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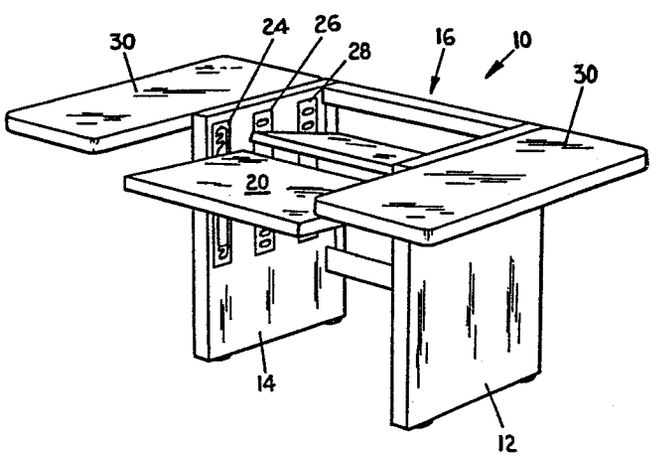
(54) VDT stand.

(57) A video display terminal stand for supporting a video display and keyboard for independent vertical and tilt adjustment comprising a pair of side walls (12, 14) rigidly joined together and having on inside surfaces elongated slots (72) with upwardly-projecting fingers (74) defining coves (76) in which are received vertically spaced bushings (104) on a bracket (98) which is secured to a keyboard surface (96) for adjustably supporting a keyboard. One set of vertically spaced tube openings (82) on each side wall (12, 14) inner surface receives bushings (116, 124) which are secured to a front portion of a video display support panel. Another set of vertically spaced tube openings (82) on each side wall (12, 14) inner surface receives bushings (152, 158) on an elongated support tube assembly (148) to support a rear portion of the video display support panel.



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VDT STAND

Field of the Invention

This invention relates to furniture for video display terminals having separate keyboards and visual display units, and more particularly relates to a video display terminal stand in which a keyboard support and video display support are independently adjustable for vertical and tilt orientation.

Background of the Invention

A variety of equipment has been designed to accomodate video display terminals. Examples of this equipment are found in the following publications:

Algrin, French patent publication No. 2,480,581, issued October 23, 1981;

Tellier et al, European patent application No. 0 010 491, published April 30, 1980;

Gutmann, Jr. et al, U.S. patent No. 3,778,125, issued December 11, 1973;

Derdzinski et al, U.S. patent 4,113,331, issued September 12, 1978;

Naess et al, U.S. patent 4,145,097, issued March 20, 1979;

Foster, U.S. patent 4,313,112, issued January 26, 1982;

Fritz, U.S. patent 4,316,082, issued February 16, 1982.

A table marketed by Roneo-Vickers comprises standard desk legs with sheet-metal plates having vertical slotting mounted thereon. Elongated tubes are bolted onto the plates in the slotting to provide supports for a CRT support surface.

Some of the prior VDT support equipment have fixed support surfaces for the video display and/or keyboard. Some have tiltable surfaces for the video display. The European publication and the French patent publication describe a video display surface which is

both vertically and tiltably adjustable. The mechanisms therefor are fairly complex and relatively expensive. The Roneo-Vickers support desk is less complex and less expensive but requires considerable effort in bolting and unbolting the tubes to the sheet-metal plates.

It is desirable to have the video display support surface both height adjustable and independently tilt adjustable to suit the needs of different users. The adjustments should be fairly easy to make but need not ordinarily be carried out on a daily basis. With increasing use of video display terminals, the cost of the equipment should be fairly low to meet mass market objectives.

The keyboard support should also be adjustable for height independently of the video display support surface. Some systems provide such a function. It is also desirable to provide a tilt function for some users. A tilt function has not heretofore been provided. Further, the combinations of functions have not been provided in a simple, inexpensive piece of equipment in which height and tilt adjustments are easily made and the adjusted panels are secure against inadvertent movement or adjustment.

Summary of the Invention

According to the invention, there is provided a video display terminal stand for supporting a video display and a separate keyboard for independent height and tilt adjustment with respect to each other in a simple and inexpensive piece of equipment. The stand comprises a pair of side walls rigidly joined together in spaced-apart relationship. A video display support panel for supporting a video display is mounted to the side walls for independent vertical and tilt adjustment of the panel with respect to the side walls. A keyboard panel is also mounted to the side walls to provide independent vertical adjustment with respect to the side walls. Preferably, the keyboard panel is also mounted for tilt adjustment with respect to the side walls.

