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(71) Demandeur/Applicant:
GRIFFIN, JOSEPH EDWARD, IE

(72) Inventeur/Inventor:
GRIFFIN, JOSEPH EDWARD, IE

(74) Agent: GOWLING LAFLEUR HENDERSON LLP

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(54) Title: AN ERGONOMIC MONITOR SUPPORT DEVICE

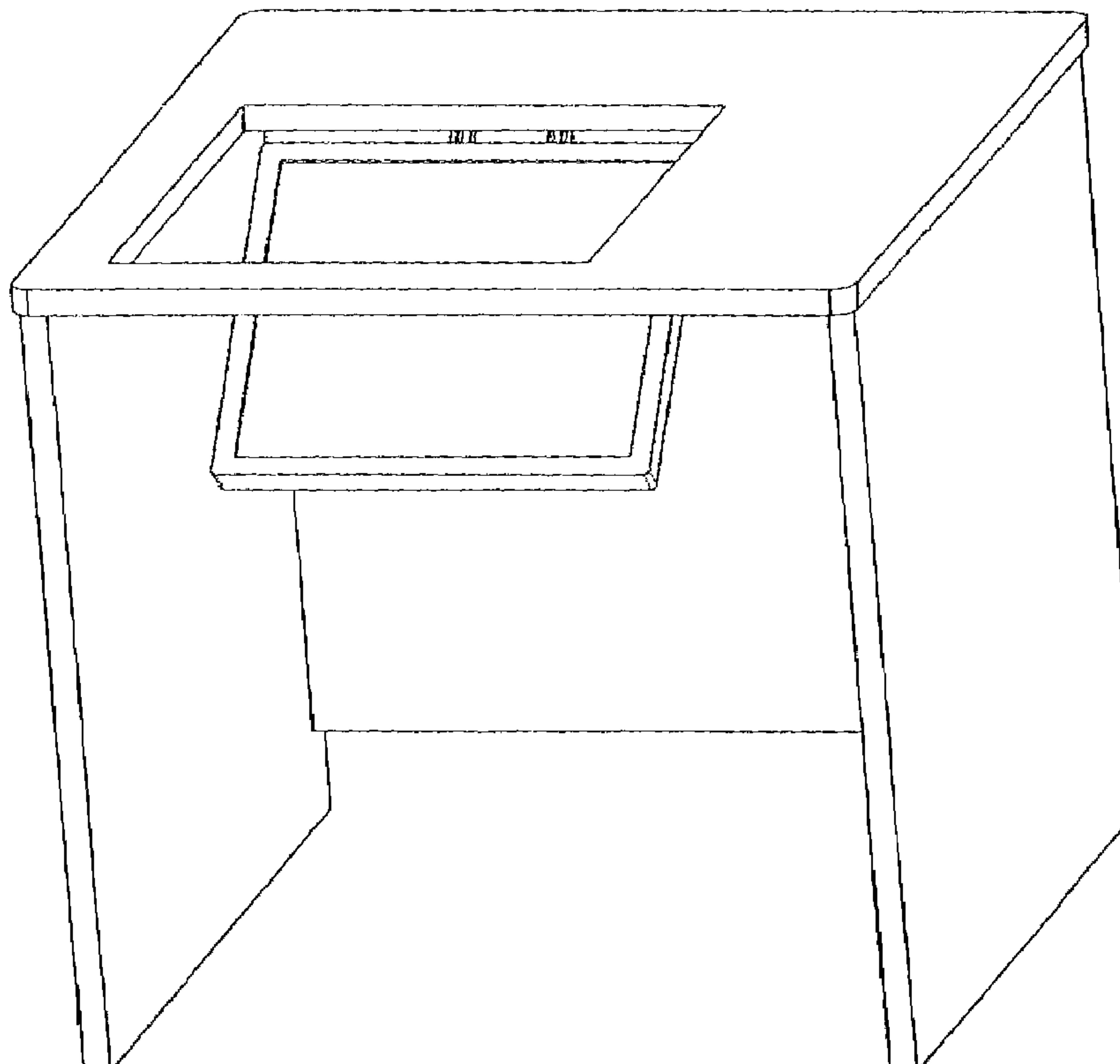
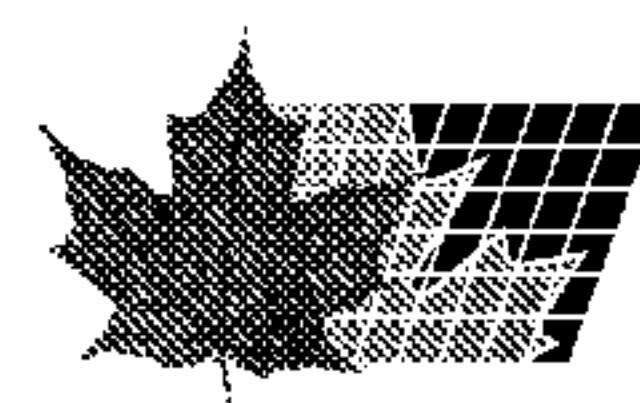


FIG. 1

(57) Abrégé/Abstract:

An monitor support device incorporating a desk attachment and monitor mounting means enabling a monitor to be mounted at least partially beneath an aperture in a desktop so as to be viewable through said aperture.



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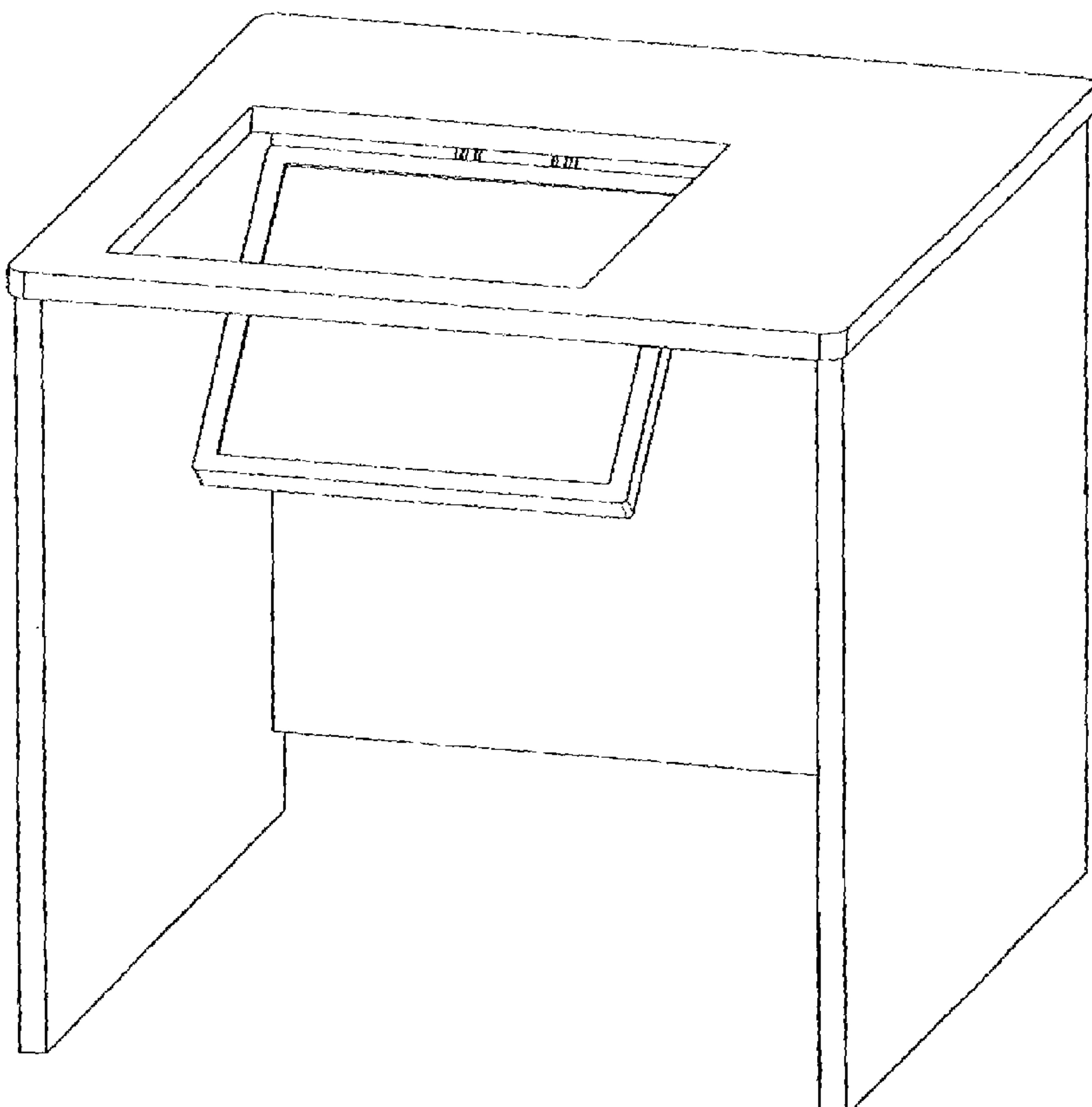
(71) Applicant and

(72) Inventor: GRIFFIN, JOSEPH EDWARD [—/IE];
Blackhall Little, Kilcloon, Co. Meath (IE).(74) Agent: CATESBY, Olivia Joanne; Tomkins & Co., 5
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(54) Title: AN ERGONOMIC MONITOR SUPPORT DEVICE



(57) Abstract: An monitor support device incorporating a desk attachment and monitor mounting means enabling a monitor to be mounted at least partially beneath an aperture in a desktop so as to be viewable through said aperture.

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FIG. 1

Title

An ergonomic monitor support device.

Field of the Invention

5 The present invention relates to supporting monitors, including VDUs, television and video monitors and notebook and laptop computers. In particular, the present invention is related to a universal standards based adjustable ergonomic monitor support/security device designed to house at least part of a monitor beneath the surface of a desk or worktop and present it at the optimum viewing angle and distance to the user.

10

Background to the Invention

Computer displays and monitors have traditionally been mounted on the surface of a desk or work station, and are typically positioned either at eye level or within 10 to 20 degrees below horizontal eye level. The accompanying mouse and keyboard are 15 traditionally also located and used on the desk surface. However, it has been found that these arrangements are ergonomically sub-optimal. Neck, shoulder and eye strain can occur with use of such arrangements over an extended period. The most naturally comfortable position to review material, such as reading material or information displayed on a VDU is looking down at an angle of between 10 degrees and 40 degrees 20 from the horizontal from a distance of between 600 and 900mm (ISO11064 Part 4:2004). The eyes naturally accommodate this with minimal head movement. The current practice of mounting monitors on desks can cause undue stress and strain on the neck, shoulders and eyes. Touch typists in particular regularly switch their line of sight 25 between a keyboard, working papers and the screen. It is desirable to have all three of these views to fall within a single plane or line of sight.

Initial attempts to overcome these problems ameliorated some of the drawbacks, but still required the user to look up at the screen. For example, lowering the desk height to accommodate the keyboard and mouse resulted in the desktop being too low for 30 comfortable use, writing, reading, etc.

For example, DE4240349 discloses an ergonomically efficient keyboard for use with computer terminals, wherein the keyboard is set beneath the level of the surface of a

work desk on which the computer monitor is located. A problem with this arrangement is that the keyboard is not at the correct height for optimal typing and the viewing angle of the VDU is not addressed.

5 There are a number of solutions to the problem that rely on embedding the monitor or display within the desk.

US5120117 relates to a preformed platform for assembly into a cut-out section of a work table or counter to support a computer keyboard and monitor according to
10 accepted ergonomic principles. The base of the keyboard is supported at a level below the ordinary desk height so as to allow typing to be done with the wrists substantially level and straight. A wrist support bar is provided to support the wrists and reduce wrist strain. The monitor and the keyboard are positioned with their operative centres at similar heights from the floor and at similar distances from the operator for optimum
15 operator comfort and efficiency. This system is limited for use and security with CRT monitors. Furthermore, an additional problem with this system is that if the monitor is moved and/or changed, the critical angle may not be reset, as the system does not offer a full range of adjustments. The working desk height is also difficult to achieve, and the system cannot be retrofitted to a desk.

20

DE4225662 discloses a work desk with a frame that supports a main desk panel and at the rear is an upstand that has a glass front panel. Within the main body of the upstand is a computer monitor that is supported on a carriage. The carriage is mounted on a vertical column that allows the height and angle of inclination to be adjusted. The
25 carriage may also be positioned horizontally by moving along a guide that consists of two profiled section rails. This system is limited to use with CRT monitors and requires a large and cumbersome purpose built desk. Furthermore, the monitor screen remains positioned substantially on top of the working surface of the desk, and could easily be used at the wrong angle.

30

FR2774571 discloses an arrangement where the computer monitor is held under the work surface by a support made of fabric. The sides of this are fixed to tubular frames that are articulated on two bars that are fixed under the work surface. One frame is held

in slots in the back of the bars and the other frame is held in hooks in the front of the bars. A problem with this arrangement is that the fabric does not allow for air circulation, and as a result, overheating of the computer monitor may occur.

Furthermore, the fabric is not designed to securely hold the monitor at any particular or 5 correct angle. Again, this arrangement is limited to use with CRT monitors. It is well known that a health and safety aspect is involved with the lifting of CRT monitor which are heavy in weight. Retrofitting is not possible with this system either.

CH686022 discloses a desk with a number of different support surfaces for receiving the 10 various components of a personal computer, e.g. the keyboard, the monitor and the processor. The monitor is supported by a surface which is angled rearwards and downwards, behind the front support surface for the computer keyboard, so that the monitor screen is visible to the keyboard operator without further movement of the head. However, the arrangement requires that the desk surface be interrupted to 15 accommodate the top of the monitor. The resultant loss of available work space on the desk surface is undesirable. Furthermore, the system is not adaptable for use with varying monitor sizes or types. Further problems include its unsuitability for retrofitting and poor security.

