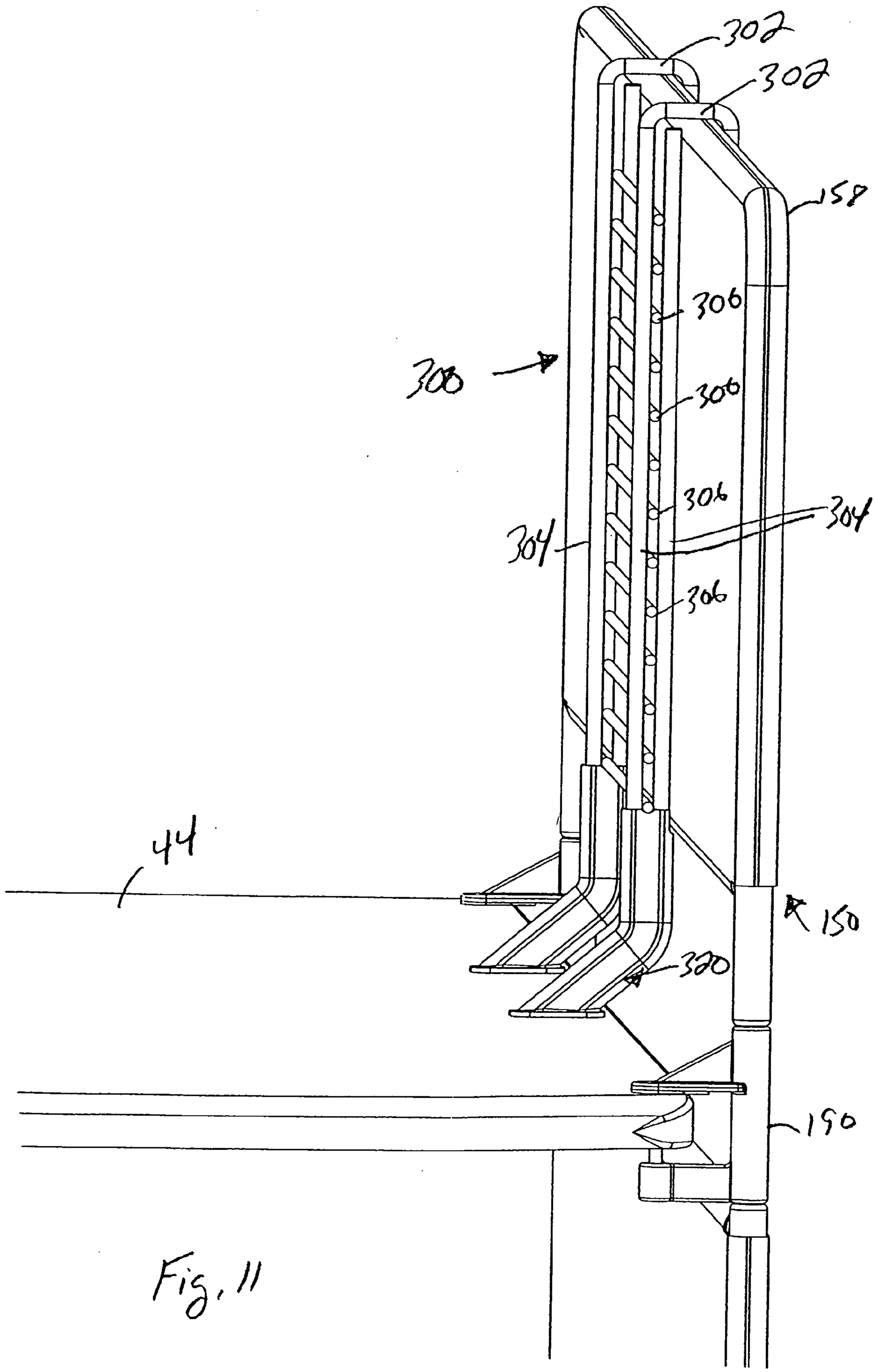
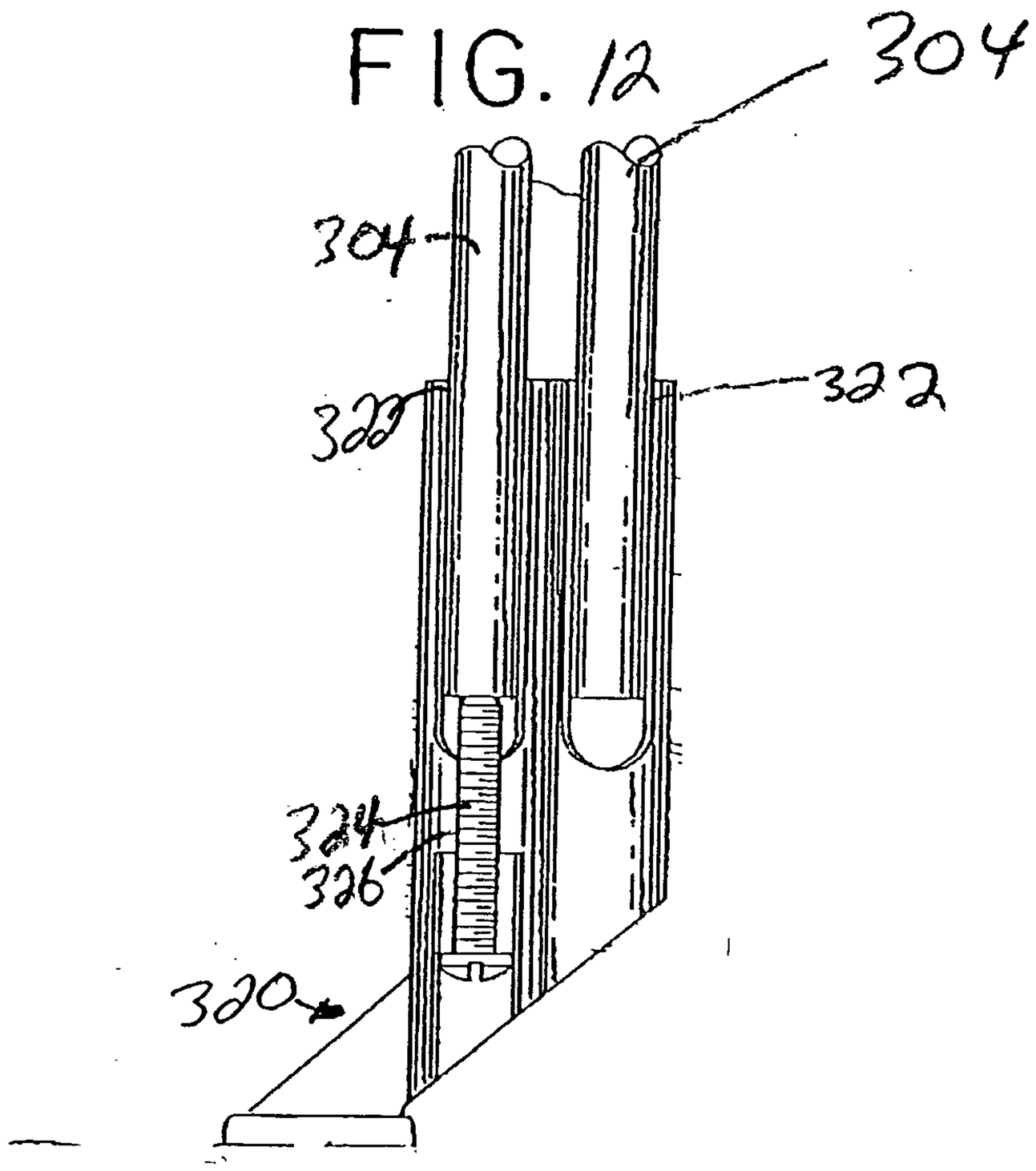
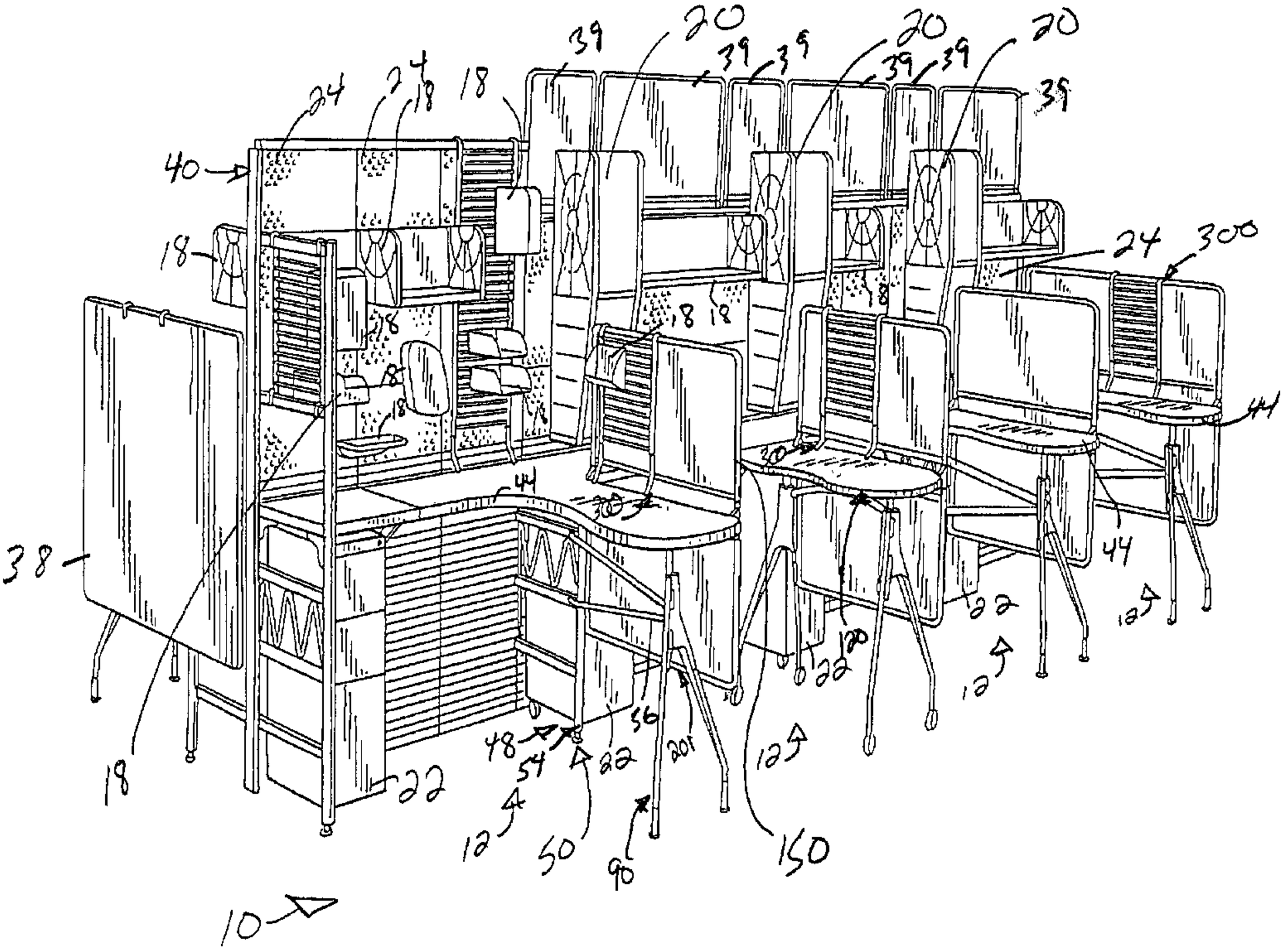



Fig. 11

FIG. 12




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300
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38
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48
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56
201
125
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90
150
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