The keyboard panel mounting means comprises a keyboard panel and depending brackets mounted thereto. Vertically elongated slots and interlocking bushings are provided for adjustably securing the bracket to the side walls. The elongated slots comprise a vertical elongated slot with fingers projecting into the slot and defining bushing-receiving coves. In the preferred embodiment, the slot is positioned on the inside surface of each side wall and the fingers project upwardly to form upwardly-opening coves therebetween. The bushings are therefore mounted in spaced relationship on the depending brackets.

The video supply support surface mounting means preferably comprises two sets of vertically spaced receiving means on the inside of the side walls. A first support means is provided for engaging one set of receiving means and a second support means independent of the first support means are provided for engaging a second set of receiving means. The receiving means are preferably holes and the support means comprise bushings which extend into the holes. The bushings have shoulders which abut a surface of the side walls adjacent the holes. At least one of each set of bushings is retractable to facilitate removal of the first and second support means and for repositioning the same in different ones of the receiving means. Preferably, one set of the support means is secured to the video display support surface the the other set of the support means is independent of the video display support surface.

In accordance with one aspect of the invention, the back wall comprises a plurality of separate panels removably joined to the side walls. The video display terminal in one aspect of the invention, extends rearwardly and beyond the back wall.

Further, according to the invention, a foot rest is provided between the side walls. The foot rest comprises a bar rigidly secured to the side walls at a lower portion thereof and a foot-rest pad with means for

securing the foot-rest pad to the bar. Laterally-extending table surfaces can be provided on the outside of the side walls to provide other support surfaces.

Brief Description of the Drawings

The invention will now be described with reference to the accompanying drawings in which like numerals are used to describe like parts and in which:

Figure 1 is a perspective view of a video display terminal stand according to the invention;

Figure 2 is an exploded perspective view of a portion of the video display terminal stand illustrated in Figure 1 with certain portions shown in phantom lines;

Figure 3 is a bottom view of a support bracket shown in Figure 2;

Figure 4 is a perspective view of a modified form of the invention; and

Figure 5 is a side elevational view in section of a bottom of the stand showing an optional foot rest.

Description of the Preferred Embodiment

Referring now to the drawings, and to Figure 1 in particular, there is shown a video display terminal (VDT) stand 10 having side walls 12 and 14, a back wall 16, a keyboard surface 20 and a video display surface 22. The side walls are joined together at a central portion through a stretcher bar 18 (illustrated in Figure 2). Each of the side walls 12 and 14 has on the inner surfaces thereof a keyboard vertical support plate 24, and two video display vertical support plates 26 and 28. A side table 30 is mounted to the outside of each of the side walls 12 and 14 through conventional side brackets (not shown).

Referring now to Figure 2, portions of the VDT stand are shown in exploded view. The side wall 12 is a mirror image of side wall 14. For purposes of brevity, only side wall 14 will be described. The side wall 14 comprises a side panel 40 having a vertical indentation 42 comprising a shallow outer indentation 44 and a

deeper inner indentation 46. A vertical indentation 48 has an outer shallow indentation 50 and a deeper inner indentation 52. Likewise, a third vertical indentation 54 has a shallower outer indentation 56 and a deeper inner indentation 58. A rectangular recess 60 is also provided on the inner surface of the side panel 40. The panel 14 can be constructed of any suitable material but is preferably made from a wood product, such as compressed particle board and can have outer veneer coatings of plastic or wood. A conventional edge molding can be provided around the edge of the panel.

An inset shroud 62 having a bottom surface 64 and an upstanding side wall 66 is positioned within the deeper indentation 46. The keyboard vertical support plate 24 has an elongated slot 72 with upwardly directed fingers 74 forming downwardly-opening coves 76. The keyboard vertical support plate 24 is secured to the panel 14 through wood screws (not shown) which extend through screw holes 78. The attachment of the keyboard vertical support plate 24 to the panel 40 retains the insert shroud 62 in place in the deeper indentation 46. The keyboard support plate 24 fits within the shallower indentation 44 so that the support plate 24 is flush with the inner surface of the side panel 40.