20 US4,207,405 and US 6,796,536, as well as US registered designs Des 430,165, Des430,570, and US design application 29/205,730 all relate to free-standing supports suitable for supporting a monitor at an angle.

Summary of the Invention

25 According to the invention there is provided an monitor support device incorporating a desk attachment and monitor mounting means enabling a monitor to be mounted at least partially beneath an aperture in a desktop so as to be viewable through said aperture.

30 The monitor support device of the invention may be used with specially designed desks or worktops or may be easily, quickly and securely retrofitted to existing desks, worktops, tables, workstations or the like. The ease and speed at which the device can be fitted to any desk or the like is one of the many advantages of the invention. Once

fitted, the device enables a monitor to be mounted securely and quickly. It is very easy for a monitor to be both mounted on and removed from the device. It is also possible to securely lock a monitor to the device, which is a big advantage in terms of security.

5 The monitor mounting means is preferably adapted to position a monitor mounted thereon at a fixed predetermined angle relative to the desktop.

Preferably the desk attachment is mountable on the underside of a desktop or on the back wall of a desk.

10

The monitor mounting means enables a monitor to be securely mounted to a desk.

According to at least one embodiment of the invention the monitor mounting means comprises a monitor bracket for supporting a monitor, and a spacer arm member for 15 maintaining the monitor at said fixed angle, wherein said monitor bracket is releasably engageable to said spacer arm member. Preferably the spacer arm member comprises means for attachment to said desk attachment.

The monitor support device preferably further comprises fastening means for releasably 20 fixing said monitor bracket to said spacer arm member. The monitor bracket may comprise at least one bolthole and said fastening means may be bolts. Preferably, the spacer arm member comprises at least one elongate slot along its longitudinal axis through which a bolt may be received to secure said monitor bracket onto said spacer arm member.

25

Preferably the monitor bracket comprises at least two bolt holes and said spacer arm member comprises at least one pair of parallel elongate slots, said elongate slots having a relative spacing matching that of the bolt holes of the monitor bracket to enable a pair of bolt holes to cooperate with a pair of elongate slots.

30

Preferably the space arm member permits a translation of a monitor mounted thereon relative to the desk, the translation having a horizontal component and a vertical

component. It will be appreciated that said translation enables a monitor to be fully or partially submerged beneath a desktop.

According to one aspect of the invention, the monitor bracket is adapted for attachment 5 to a flat panel monitor. The monitor bracket may be adaptable to fit any size of flat panel monitor. The monitor bracket may comprise means for attachment to the back of a flat panel monitor. Preferably the means for attachment to the back of a flat panel monitor is adapted to be cooperate with standard mounting arrangements found on the back of standard flat panel monitors. The means for attachment to the back of a flat 10 panel monitor preferably comprises a substantially X-shaped plate receivable into a square or rectangular recess in the back of a flat panel monitor. Preferably the substantially X-shaped plate has four corner extensions, each extension having a frangible removable end portion, the removal of which decreases the size of the X-shape plate. Preferably each corner extension is provided with a bolt hole for cooperation with 15 a corresponding bolt hole on the back of a flat panel monitor.

In addition to the X-shaped plate, the flat panel monitor bracket preferably further comprises a spacer arm engaging plate incorporating the monitor bracket's bolt holes for cooperation with a pair of elongate slots in the spacer arm member.

20

Preferably the X-shaped plate is attachable to a monitor when in any orientation. This allows the spacer arm engaging plate to protrude from the base, side or top of the monitor. It will be appreciated that each orientation of the spacer arm engaging plate results in a different position of the monitor relative to the spacer arm member, and 25 subsequently to the desk attachment. This allows the monitor to remain centrally positioned under or through the desk aperture irrespective of the position of the desk attachment relative to the aperture.

According to another aspect of the invention, the monitor bracket is a laptop computer 30 cradle. Preferably said lap top computer cradle comprises a base portion for supporting the base of a laptop and a rear portion for supporting the screen portion of a laptop in its open configuration. The base portion of the cradle may comprise an external raised lip to securely maintain a laptop on the base portion. Preferably the lap top computer cradle

comprises at least one ventilation hole. The lap top computer cradle may comprise at least one cable aperture to accommodate at least one laptop cable. The lap top computer cradle may be adapted to receive a laptop security strap.

5 In this embodiment, the bracket's bolt holes for cooperation with a pair of elongate slots in the spacer arm member are provided in the rear portion (back plate) of the cradle.

The invention further provides a desk adapted for use with the monitor support device of the invention, the desk comprising a desktop. The desk may be any size. The desk 10 preferably comprises an aperture in its desktop through which a monitor mounted within the monitor support device is visible. Preferably said aperture comprises at least one removable pane of clear glass. The glass is preferably reinforced.

Alternatively the aperture may comprise at least one removable opaque panel.

15 The desk may be adapted for a left or right-handed user, wherein an aperture is provided either on the left or right side of the desk.

In alternative embodiments, the entire desk surface may be clear to enable the user to 20 view a monitor mounted thereunder. A glass or clear plastic such as PerspexTM surface may be used. There may be an aperture in this surface to enable a monitor to be semi-submerged.

25 Preferably the desk further comprises a slidable keyboard tray mounted beneath the desktop. The keyboard tray enables a keyboard to be positioned below the desk surface. The keyboard tray preferably is provided with an adjustable mounting system such as slide rails for mounting the keyboard tray beneath the desktop. Preferably the keyboard tray is height adjustable relative to the desktop. Further still, the keyboard tray is preferably slidable towards and away from the desk to achieve a optimum typing 30 position for the user. In accordance with one embodiment of desk, the keyboard tray is approximately 711mm in length, 254mm in width, with a thickness of approximately 18mm. An ant-eject system may be provided for the keyboard tray.

The desk may further comprise a central processing unit, CPU, bracket for supporting a CPU. The bracket may be adjustable. The adjustable CPU may be attachable to one of the side panels of the desk and comprise a base portion on which the CPU sits. The bracket may take the form of a shelf, holding the CPU a short distance off the 5 underlying floor. The bracket is preferably adjustable to accommodate different sizes of CPU.

Locking means may also be provided for locking the monitor to the monitor support and/or desk assembly.

10

A monitor security strap may additionally be provided to support a monitor relative to the desk. The strap is preferably secured at each end to the underside of the desk adjacent each side of the aperture. The central portion of the strap preferably passes between the rear of the monitor and the monitor bracket. The monitor security strap 15 provides additional support for the monitor and is particularly useful with heavy monitors.

The desk may be static or may alternatively be movable. The desk preferably comprises at least two wheels for movement of the desk, to enable the desk to be rolled across an 20 underlying surface. In one embodiment, wheels are provided only at the rear of the desk so that the desk may be moved by slightly raising the front of the desk (adjacent the user) while manoeuvring the desk into position. The wheels may be provided on a frame on which the desk sits. Four wheels may be provided on such a frame. The wheels are preferably heavy duty wheels. Locking means may be provided on the wheels.

25

A lockable security panel may also be provided for the front of the desk to prevent unauthorised access to the underside of the desk.

Anti-reflection means such as an anti-reflection hood may further be provided.

30

The invention further provides a kit incorporating a monitor support device according to the invention. The kit may also comprise fixtures and fittings required to fit the device to a desk or similar structure. It will be appreciated that the monitor support device may

be retrofitted to any desk-like structure or may be used with a pre-prepared desk or desk-like structure.

The monitor support device of the invention may be provided with an adapted desktop
5 alone, a desktop and set of legs, or with mobile desking or desk modules. If existing desks are too low, risers may be used to raise the desktop.

Brief Description of the Drawings

10 The invention will now be described with reference to the accompanying drawings in which:

Figure 1 depicts a desk incorporating one embodiment of monitor support device of the invention, with a monitor in a fully submerged position beneath the desk.

15 Figure 2 is a side view of the desk of figure 1 showing the monitor support device in use on the underside of the desk.

Figure 3 is a base view of the desk of figure 1.

Figure 4 depicts the monitor support device from the desk in figures 1 to 3 with its monitor support inverted.

20 Figure 5 depicts the monitor support device of figure 4 with its monitor support in an uppermost position.

Figure 6 depicts a desk incorporating the monitor support device of figure 5, with a monitor semi submerged through a hole in the desk.

Figure 7 is a perspective view of the desk of figure 6.

Figure 8 depicts a desk attachment according to one embodiment of the invention.

25 Figure 9 depicts the underside of the desk attachment of figure 8.

Figure 10 depicts an spacer arm member according to one embodiment of the invention.

Figure 11 depicts the underside of the desk attachment of figure 10.

Figure 12 depicts a monitor support device according to one embodiment of the invention.

30 Figure 13 depicts the underside of the monitor support device of figure 12.

Figure 14 depicts the monitor support device of figure 4 in a further set up with its monitor support in a sideways orientation.

Figure 15 depicts the support of figure 14 with its monitor support inverted.

Figure 16 depicts an alternative embodiment of monitor support device adapted to support a lap top computer in its open configuration.

Figure 17 is a reverse view of the monitor support device of figure 16.

Figure 18 is a front perspective view of the laptop cradle of figure 16.

5 Figure 19 is a back perspective view of the laptop cradle of figure 16.

Figure 20 is an alternative embodiment of monitor support device of the invention for attachment to a rear wall of a desk.

Figure 21 depicts an alternative embodiment of spacer arm member according to one embodiment of the invention.

10

Detailed Description of the Drawings

The present invention provides an adjustable ergonomic monitor support device adapted to house a monitor securely and at the correct angle beneath the surface of a desk.

15 Figure 1 shows a desk incorporating a monitor support device according to the invention. As shown, the monitor support device allows a monitor, in this case a flat panel monitor, to be supported beneath the working surface of a desk, the screen of the monitor being visible through an aperture provided in the desk's upper surface. The monitor support device enables the monitor to be presented at the optimum viewing 20 angle and distance for the user.

As shown in Figures 2 and 3, the monitor support device has a desk attachment 10 shown affixed to the underside of the desk, a monitor bracket shown affixed to the back of a monitor, and a third component, a spacer arm member linking the desk attachment 25 and the monitor bracket. The resultant monitor support device combination permits the monitor to be in effect suspended and locked beneath the desktop.

Figure 4 shows the assembled support arrangement from Figure 2 in greater detail. Desk attachment 10 is securable to the underside of a desktop by way of screw holes 13. 30 Spacer arm member 20 comprises a desk mounting plate 21 connected to an inclined slotted plate 22. The desk mounting plate 21 is slidably receivable within desk attachment 10 by way of corresponding flanges 15 on the underside of desk attachment

10. Finally, monitor bracket 30 is a flat panel monitor bracket having a spacer arm-engaging plate 31 connected to a monitor mount 33 via an intermediate portion 32.

Mating bolts (not shown) are used to releasably but securely couple the spacer arm-engaging plate 31 to inclined slotted plate 22 by threading the mating bolts through screw holes 34 and two of the slots provided in the inclined slotted plate 22. In the arrangement shown in figure 3, the two inner slots 19 are used, resulting in the monitor bracket 30 being centrally orientated relative to the inclined slotted plate 22. As mentioned below, the multiple slots in the inclined slotted plate 22 may be used in alternative combinations to alter the position of the monitor bracket 30 relative to the inclined slotted plate 22.

It will be noted that the position of the monitor bracket 30 in figure 4 differs slightly from its position in figure 2. This is to show that the monitor bracket may be rotated through 180 degrees and re-secured to part 22 using the same screw-hole 34 and slots 29 combination. This arrangement allows the monitor mount portion 33 to sit higher than the spacer arm-engaging plate 31. The provision of the slots 19 allows the whole monitor bracket to slide the length of the elongate support plate 20 to reach a desired position for a monitor secured thereto. As shown in figure 5, by orientating the monitor bracket with the monitor mount 33 up most, the highest possible position for a monitor is achieved, in which the monitor would protrude through the hole in the desk. This is shown clearly in figures 6 and 7.

Figures 8 and 9 show a desk attachment 10 according to one embodiment of the invention. The desk attachment 10 comprise a substantially planar base plate 11 formed by a substantially quadrilateral plate. A pair of corners 12 extend from opposite sides of the side of the base plate 11, forming a substantially H-shape. The corners 12 are each provided with a screw hole 13. The screw holes 13 are used to affix the desk attachment 10 to the underside, or as discussed later the inner wall, of a desk. The base plate 11 is also provided with a substantially straight ventral slot 14. As best seen in figure 9, a pair of curved flanges 15 are set on opposing sides of the base plate 11 and disposed substantially parallel to each other. The curved flanges 15 provide between them a support groove 16 to receive plate 21 of spacer arm member 20, described below.

Spacer arm member 20 is shown in full in figure 10 to comprise a desk mounting plate 21 connected to a inclined slotted plate 22. The desk mounting plate is substantially quadrilateral and comprises two side edges 23 substantially parallel to each other and an 5 end edge 24 substantially parallel to a connecting edge 25, which in turn connects the desk mounting plate 21 to the inclined slotted plate 22 via an angled portion 27. The desk mounting plate 21 contains a threaded bolt hole 26 centrally located with respect to the side edges 23 and located close to the end edge 24. The desk mounting plate 21 is substantially equal in width to the distance between the two flanges 15, so as to enable 10 the desk mounting plate 21 to slide between the flanges. In use, the spacer arm member 20 can be affixed to the desk attachment 10 by means of a screw or bolt (not shown) through the bolt hole 23 and through the ventral slot 14. The ventral slot 14 allows the position of the spacer arm member 20 to be adjusted relative to the desk attachment 10 when installing. Once installed, the position of the monitor is fixed. The bolt may then 15 be further secured to the desk (especially if the desk is wooden). This provides security in the event of an attempt to remove the monitor from the desk.

The desk mounting plate 21 is connected to the inclined slotted plate 22 by an angled portion 27. The angle between the desk mounting plate and slotted plate is desirably 20 approximately 135 degrees. The angle is fixed to ensure that the most desirable viewing angle (of between 10 and 40 degrees from the horizontal) of the user to the screen of the monitor is achieved.