The video display vertical support plate 26 comprises a plurality of screw holes 80 and a plurality of vertically spaced tube openings 82. The video display support plate 26 is secured to the side panel 40 through screws (not shown) which extend through the screw holes 80 and into the side panel 40. The vertical support plate 26 fits within the outer shallow indentation 50 so that the support plate 26 is flush with the inner surface of the panel 40. When the support plate 26 is installed in the shallow indentation 50, the tube openings 82 will be in registry with the deeper indentation 52.

The vertical support plate 28 is of identical construction with the support plate 26 and is positioned

within the shallow outer indentation 56 in the same manner as the support plate 26 is positioned within the shallow indentation 50.

The stretcher bar 18 comprises a rectangular tube 86 which is secured to an end plate 88 having screw holes 90. The end plate 88 fits within the rectangular recess 60 so that the end plate 88 is flush with the inner surface of the side panel 40. Screws (not shown) extend through the screw holes 90 and secure the end plate 88 to the side panel 40. The opposite side of the stretcher bar 18 is identical and is secured to the side wall 12 in an identical manner.

Stem glides 92 are provided on the bottom of the panel 40 and are threaded into the bottom edge thereof to support the VDT stand on a floor surface.

The keyboard surface 20 comprises a keyboard panel 96 which can be made of any suitable materials such as wood. The panel 96, shown in phantom lines in Figure 2, can be made of compressed particle board and covered with a plastic or wood veneer surface. Conventional edge molding can be provided around the edges of the panel 96. A pair of support brackets 98 (only one of which is shown in Figure 2) are mounted to the bottom surface through screws (not shown) which extend through screw holes 100. The bracket 98 has a leg in which are positioned a pair of spaced screw holes 102. Support bushings 104 have threaded openings 106 on one end and a projecting journal 110 and a shoulder 108 at the other end. The support bushings are secured to the depending portions of the support bracket 98 through screws (not shown) which extend through the screw holes 102 and are threaded into the threaded openings 106.

The projecting journals 110 of the support bushings 104 are selectively positioned in two of the downwardly-opening coves 76 of the elongated slot 72 with the shoulders 108 abutting the outside surface of the support plate 24 to releasably retain the keyboard surface 20 in an appropriate position in the VDT stand

between the side wall 12 and 14.

The keyboard panel 96 can be adjusted from a horizontal pitch to a slightly forward pitch, in addition to being height adjustable. Positioning of both of the support bushings 104 in downwardly-opening coves 76 will result in the keyboard panel being horizontal. The keyboard panel can be pitched slightly forward by positioning only the top bushings 104 in downwardly-opening coves 76 and placing the bottom bushings 104 against the back edge of the slot 72. The moment created by the keyboard panel about the upper of the top bushings 104 will keep the lower bushings firmly against the back edge of the slot 72.

The video display surface assembly 22 comprises a video display panel 112, a support bracket 114 and a support bracket 122. The support bracket 114 has a bushing 116 with an outwardly- extending journal 118 and a shoulder 120. The support bracket 122 comprises a retractable bushing 124, having an outwardly-extending journal 126 and a shoulder 128. As shown in Figure 3, the bushing 124 is slidably mounted within a bore 134 which has a spring 136 at the inner end thereof. An axial slot 138, a lateral lock slot 140 and a lateral lock slot 142 are formed in the bottom of the bracket 122. A pin 144 is secured to the bushing 124 and extends through the slots 138, 140 and 142. In Figure 3, the pin 144 is shown in the lateral lock slot 140. The support brackets 114 and 122 have outwardly-extending flanges 130 with screw holes 132 through which the brackets are secured to the underside of the video display panel 112 through conventional screws (not shown).

The bushing 124 can be operated manually by moving the pin 144 between the lock slots 140 and 142 along the axial slot 138. Thus, to retract the bushing 124, one moves the pin 144 from the lateral lock slot 140, to the axial slot 138 and thereafter to the lateral slot 142. The locking of the bushing 124 in retracted

position permits the video display surface assembly 22 to be easily adjusted vertically within the tube openings 82.

The projecting journals 118 and 126 fit within the tube openings 82 of the vertical support plate 26 to position the front end of the video display surface assembly at a desired height.