The inclined slotted plate 22 comprises is an elongate rectangular shaped plate with five 25 substantially parallel slots running along most of its length. The slots comprise an outer pair 28, each located proximal to the edge of the inclined slotted plate 22, an inner pair 29, each located proximal to the centre of the inclined slotted plate 22, and a central slot 40. The outer pair 28 are spaced apart in a parallel relationship approximately 100 mm apart. The inner pair 29 are in spaced apart parallel relationship approximately 70 mm 30 apart. The dimensions are chosen to be mate-able with the Video Electronics Standards Association (VESA) standards, such as the Flat Display Mounting Interface (FDMI). This is a VESA standard for mounting flat panel monitors, and other displays. The FDMI standard is also referred to as VESA mount.

As shown in detail in figures 12 and 13, monitor bracket 30 comprises a spacer arm-engaging plate 31 connected to a monitor mount 33 via an intermediate portion 32. The spacer arm-engaging plate 31 comprises a substantially planar quadrilateral plate with a series of screw holes 34. The spacer arm-engaging plate 31 comprises a substantially rectangular plate; the intermediate portion 32 being connected at one of the short sides of the rectangle. The intermediate portion 32 has a substantially S-shaped cross-section to enable the maintain spacer arm-engaging plate 31 substantially parallel to, but spaced apart and offset from, the plane of the monitor mount 33. The monitor mount 33 extends from the intermediate portion 32 in a direction away from the spacer arm-engaging plate 31. The monitor bracket may therefore be said to comprise a dogleg profile.

Mating bolts (not shown) are used to affix the spacer arm-engaging plate 31 to the inclined slotted plate 22 by threading the mating bolts through the screw holes 34 and slots 28, 29, 40. The monitor mount 33 is of substantially cruciform shape. Each cruciform arm 35 is provided with a first monitor attachment point 38 and a second monitor attachment point 39 in the form of screw holes. The first and second monitor attachment points 38, 39 are separated from each other by a frangible portion 37 of the cruciform arm 35. A weakened neck 37a is formed by way of indentations on each edge of the arms 35, together with an elongate slot 37b between each indentation. These features enable the frangible portion 37 to be easily snapped off the rest of its arm, preferably by hand.

In one embodiment of the invention the full sized X-shaped monitor mount may be dimension for use with a VESA 100 monitor. The frangible portion 37 permits the user to snap off the second monitor attachment portions 36 to suit a monitor having a lower VESA specification, such as VESA 70 or VESA 75.

It will be appreciated that the length of intermediate portion 32 is chosen to keep the planes of parts 31 and 33 sufficiently far away from one another so as to allow the monitor support fit different sizes and shapes of flat panel monitor. One skilled in the art will be aware that the backs of many flat panel monitors are provided with a shallow square or rectangular recess into which a mounting support may be received. Portion 33

is designed to be received into any such recess if required, wherein intermediate portion 32 extends out of the recess to keep part 31 clear of the monitor housing.

As mentioned above, holes 34 in the flat plate section 31 are used to secure component 5 30 to the inclined slotted plate 22. This fitting allows the monitor to be moved up and down the support plate to accommodate different sizes of flat panel monitors (FPM) and to be inverted to allow the FPM to appear above the worktop/desk level as shown in figures 4 to 7.

10 With reference to figures 14 and 15, it is shown that the provision of a central slot 40 in angled support 22 also allows flat plate 31 to be rotated through 90 degrees and secured to the spacer arm member to allow a monitor to be positioned either side of the spacer arm member's central longitudinal axis. In such arrangements, intermediate portion 32 would be adjacent one side of the monitor rather than adjacent its base (as in Figure 6) 15 or adjacent its top (as in figure 2).

In addition to its use with flat-panel monitors, the monitor support device of the invention is also suitable for use with laptop computers. Figure 16 shows a laptop version of the assembly. In this assembly, monitor bracket 30 has been replaced by a 20 laptop support 50. Laptop support 50 follows the shape of an open laptop, with two substantially rectangular faces linked along one of their longer edges. The angle between the two faces is shown to be just greater than a right angle, although alternative angles could be provided. In this embodiment, laptop support 50 would have started out as a single substantially rectangular sheet of metal or hard plastic and been folded about 25 its central axis, although in alternative embodiments the laptop support may comprise any number of parts joined together to provide the required shape.

As seen in figures 18 and 19, laptop support 50 comprises a laptop receiving base plate 51 and a back plate 52. Back plate 52 is provided with holes 57 identical in shape and 30 relative position to the holes 34 provided in monitor mount 33. Accordingly, holes 57 enable backplate 52 and hence laptop support 50 to be mounted on the inclined slotted plate 22 of spacer arm member portion 20. Again it will be appreciated than either slot pair 18 may be utilised to centre the laptop support, or alternatively central slot 40 may

be used in combination with one of slots 18 to position the laptop support either side of inclined slotted plate 22.

As best seen from Figure 17, the laptop receiving base plate 51 is provided with a series 5 of ventilation holes/slits 56 to provide ventilation and air circulation for a laptop positioned thereon. It is well known in the art that as with any electrical equipment, laptops generate a substantial amount of heat when powered on and a laptop's own ventilation holes are often located on around its base. The ventilation slits 56 ensure that a laptop located thereon does not overheat as a result of insufficient ventilation. The 10 ventilation holes or slits may take an alternative form in other embodiments. The base plate 51 is also provided with turned-up or rolled edges 53 to securely hold a lap top base within the laptop support to prevent it falling off. The rolled edges are angled so as to accommodate any size of laptop.

15 Referring again to figure 16, apertures 54 for wires are formed in the back plate 52 adjacent the backplate/base plate interface. The apertures 54 allow a laptop to remain plugged into the mains and/or to any other equipment while it is supported in the laptop support.

20 The side edges 58 of the backplate 52 have been rolled back to impart strength to the backplate. Strap holes 59 are provided towards the base of each side edge 58 to accommodate a security strap or straps (not shown) for securing a laptop to the laptop support. Security straps may also be provided for the flat panel monitor support.

25 In figures 2 and 6, the desk attachment is shown affixed to the underside of the desk. In alternative arrangements, desk attachment 10 may be fitted to a substantially vertical surface at the back of the desk. This would be desirable for a desk wherein less than the required 600mm of desktop is available behind the desk's aperture for attaching the desk attachment to the underside of the desktop.

30

Figure 20 shows how the monitor support device is adaptable for a desk connection of this sort. Monitor bracket 30 is secured to what would have been previously considered the "underside" of spacer arm member piece 20, with the previously-considered "upper"

face of the desk mounting plate 21 cooperating with the previously-considered “underside” of base plate 10. With base plate 21 secured to a vertical surface under and to the rear of the desk, a flat panel monitor may be mounted onto the monitor mount 33 at the correct height for a correct viewing angle.

5

When the monitor is full submerged beneath the desk, as seen in figure 1, a toughened glass panel may be used to fill the aperture enabling the total desktop to be used as a desk. A half panel can be inserted where the monitor is semi submerged as in figure 7. It may be desirable to have the monitor screen semi submerged where touch-screen

10 technology is being utilised.

If the screen is not being used, the entire aperture may be filled by one or multiple wood panels to provide a full desktop surface.

15 Figure 21 shows an alternative embodiment of spacer arm to that shown in Figures 10 and 11. Spacer arm member 220 is shown in figure 21 to also comprise a desk mounting plate 221 connected to a inclined slotted plate 222. The desk mounting plate 221 and inclined slotted plate 222 have the same form as desk mounting plate 21 and inclined slotted plate 22. In the embodiment shown in Figure 21, the angle of connection of plate 20 221 to plate 222 is different however.

The desk mounting plate 221 is still connected to the inclined slotted plate 222 by an angled portion 227, but the angle between the desk mounting plate and slotted plate is desirably approximately 45 degrees. This embodiment allows the spacer arm to be used 25 in conjunction with a desk attachment mounted to the underside of a short section of desk (such as region 250 in Figure 2). When used with spacer arm 220, the desk attachment would be reversed so as to enable the desk mounting plate 221 to slide into the desk attachment in a direction from the front/rear edge of the desk towards the desk aperture, resulting in the angled portion 227 resting at the front/rear edge of the desk.

30

The words “comprises/comprising” and the words “having/including” when used herein with reference to the present invention are used to specify the presence of stated

features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

The term “monitor” when used herein with reference to the present invention refers to
5 any type of monitor incorporating a screen, with or without VESA connections, including but not limited to a flat panel monitor, the monitor of a laptop computer or notebook computer, a television monitor or a video monitor.

The term “desk” when used herein with reference to the present invention refers to any
10 desk or desk-like structure including but not limited to tables, worktops, workstations or any other structure having a work surface supported by way of brackets, legs, panels or other support means. The term “desktop” when used herein with reference to the present invention refers to the surface of any desk or desk-like structure including but not limited to tables, worktops, workstations or any other similar structure.

15 It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in
20 any suitable sub-combination.

AMENDED CLAIMS

received by the International Bureau on 10 September 2008 (09.10.2008)

1. An monitor support device for mounting a monitor at least partially beneath an aperture in a desktop so as to be viewable through said aperture, the device comprising:
 - a) a spacer arm member comprising:
a desk-engaging plate fixable to the underside of a desktop, and
an elongate slotted plate extending at a fixed angle from the desk-mounting plate and comprising at least one pair of substantially parallel elongate slots; and
 - b) monitor-mounting means comprising a spacer arm engaging plate having at least two bolt holes through which of each a bolt may be received to secure said monitor mounting means to said elongate slotted plate of said spacer arm member;
wherein said at least one pair of elongate slots have a relative spacing matching that of the bolt holes to enable a pair of bolt holes to cooperate with a pair of elongate slots.
2. The monitor support device of claim 1 wherein the elongate slotted plate comprises:
an outer pair of substantially parallel elongate slots;
an inner pair of substantially parallel elongate slots; and
a central substantially parallel elongate slot.
3. The monitor support device of claim 1 or claim 2 further comprising fastening means for releasably fixing said monitor-mounting means to said spacer arm member.
4. The monitor support device of claim 3 wherein said fastening means are bolts.
5. The monitor support device of any preceding claim wherein the space arm member permits a translation of a monitor mounted thereon relative to the desk, the translation having a horizontal component and a vertical component.

6. The monitor support device of claim 5 wherein said translation enables a monitor to be fully or partially submerged beneath a desktop.
7. The monitor support device of any preceding claim wherein said monitor-mounting means is a monitor bracket adapted for attachment to a flat panel monitor.
8. The monitor support device of claim 7 wherein said monitor bracket is adaptable to fit any size of flat panel monitor.
9. The monitor support device of claim 7 or claim 8 wherein said monitor bracket comprises means for attachment to the back of a flat panel monitor.
10. The monitor support device of claim 9 wherein said means for attachment to the back of a flat panel monitor is adapted to cooperate with standard mounting arrangements found on the back of standard flat panel monitors.
11. The monitor support device of claim 9 or claim 10 wherein said means for attachment to the back of a flat panel monitor comprises a substantially X-shaped plate receivable into a square or rectangular recess in the back of a flat panel monitor.
12. The monitor support device of claim 11 wherein said substantially X-shaped plate has four corner extensions, each extension having a frangible removable end portion, the removal of which decreases the size of the X-shape plate.
13. The monitor support device of claim 12 wherein each corner extension is provided with a bolt hole for cooperation with a corresponding bolt hole on the back of a flat panel monitor.
14. The monitor support device of claim 1 wherein said monitor mounting means is a laptop computer cradle.

15. The monitor support device of claim 14 wherein said lap top computer cradle comprises a base portion for supporting the base of a laptop and a rear portion for supporting the screen portion of a laptop in its open configuration.
16. The monitor support device of claim 15 wherein said base portion comprises an external raised lip to securely maintain a laptop on the base portion.
17. The monitor support device of any of claims 14 to 16 wherein said lap top computer cradle comprises at least one ventilation hole.
18. The monitor support device of any of claims 14 to 17 wherein said lap top computer cradle comprises at least one cable aperture to accommodate at least one laptop cable.
19. The monitor support device of any of claims 14 to 18 wherein said lap top computer cradle is adapted to receive a laptop security strap.
20. The monitor support device of any preceding claim further comprising a desk attachment mountable on the underside of a desktop or on the back wall of a desk.
21. The monitor support device of claim 20 wherein said desk-engaging plate of said spacer arm member is slidably receivable into said desk attachment.
22. The monitor support device of claim 21 further comprising means for locking the position of said desk engaging plate partially or fully within said desk attachment.
23. The monitor support device of claim 22 wherein said means for locking comprises an elongate slot in said desk attachment, a corresponding bolt hole in the engaging plate and a bolt receivable through said slot and bolt hole to prevent relative movement between the desk attachment and the spacer arm.

24. An monitor support device incorporating a desk attachment and a monitor bracket enabling a monitor to be mounted at least partially beneath an aperture in a desktop so as to be viewable through said aperture, wherein said monitor bracket comprises a substantially X-shaped plate receivable into a square or rectangular recess in the back of a flat panel monitor; said substantially X-shaped plate having four corner extensions, each extension having a frangible removable end portion, the removal of which decreases the size of the X-shape plate.
25. An monitor support device incorporating a desk attachment mountable on the underside of a desktop or on the back wall of a desk; and monitor mounting means enabling a monitor to be mounted at least partially beneath an aperture in a desktop so as to be viewable through said aperture, said monitor mounting means comprising a desk engaging plate slidably receivable into said desk attachment, wherein an elongate slot in said desk attachment, and a corresponding bolt hole in the desk engaging plate allows a bolt to be received through said slot and bolt hole to prevent relative movement between the desk attachment and the spacer arm.
26. A desk adapted for use with the monitor support device of any preceding claim, the desk comprising a desktop having an aperture through which a monitor mounted within the monitor support device is visible.
27. The desk of claim 26 wherein said aperture comprises at least one removable pane of clear glass.
28. The desk of claim 27 wherein the glass is reinforced.
29. The desk of any of claims 26 to 28 wherein said aperture comprises at least one removable opaque panel.
30. The desk of any of claims 26 to 29 further comprising a slidable keyboard tray mounted beneath the desktop.

31. The desk of any of claims 26 to 30 further comprising at least two wheels for movement of the desk.
32. The desk of any of claims 26 to 31 further comprising a central processing unit, CPU, bracket for supporting a CPU.
33. A desk according to any of claims 26 to 32 incorporating a monitor support device according to any of claims 1 to 25.

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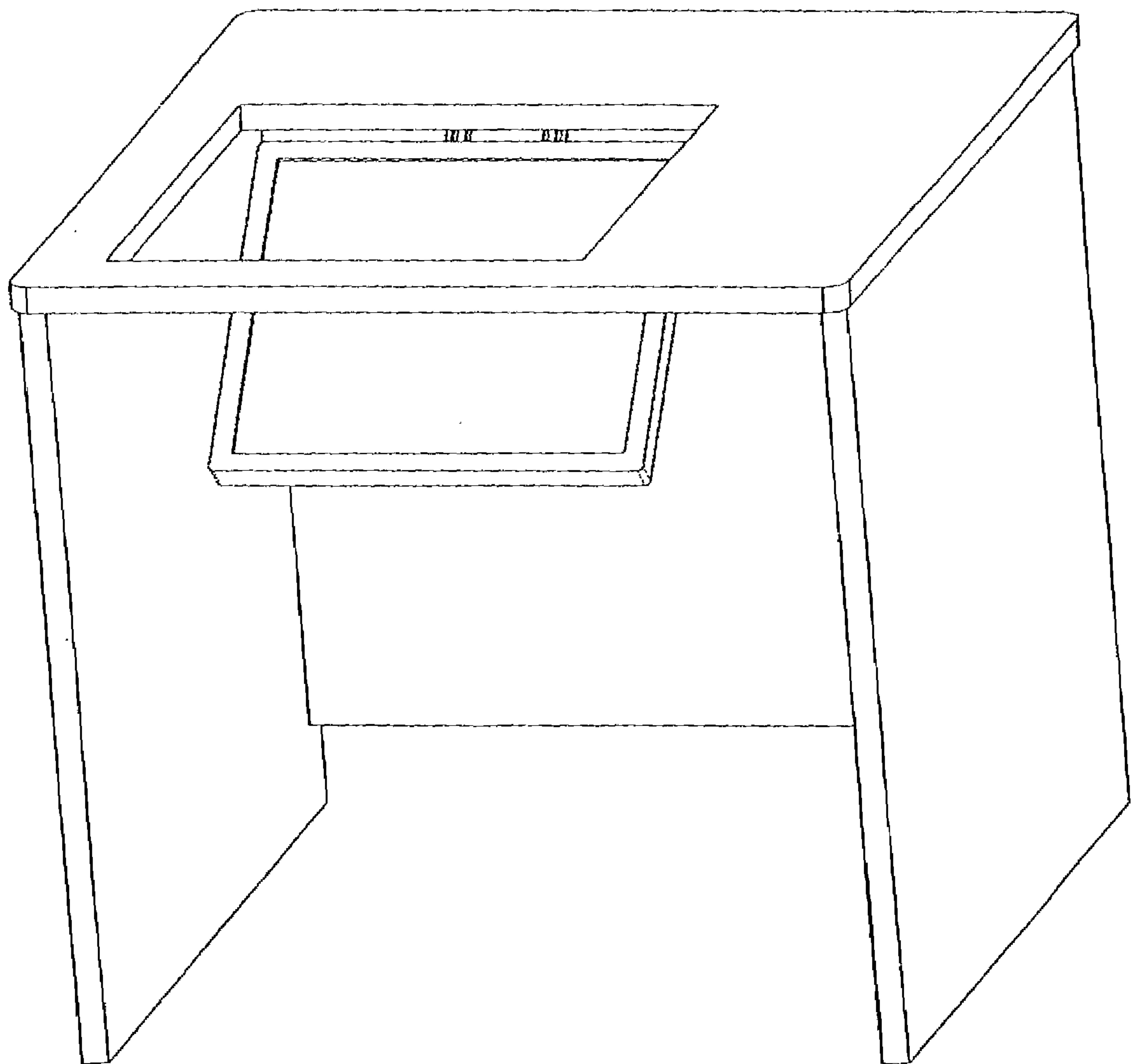


FIG. 1

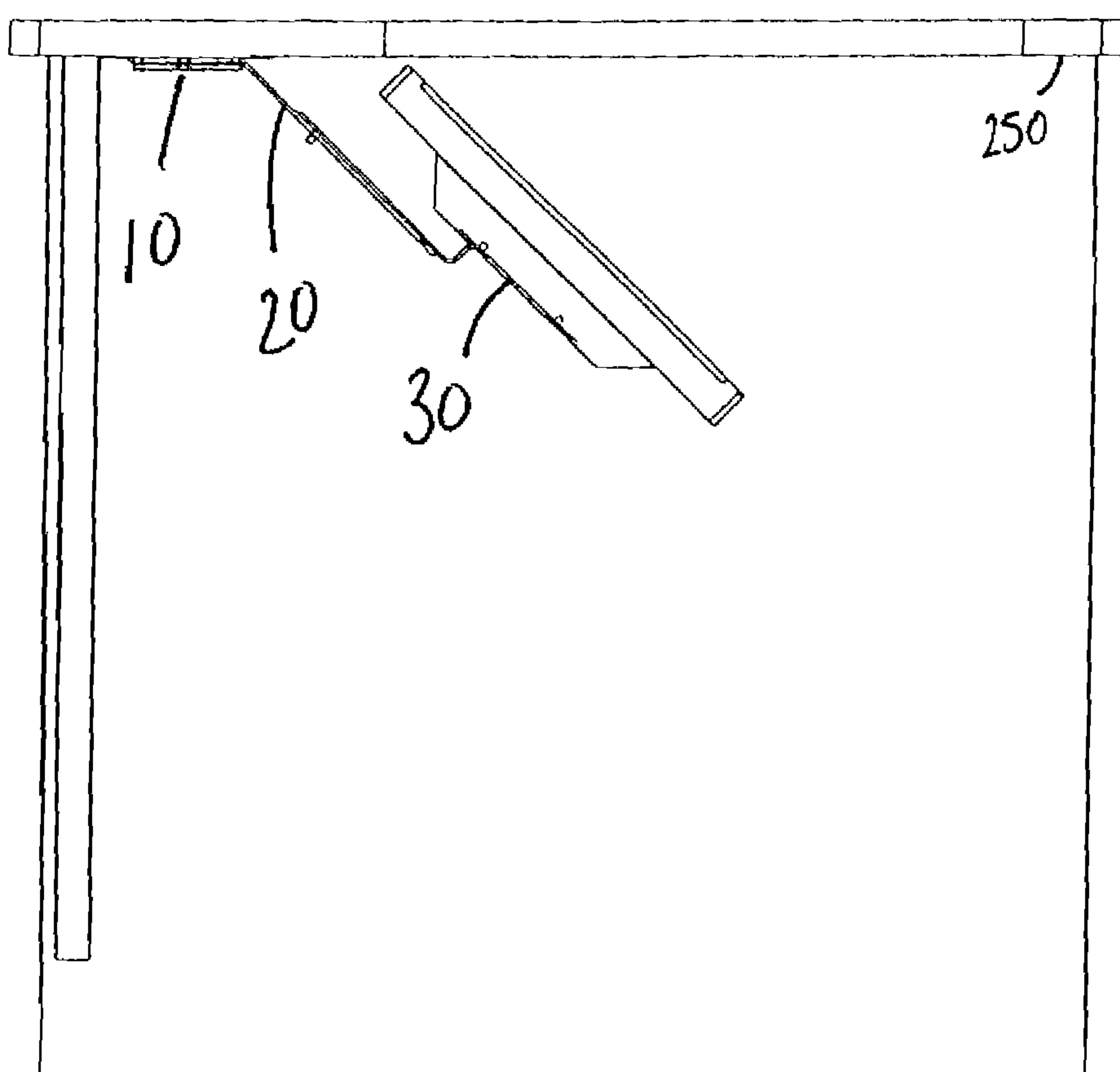
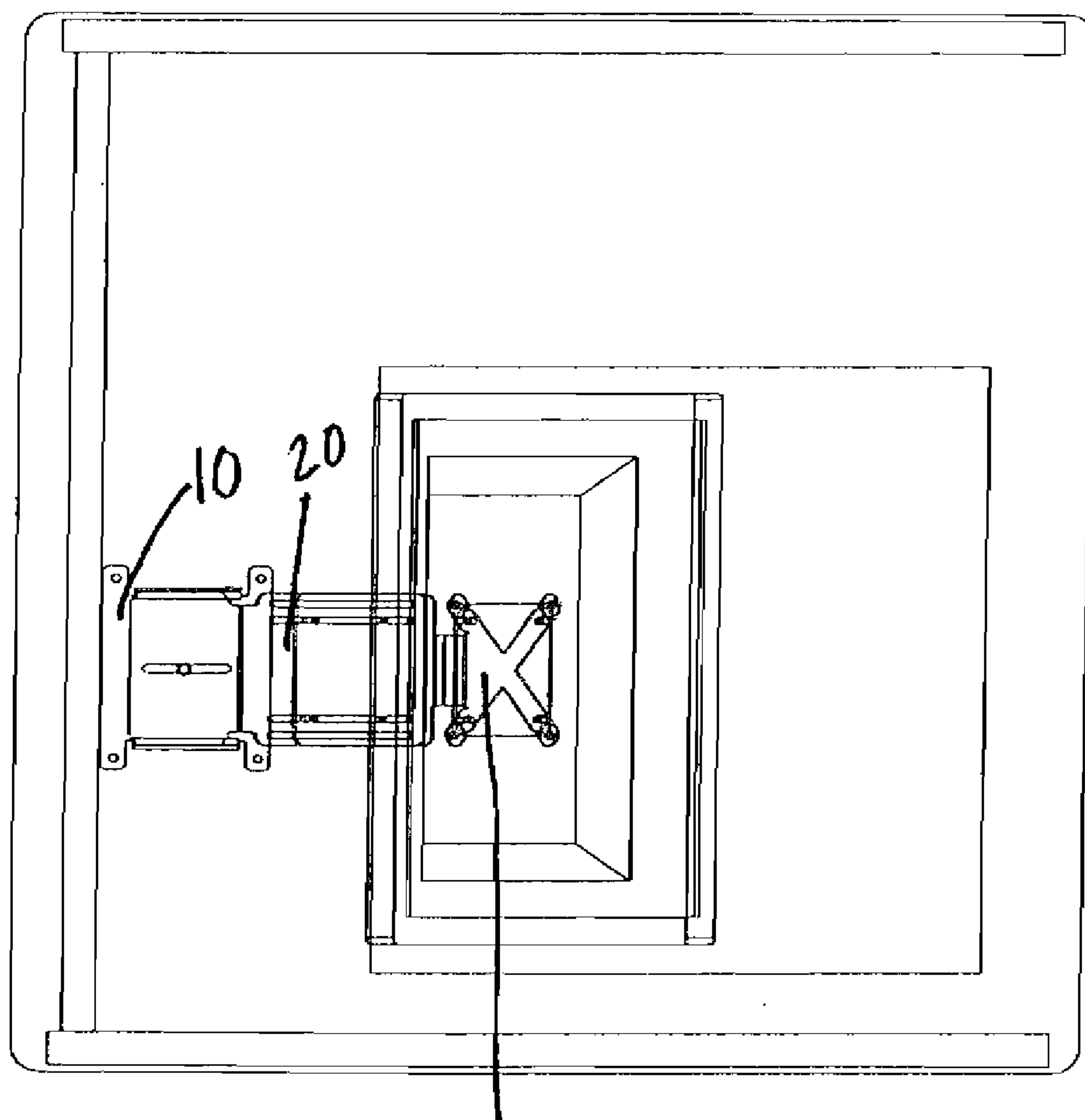
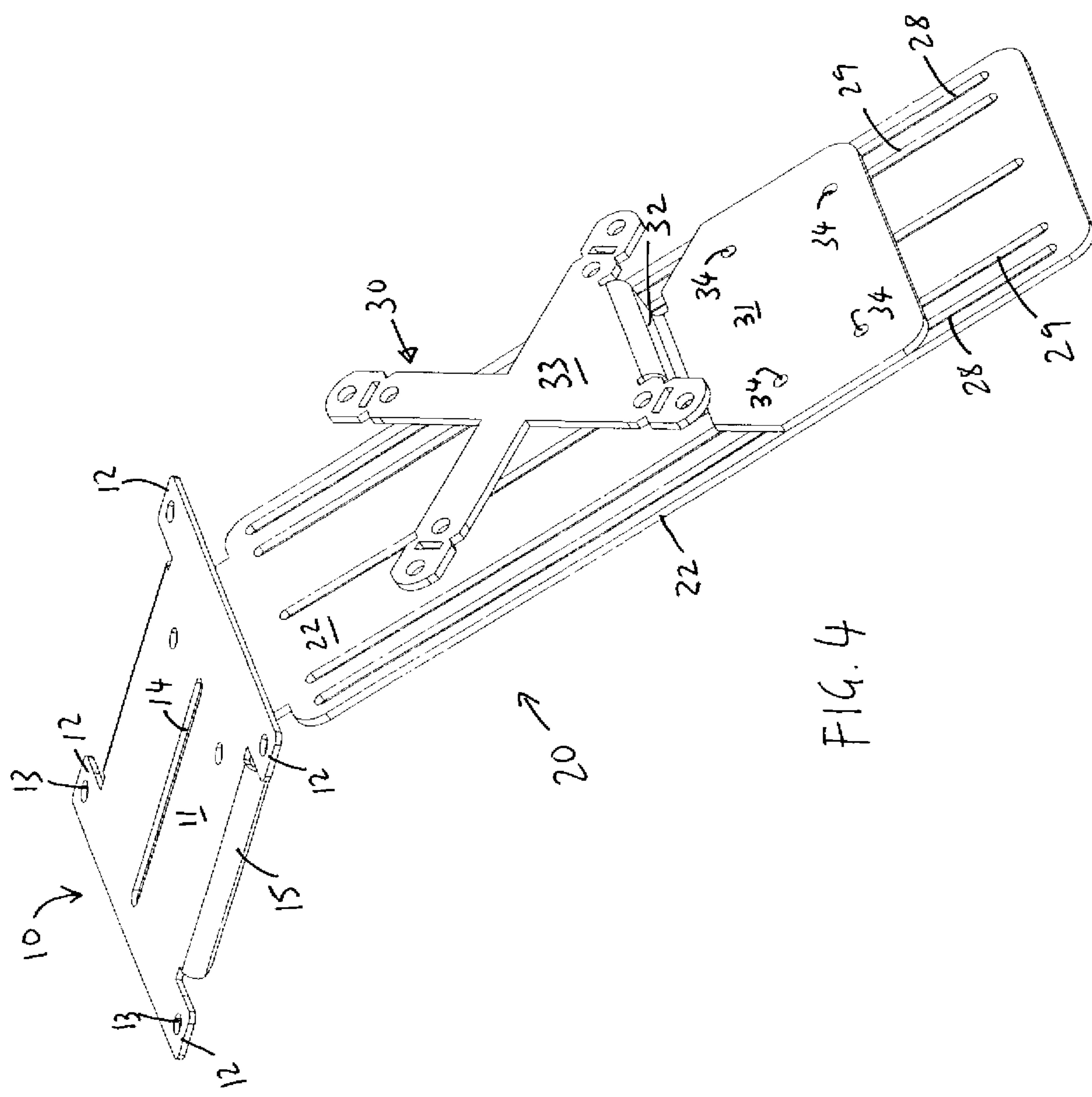