The video display surface assembly 22 also comprises a support tube assembly 148 comprising a hollow tube 150 having a fixed bushing 152 at one end and a retractable bushing 158 at the other end. The fixed bushing 152 has an outwardly- projecting journal 154 and a shoulder 156. The retractable bushing 158 is spring mounted within the right end of the hollow tube 150 in a manner similar to the mounting of the retractable bushing 124 in the support bracket 122. A pin (now shown) can be used to actuate the retraction of the bushing 158 in the end of the tube 150. A journal 160 and a shoulder 162 are provided on the outer portion of the bushing 158 for engagement with the tube openings 82 of the vertical support plate 28. Thus, the support tube assembly 148 is mounted to the support plates 28 by inserting the journals 154 and 160 into the tube openings 82 of the support plates 28 with the shoulders 156 and 162 bearing against the outer surface of the plates 28.

The back surface of the video display panel 112 rests on the support tube assembly 148. Thus, adjusting the height of the support tube assembly 148 will adjust the height of the back portion of the video display panel 112. Thus, the height and tilt of the video display surface assembly 22 can be adjusted through movement of the brackets 114 and 122 and the support tube assembly 148 in the respective tube openings 82 of the vertical support plates 26 and 28.

The back wall 16 comprises a series of removable panels 166, 176 and 166'. The panels 166 and 166' have side flanges 168 with slots 170 through which the

panels 166, 166' are mounted to the side walls 12 and 14 through conventional screws (not shown). A top rolled flange 172 is provided on top of the panel 166 and a bottom flange 174 is provided on the bottom of the panel 166. An L-shaped flange 186 is also provided on the inside of the back panel 166'.

The middle back panels 176 are of similar construction and comprise side flanges 188 with slots 180 through which the back panels 176 are secured to the side walls 12 and 14 through conventional screws (not shown). The back panels 176 also have a rolled top flange 182 and a rolled bottom flange 184. As illustrated in the drawing, the top and bottom flanges of adjacent panels are in abutting relationship with each other.

An electrical energy supply assembly 190 is secured to one of the back panels 176. The energy supply assembly has several convenience outlets 192 and is supplied with electrical energy through a wire 194.

Referring now to Figure 4, there is shown a modified form of the invention in which the back panel 166 has been removed and an extender panel 200 has been secured to the back portion of the video display panel 112 through straps 202 on the underside thereof and conventional screws (not shown). A retainer bar 204 extends upwardly from the back portion of the extender panel 200. The extender panel 200 can be used when a large CRT unit is used.

Referring now to Figure 5, there is shown a foot-rest pad which is an optional accessory for the invention. A bar 208 extends between the side walls 12 and 14 and is secured thereto through a connection similar to the connection of the support tube assembly 148. A foot-rest pad 210 has a C-shaped clamp 212 secured to a bottom surface thereof for clamping engagement with the bar 208.

The invention provides for a simply constructed and easily assembled VDT stand in which a keyboard sur-

face is adjustable vertically as well as with a pitch and a video display surface assembly is likewise adjustable vertically and for pitch. The adjustments are made simply and easily in a simply mechanical manner and can easily be made by an operator.

Whereas the invention has been described with reference to a keyboard surface assembly having journals which engage slots in the side walls, it is within the scope of the invention to reverse the parts and mount bushings on the side walls and have slots in depending brackets on the keyboard surface. Likewise, the bushings on the video display panel assembly can be interchanged with the support plates 24, 26 without departing from the scope of the invention.

Reasonable variation and modification are possible within the scope of the foregoing disclosure, the drawings and the appended claims without departing from the spirit of the invention.

C L A I M S

1. A video display terminal stand for supporting a video display and a separate keyboard, the stand comprising:

a pair of side walls rigidly joined together in spaced-apart relationship;
a video display support panel for supporting a video display;
means for mounting the video display support panel to the side walls for independent vertical and tilt adjustment of the video display support panel with respect to the side walls;
a keyboard panel for supporting a keyboard;
means for mounting the keyboard panel to the side walls to provide independent vertical and tilt adjustment of the keyboard panel with respect to the side walls;
whereby both the keyboard panel and the video display panel can be adjusted independently of each other and both vertically and for tilt convenience of the user.

2. A video display terminal stand according to claim 1 wherein the keyboard panel mounting means comprises:

a bracket mounted to the keyboard panel and depending therefrom;
vertically elongated slots mounted in one of the inside surface of the side wall and the bracket, fingers projecting into the slots and forming bushing-receiving coves therebetween; and

a pair of bushings mounted on the other of the inside surface of each side wall and the bracket for engagement with the coves.

3. A video display terminal stand according to claim 2 wherein the video display support surface mounting means comprises two sets of vertically spaced receiving means on the side surface of the side walls;
first support means for engaging one set of receiving means; and
second support means independent of the first support means for engaging the second set of receiving means.

4. A video display terminal stand according to claim 1 wherein said video display support surface mounting means comprises two sets of vertically spaced receiving means on the inside surface of the side walls;
a first support means for engaging one set of the receiving means; and
second support means independent of the first support means for engaging the second set of receiving means.

5. A video display terminal stand according to claim 4 wherein said receiving means are holes, said support means comprise bushings which extend into said holes.

6. A video display stand according to claim 5 wherein at least one of each set of bushings is retractable to facilitate removal of the first and second support means and repositioning the same in different ones of said receiving means.

7. A video display stand according to claim 6 wherein one set of the support means is secured to the video display support surface and another set of the support means is independent of the video display support surface.

8. A video display stand according to claim 7 and further comprising a back wall including a plurality of separate panels removably joined to the side walls.

9. A video display stand according to claim 8 wherein the video display surface extends rearwardly and beyond the back wall.

10. A video display terminal stand for supporting a video display and a separate keyboard, the stand comprising:

a pair of side walls rigidly joined together in spaced-apart relationship;
a keyboard support surface for supporting a keyboard;
means for mounting said keyboard support surface to said side walls for vertical adjustment with respect thereto;
a video display support surface for supporting a video display;
two sets of vertically spaced receiving means on the inside surfaces of each of the side walls;
first support means for said video display surface for engaging one set of said receiving means on each side wall;
second support means independent of said first support means for said video display support surface for en-

gaging another set of said receiving means on each side wall;

whereby said video display support surface is vertically adjustable and tiltably adjustable independently of said keyboard support surface.

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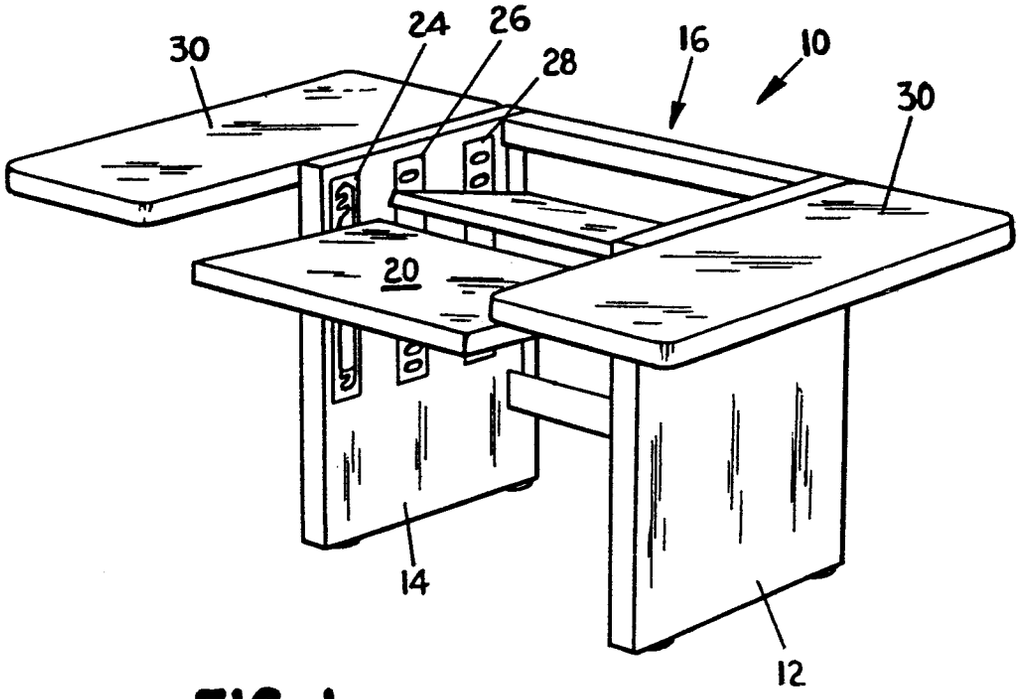