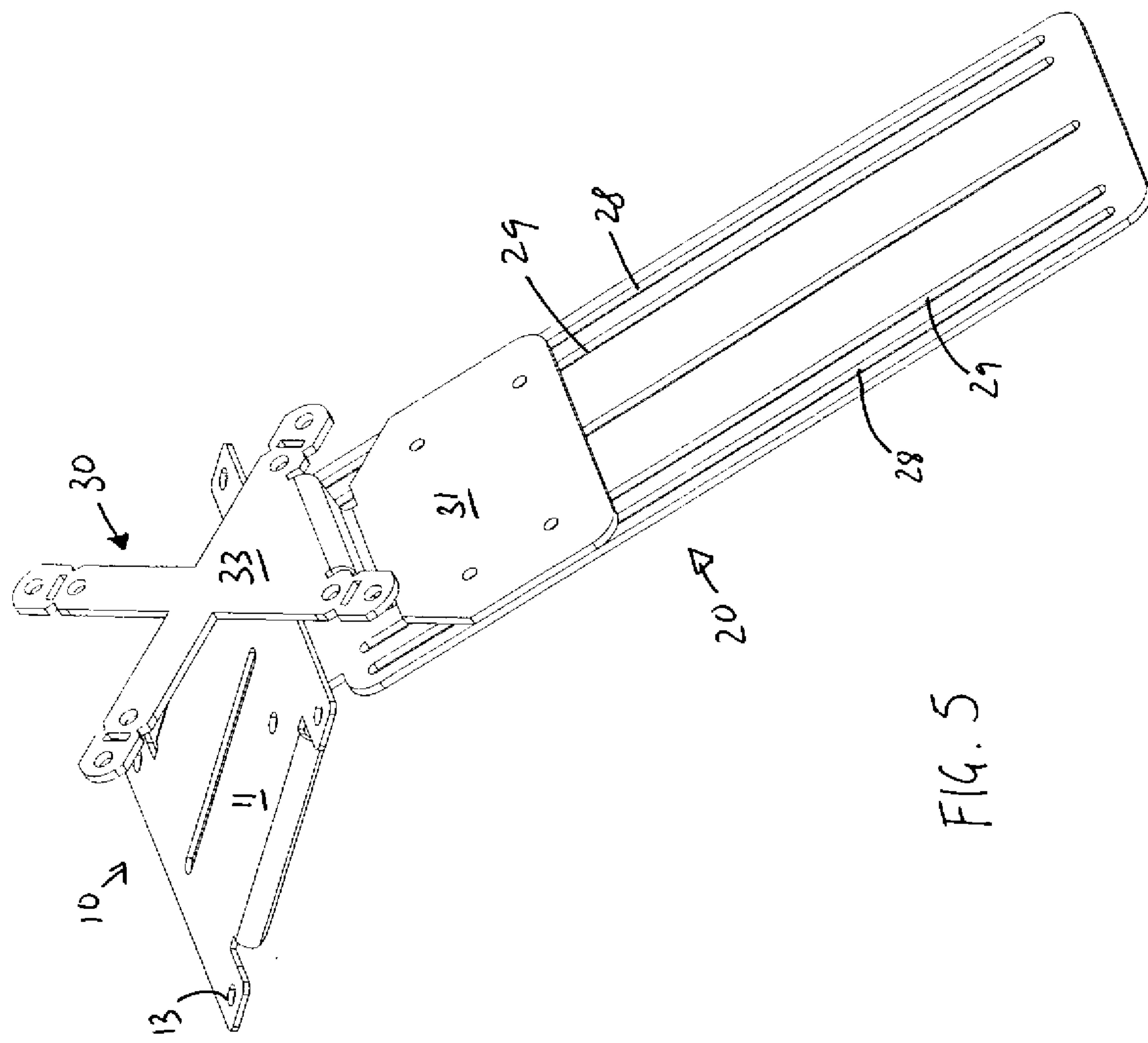
FIG. 2



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FIG. 3





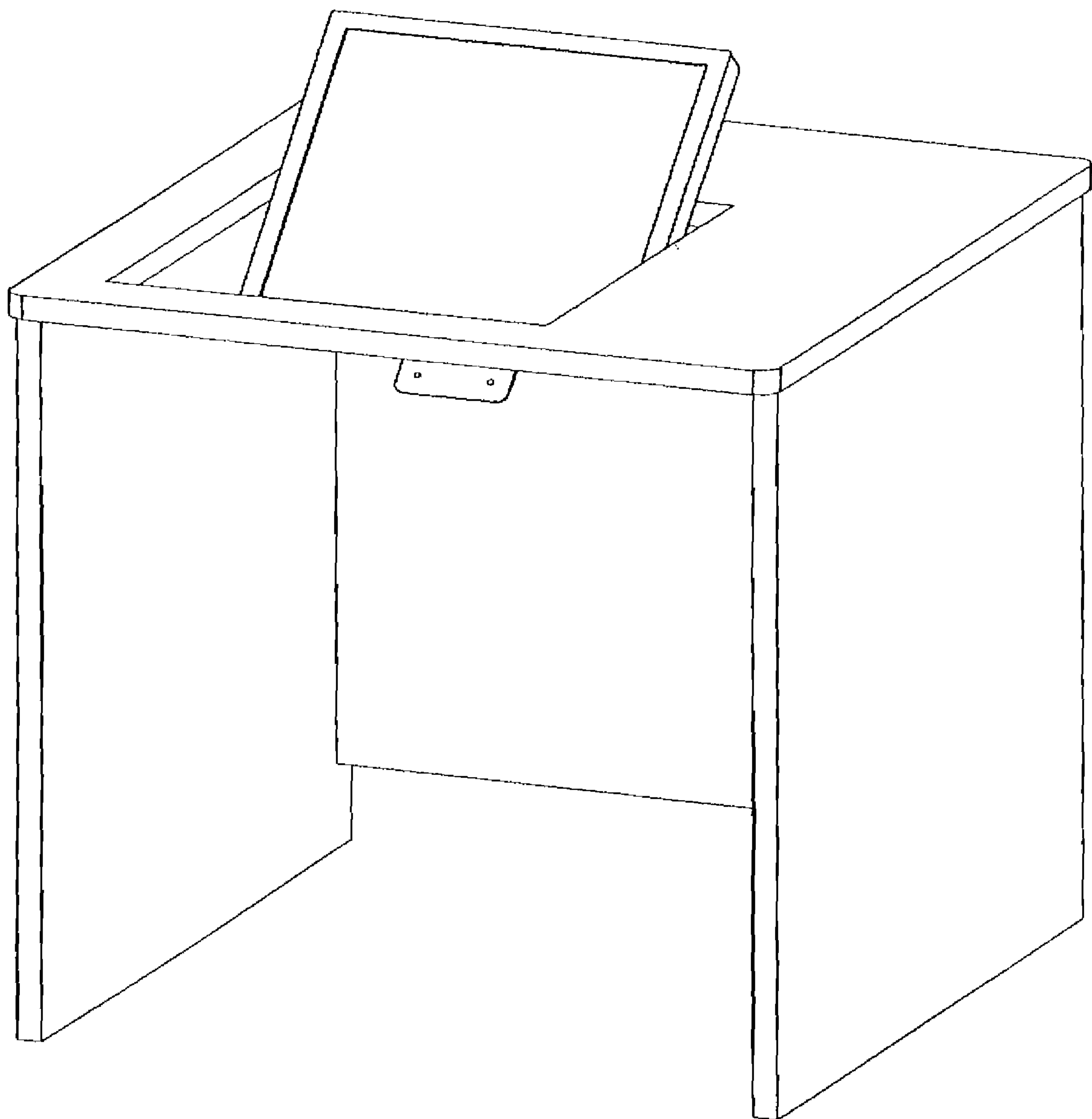


FIG. 6

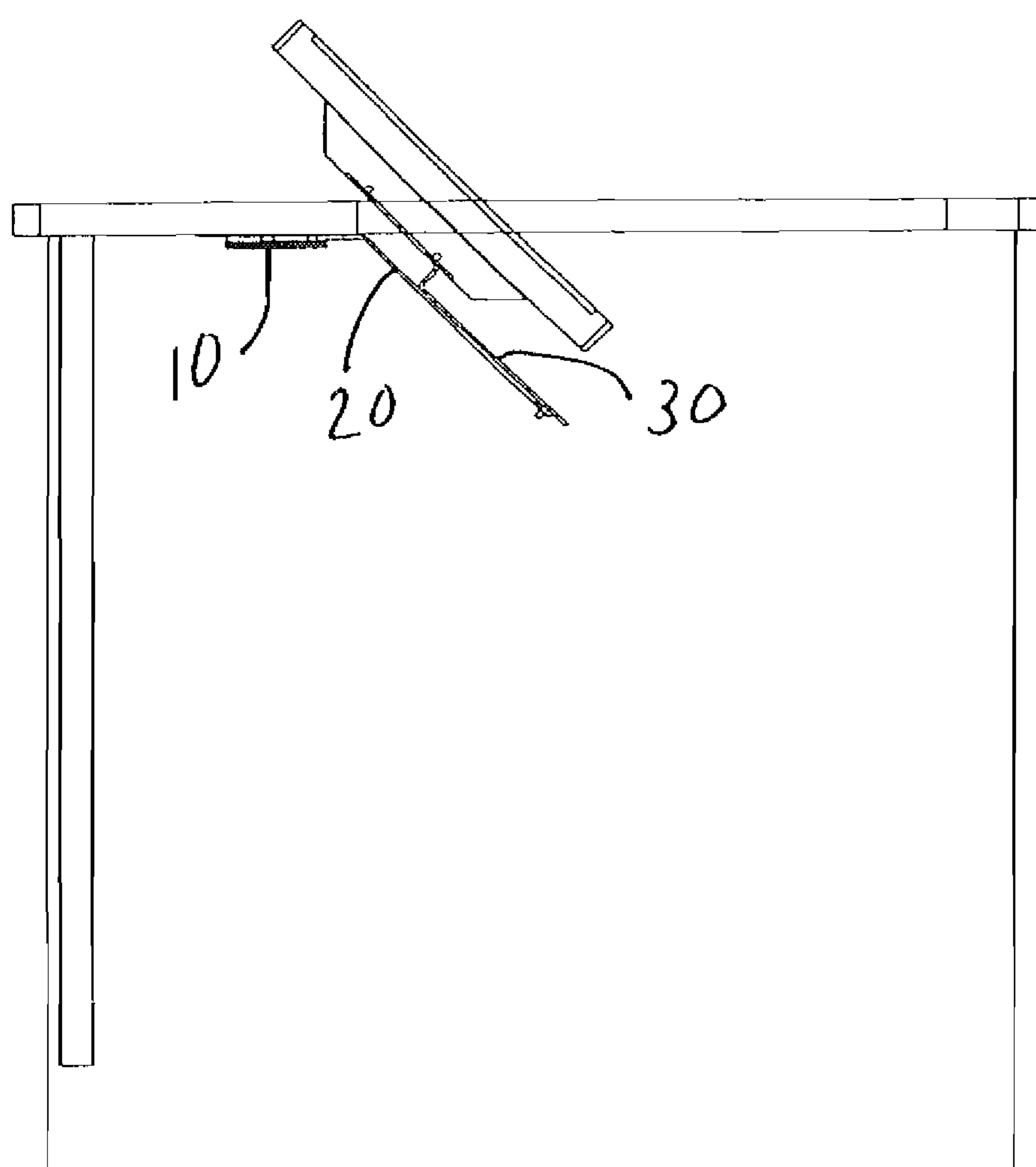
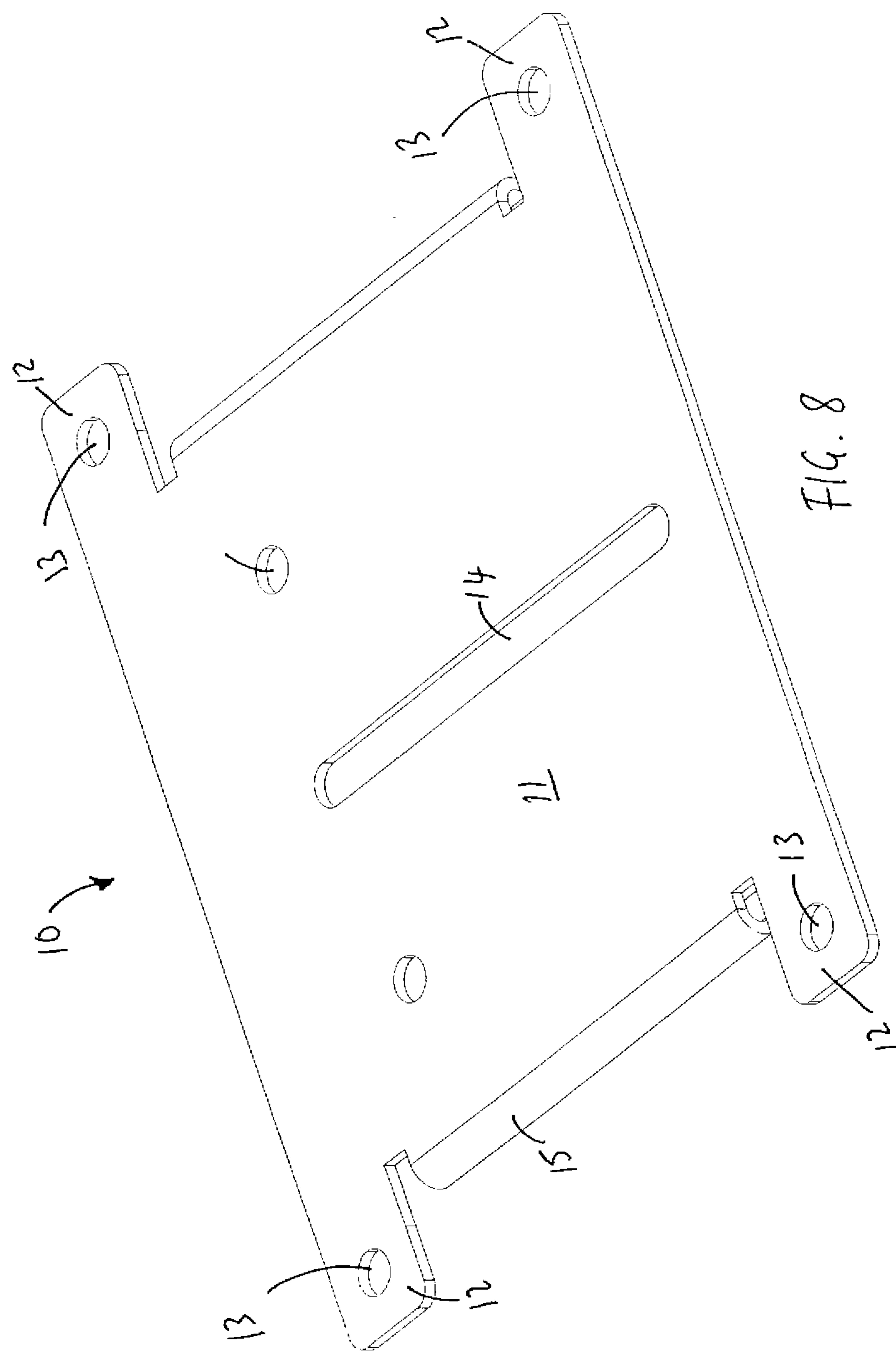