FIG. 1

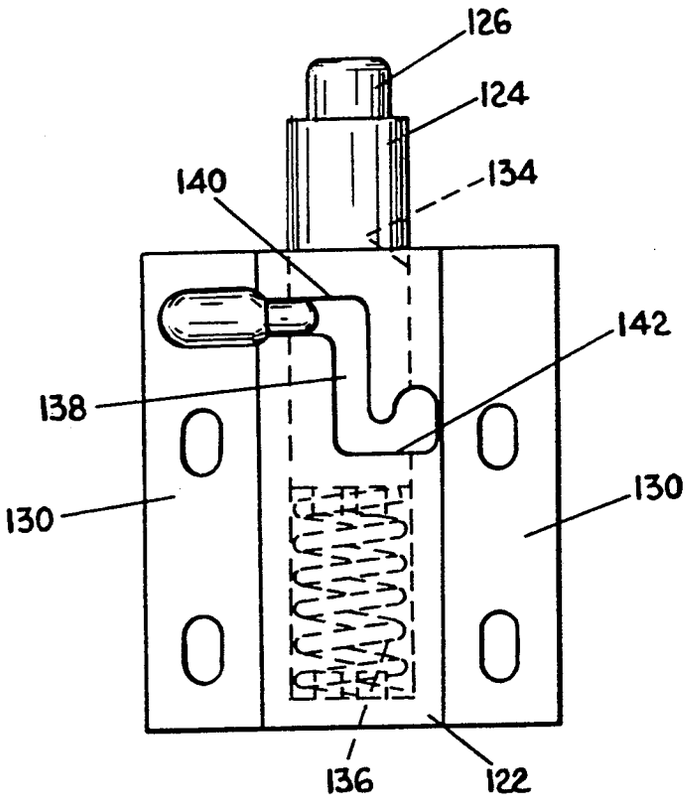

FIG. 3

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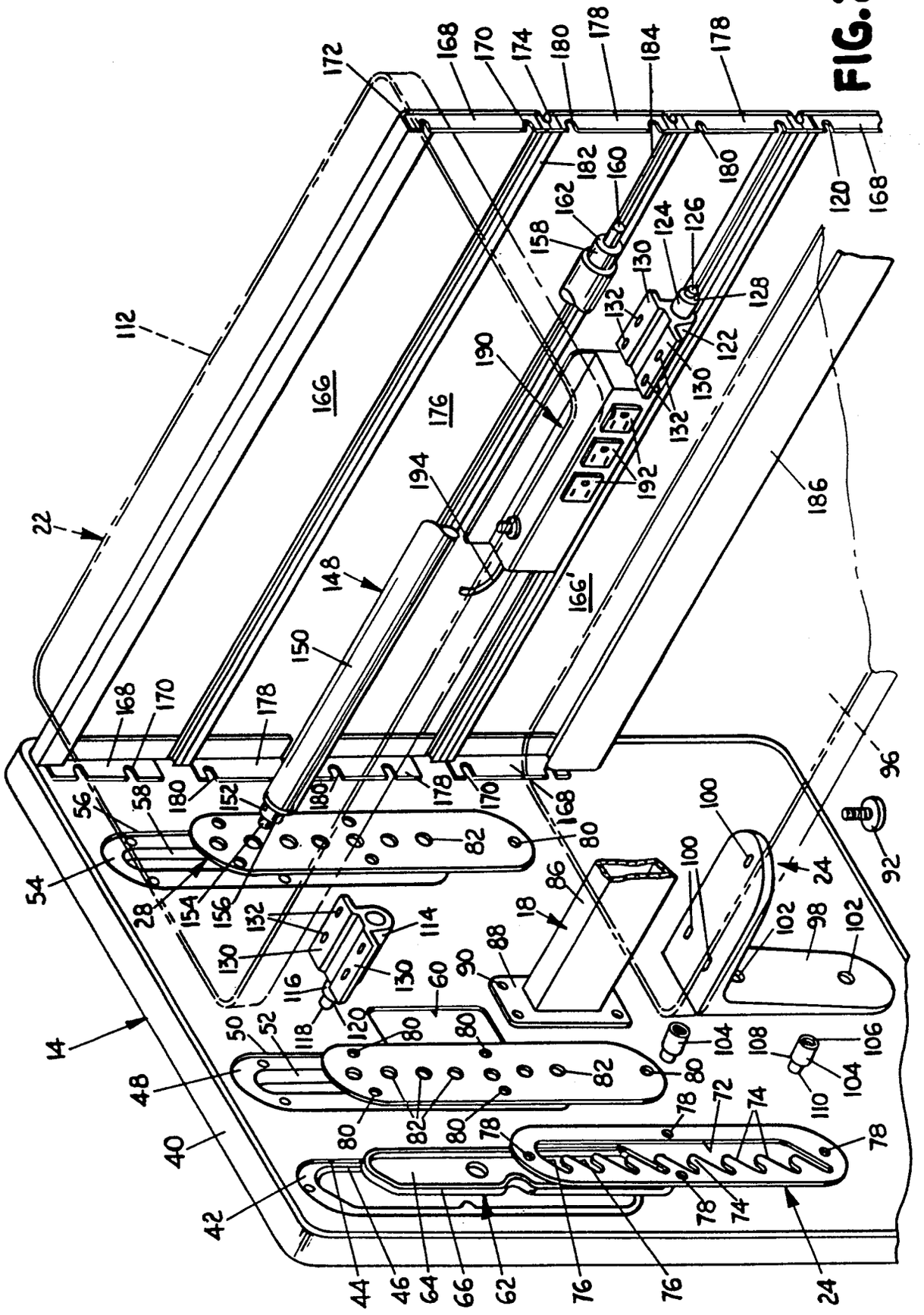

FIG.2

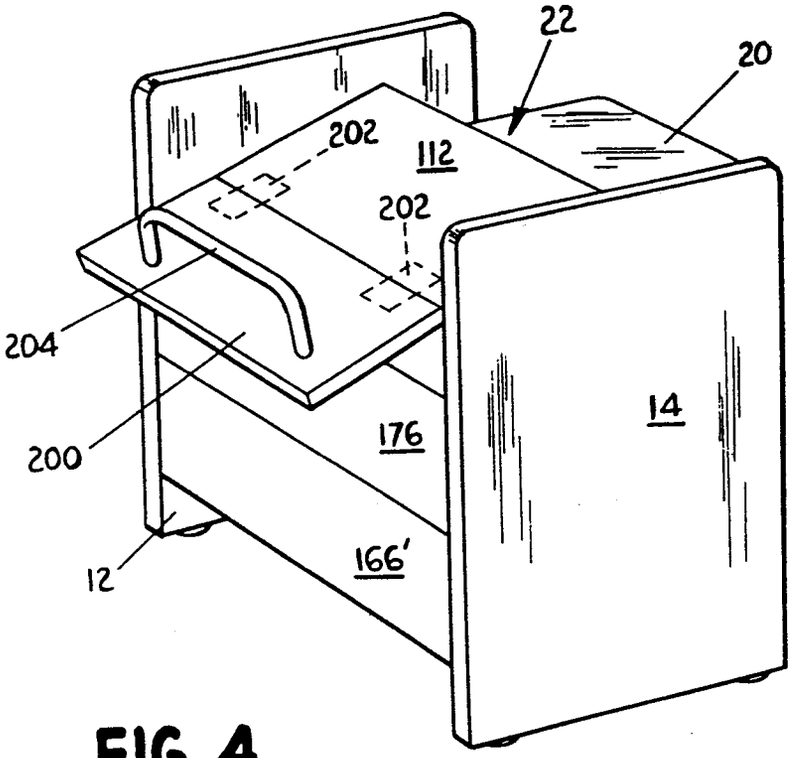

FIG. 4

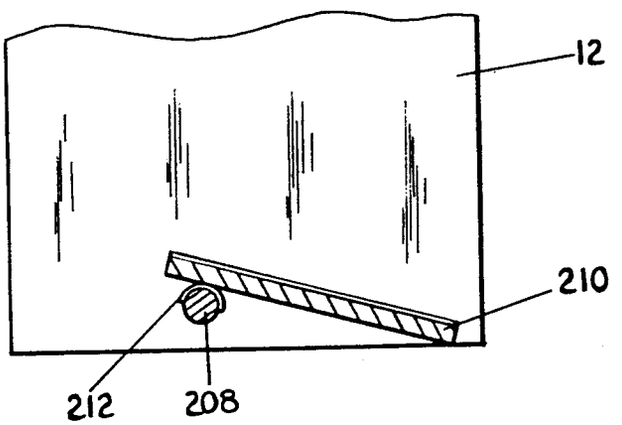

FIG. 5