FIG. 7



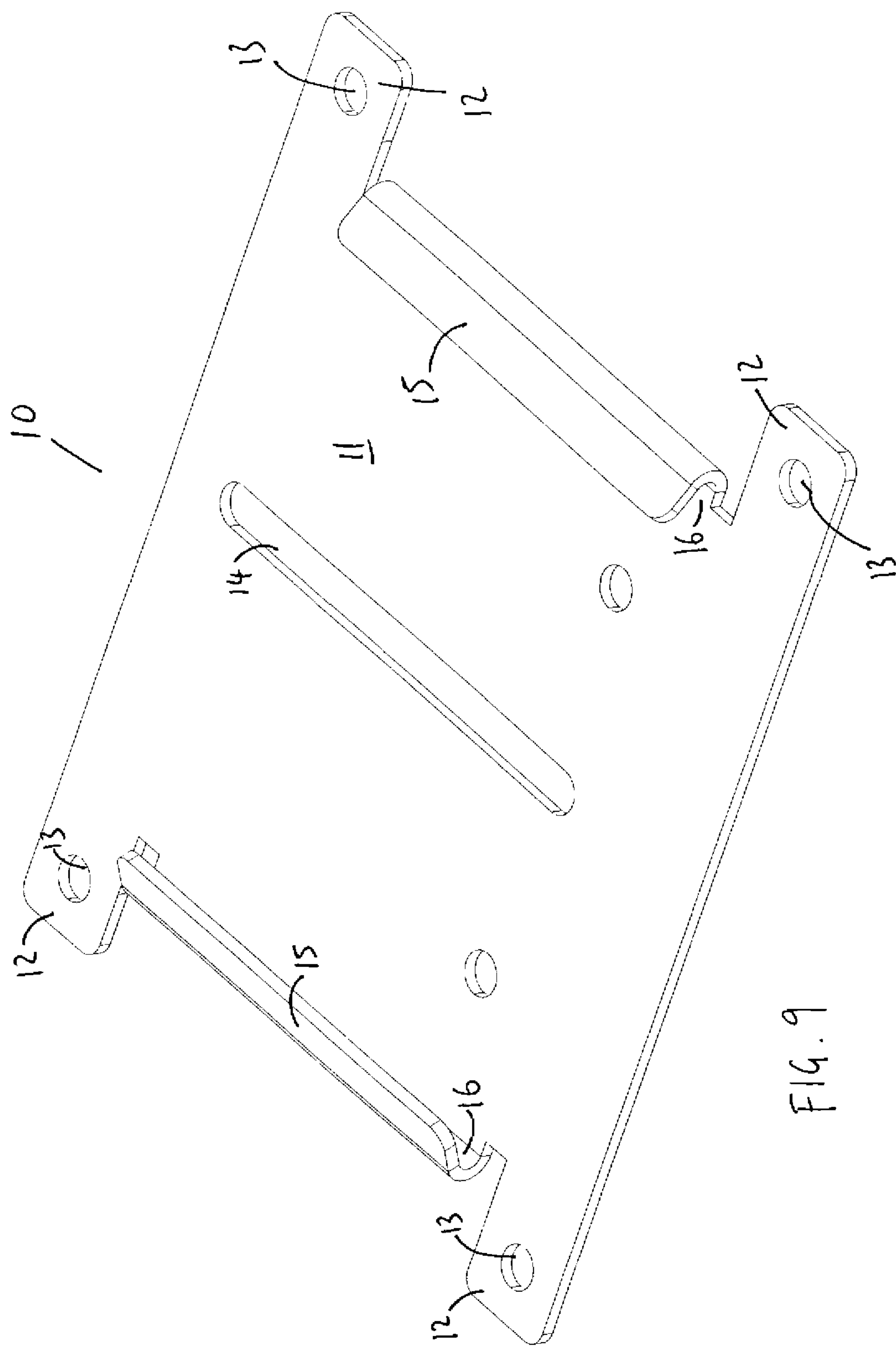
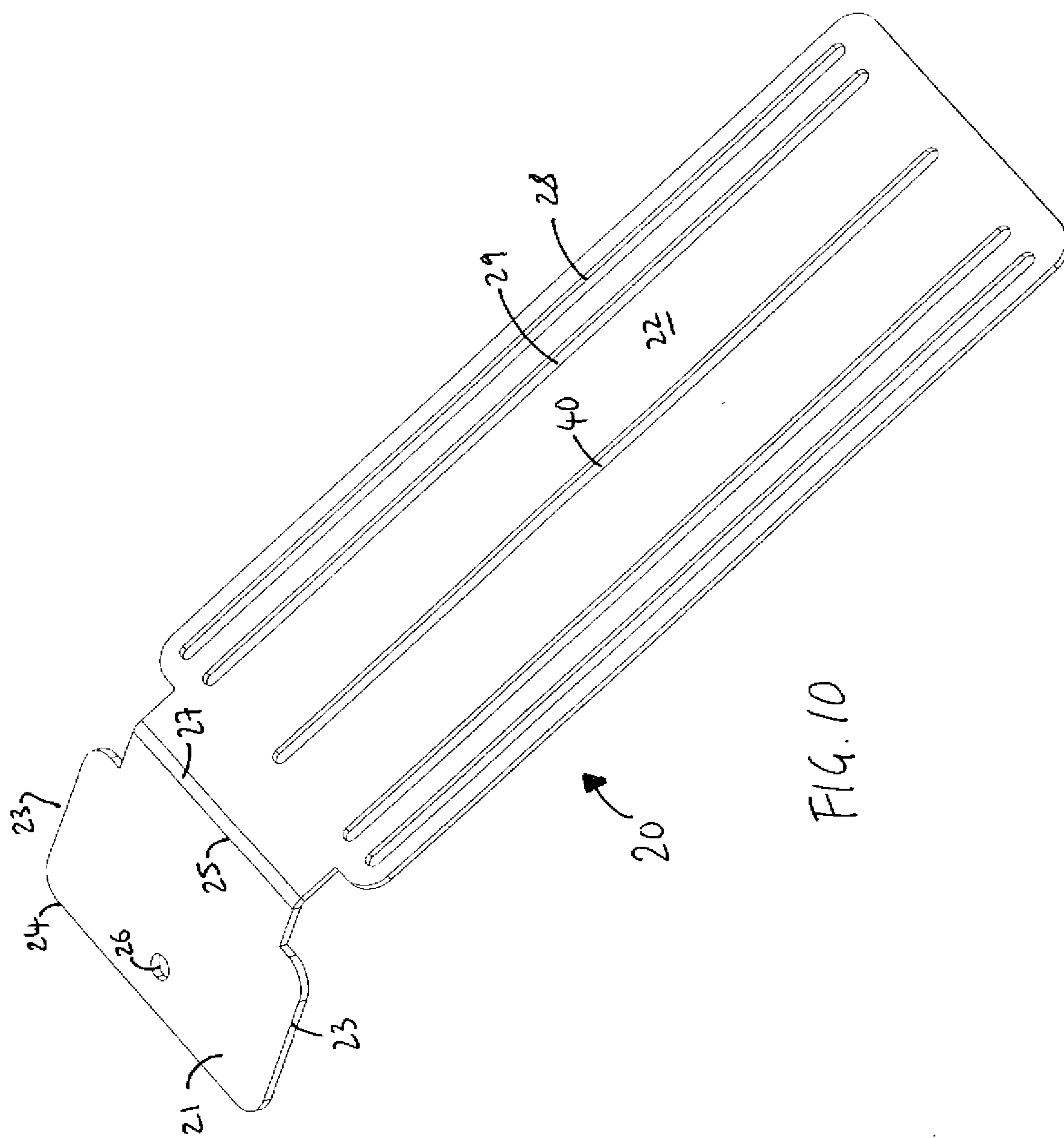
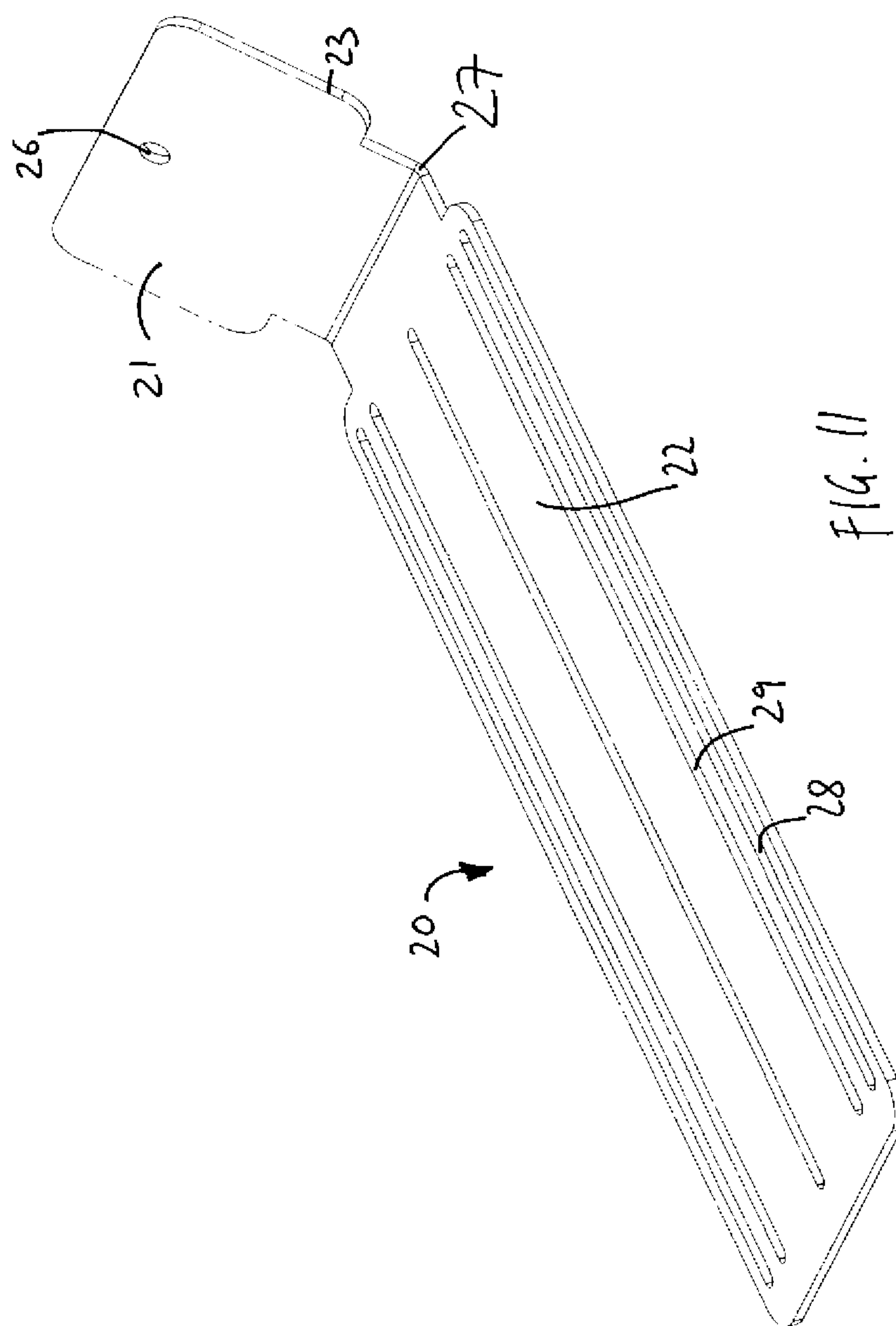
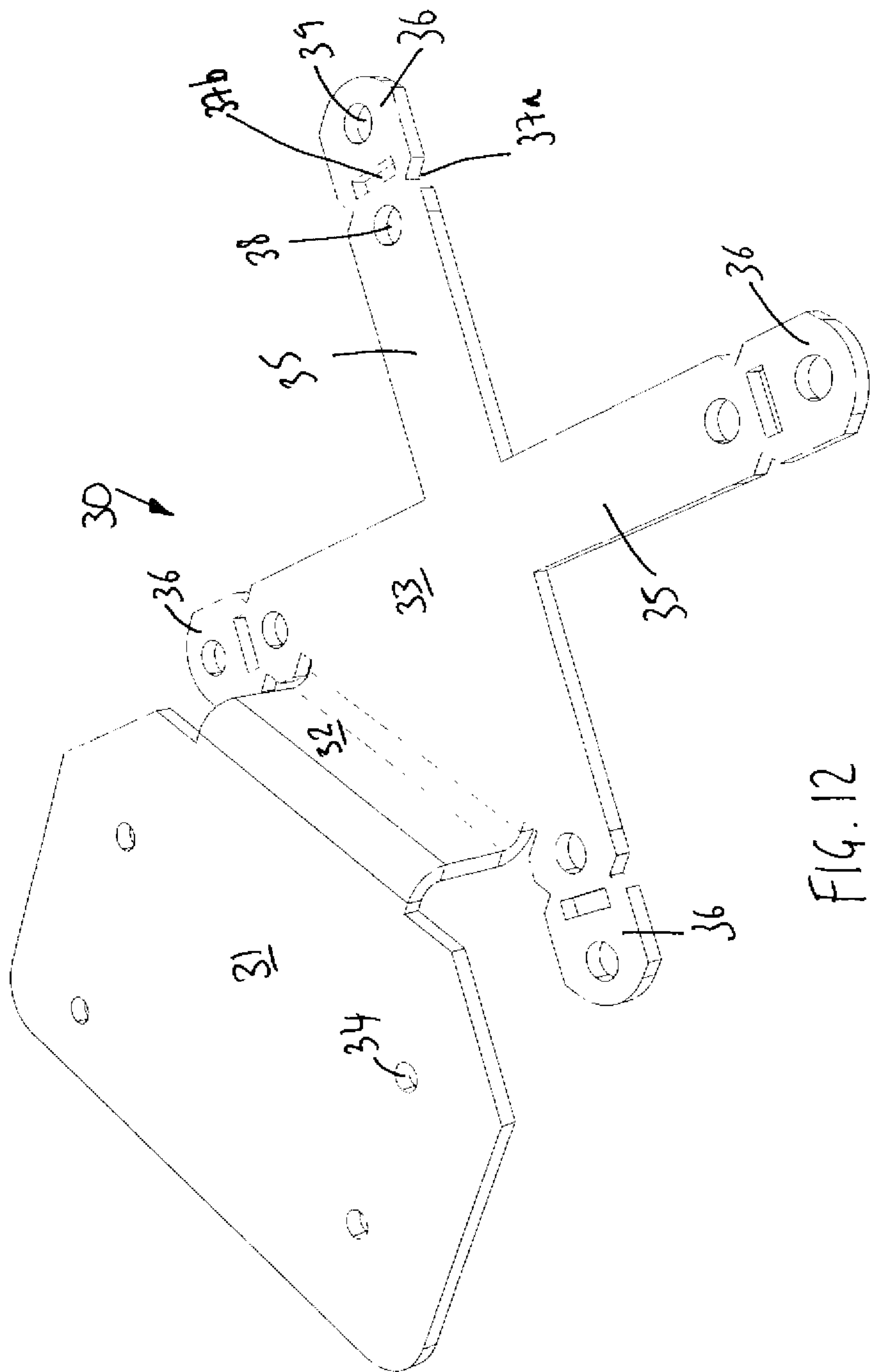


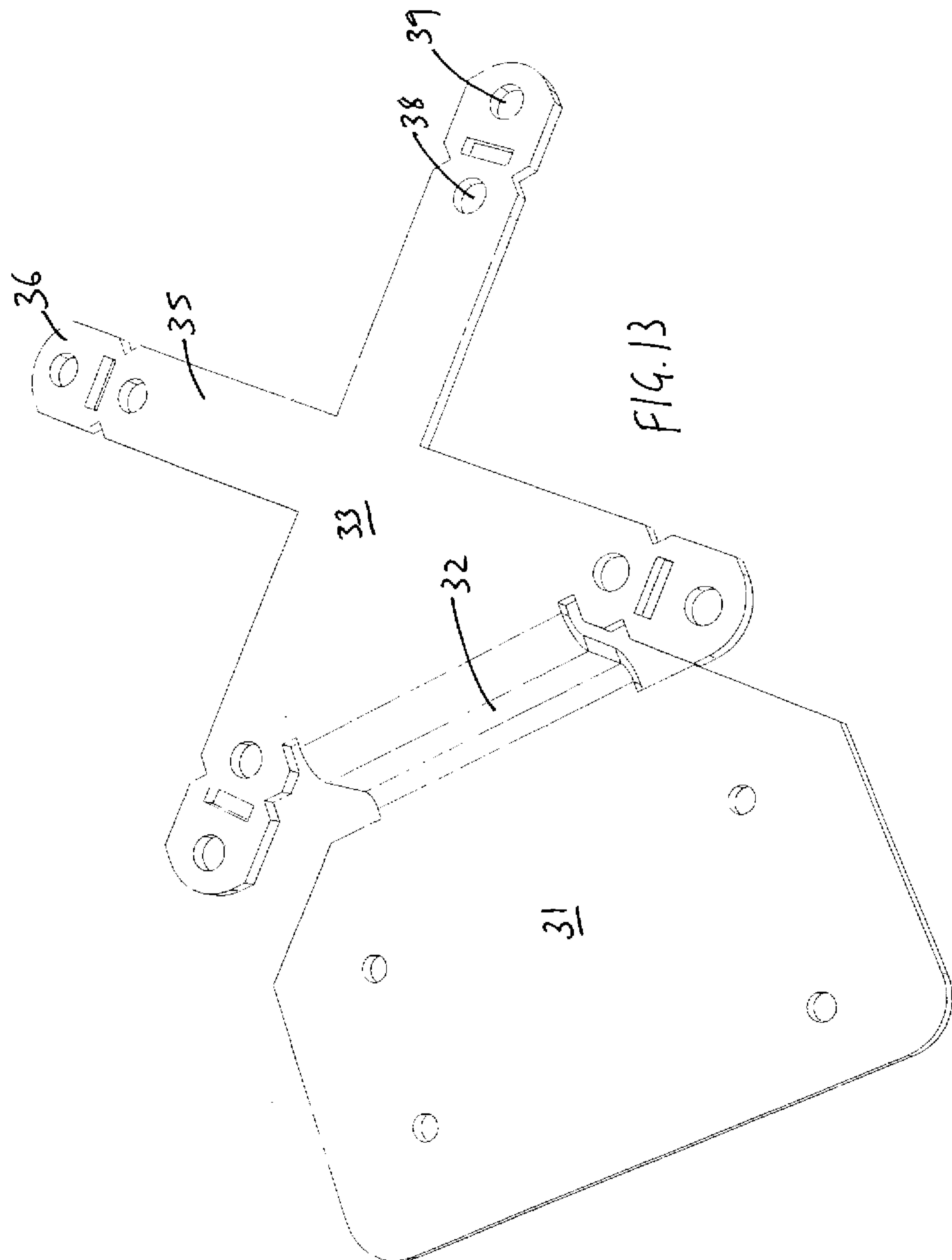
FIG. 9

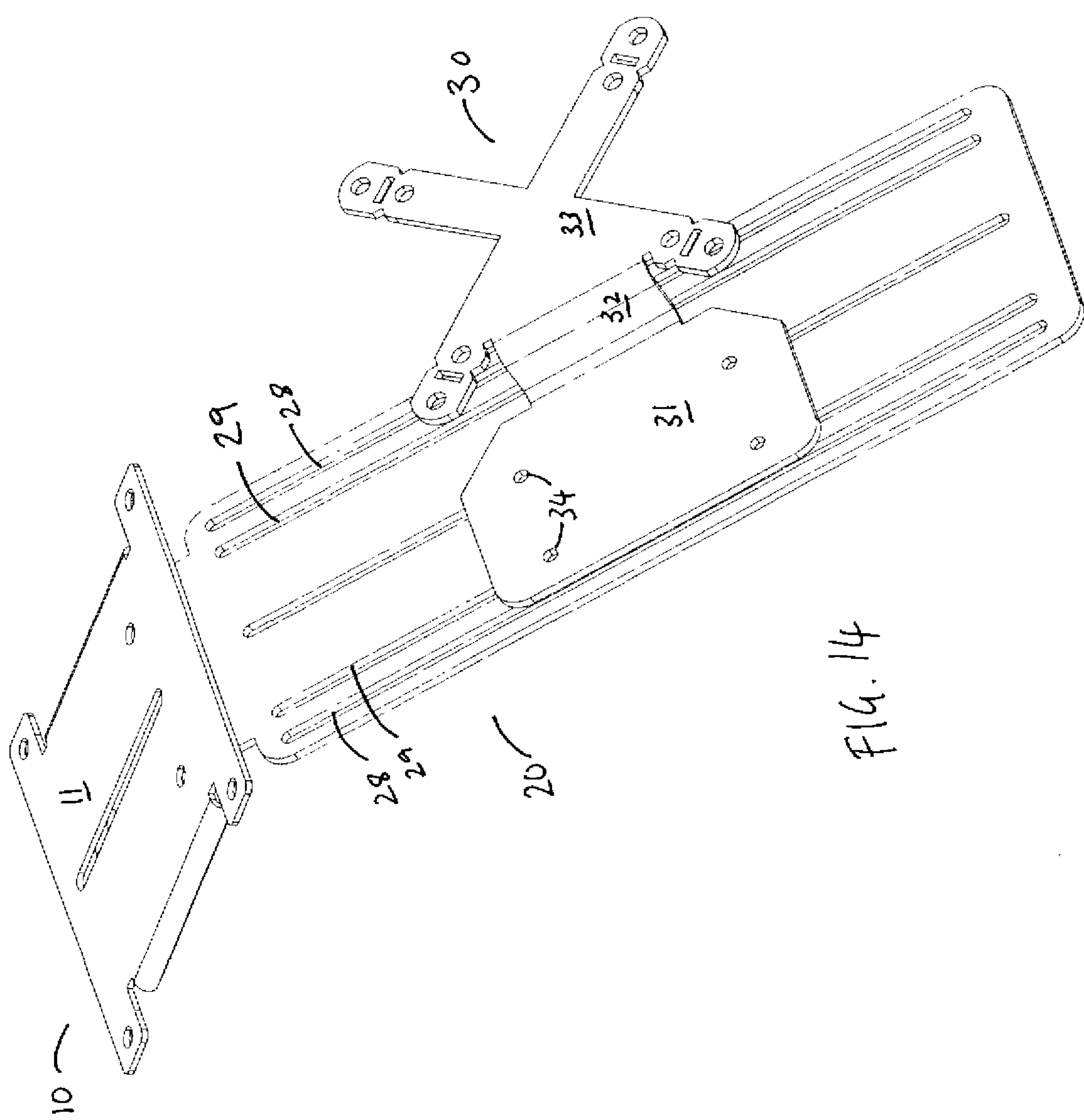


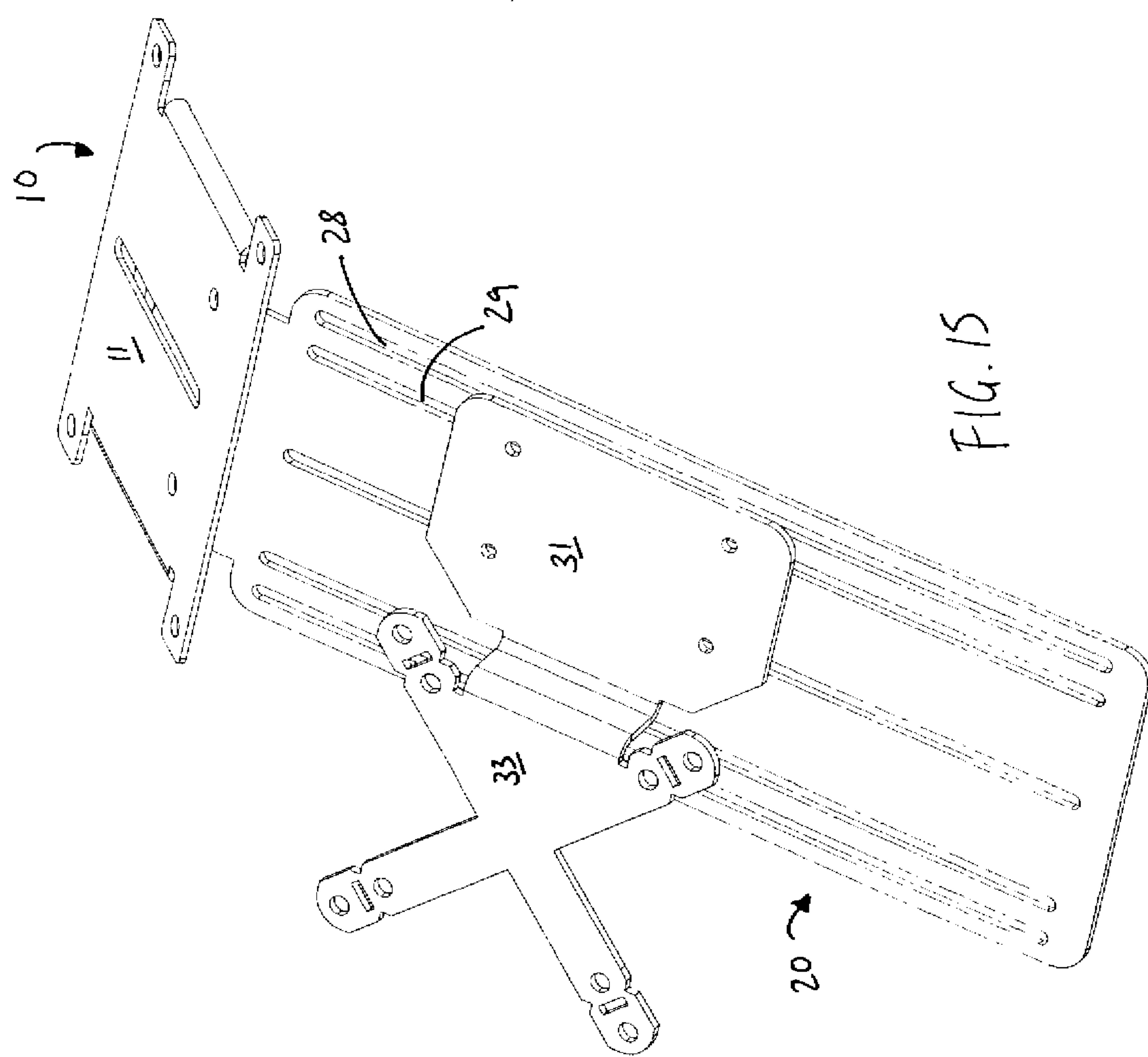


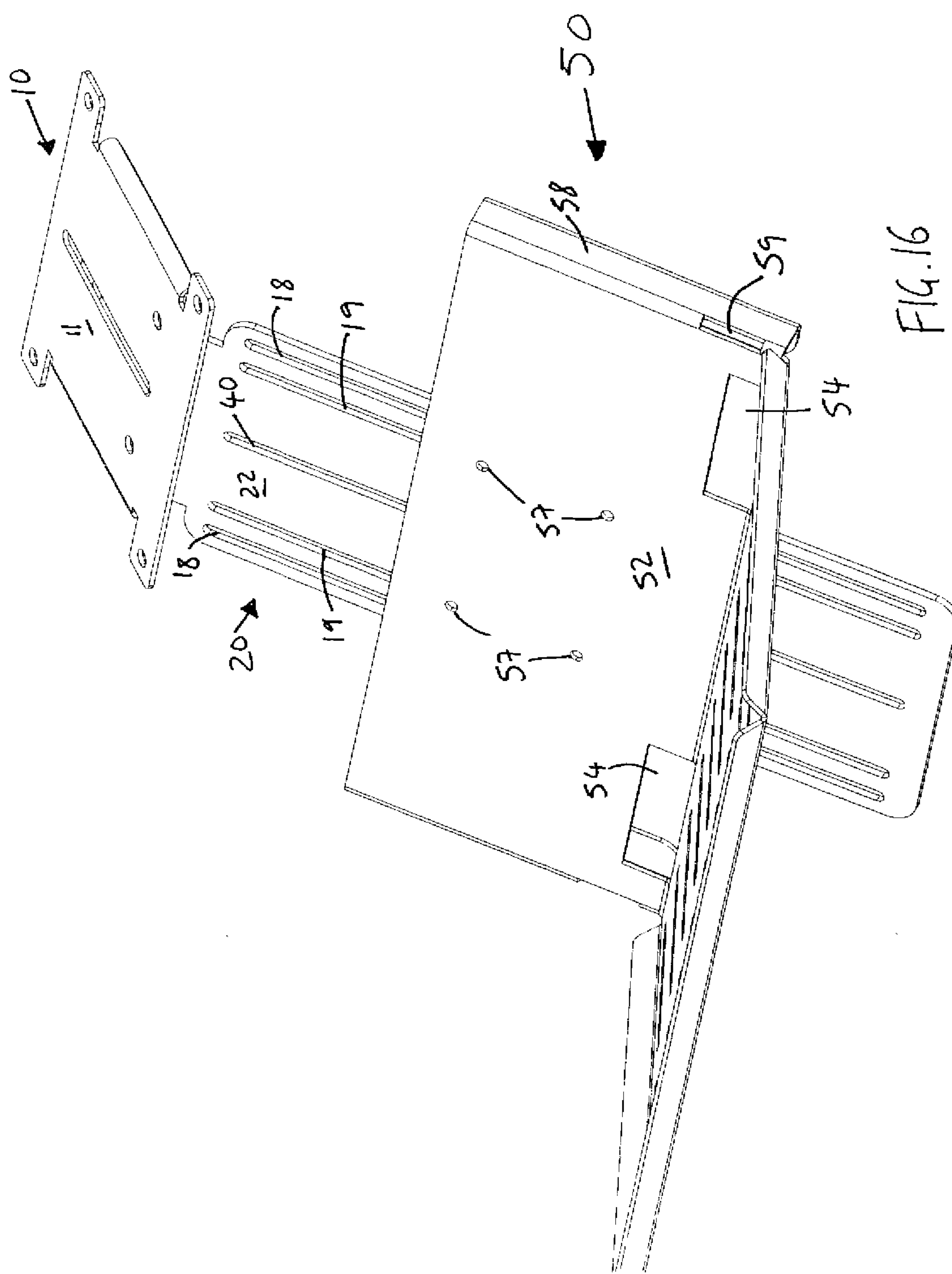


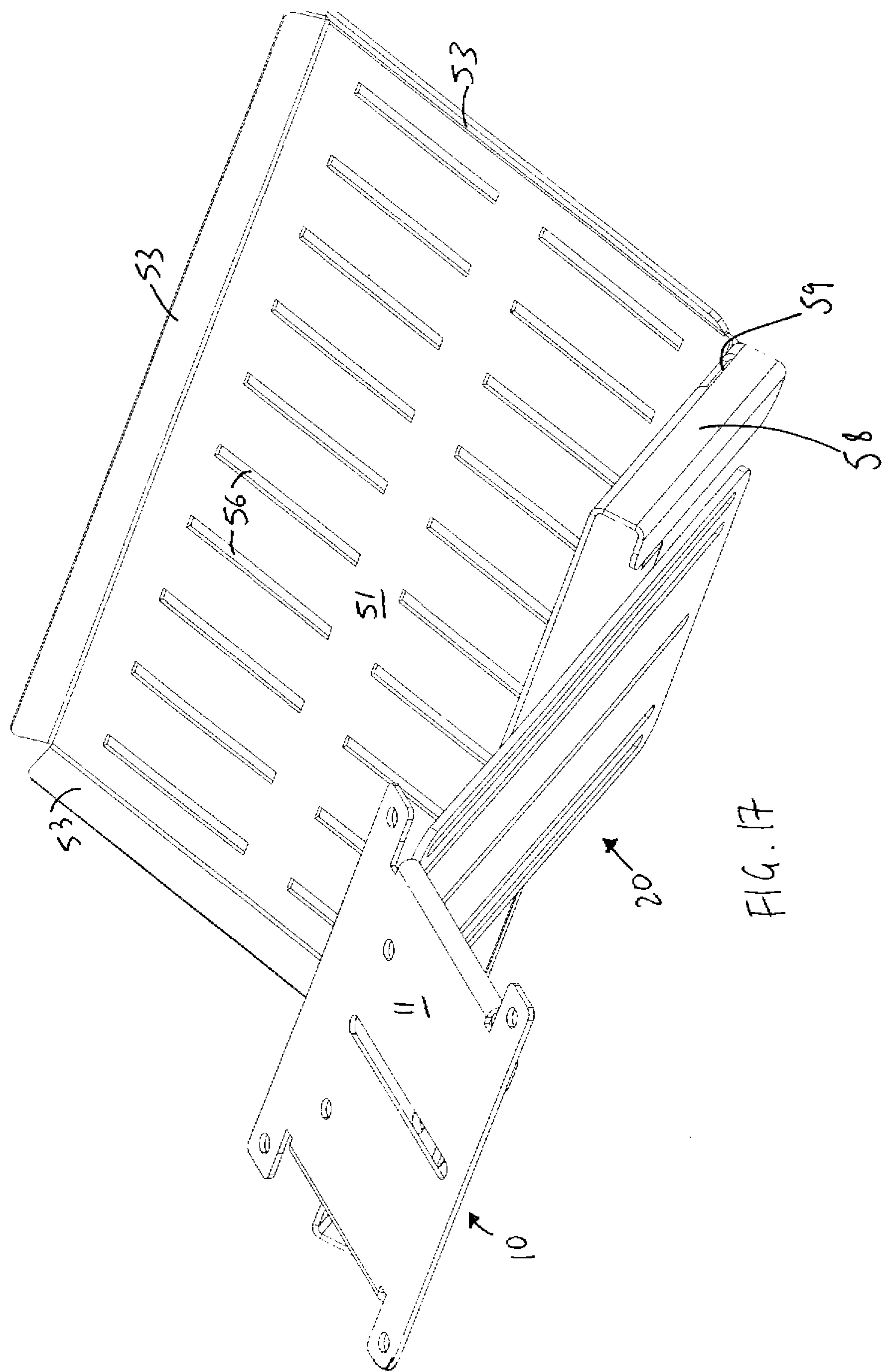
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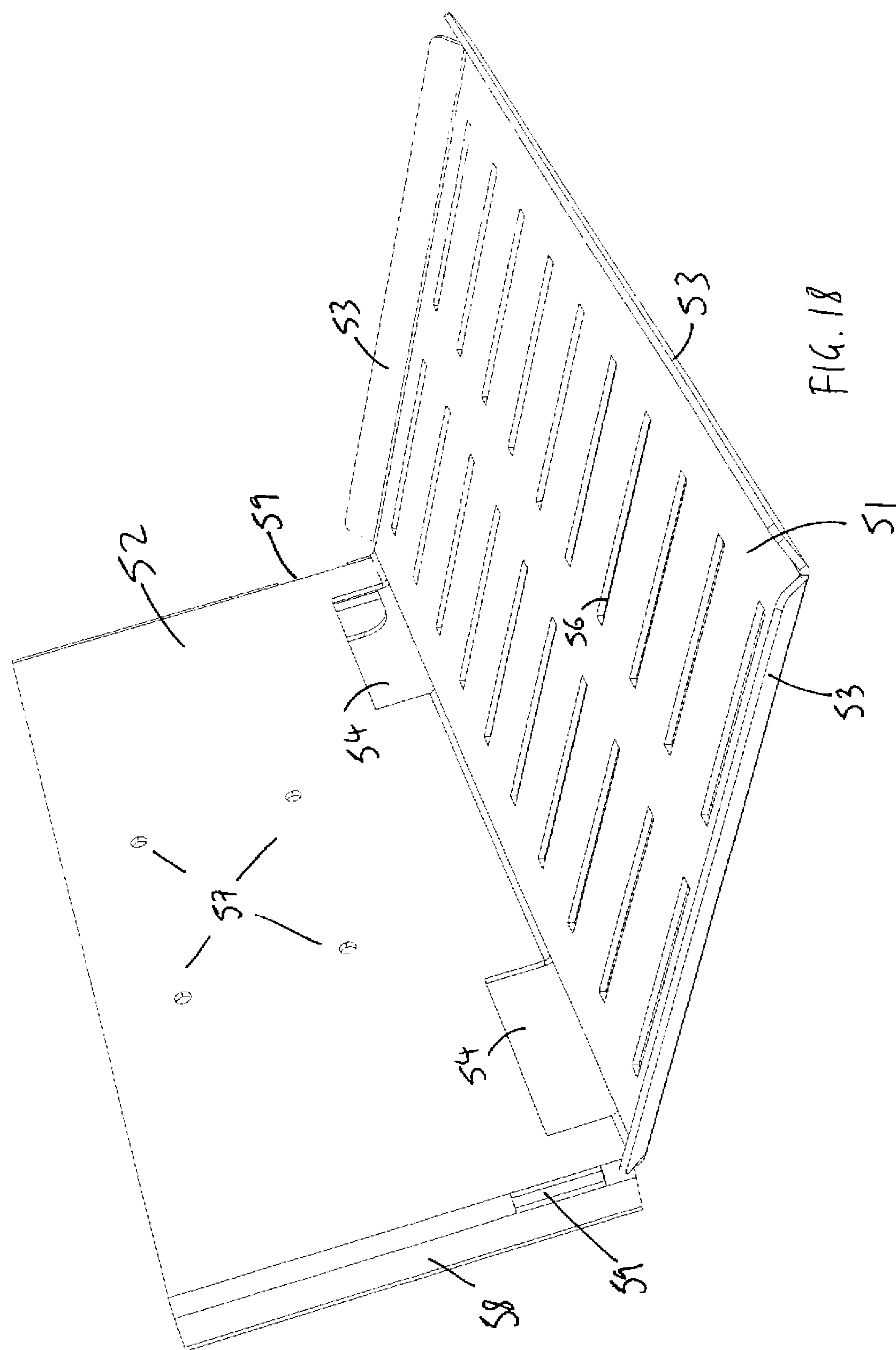


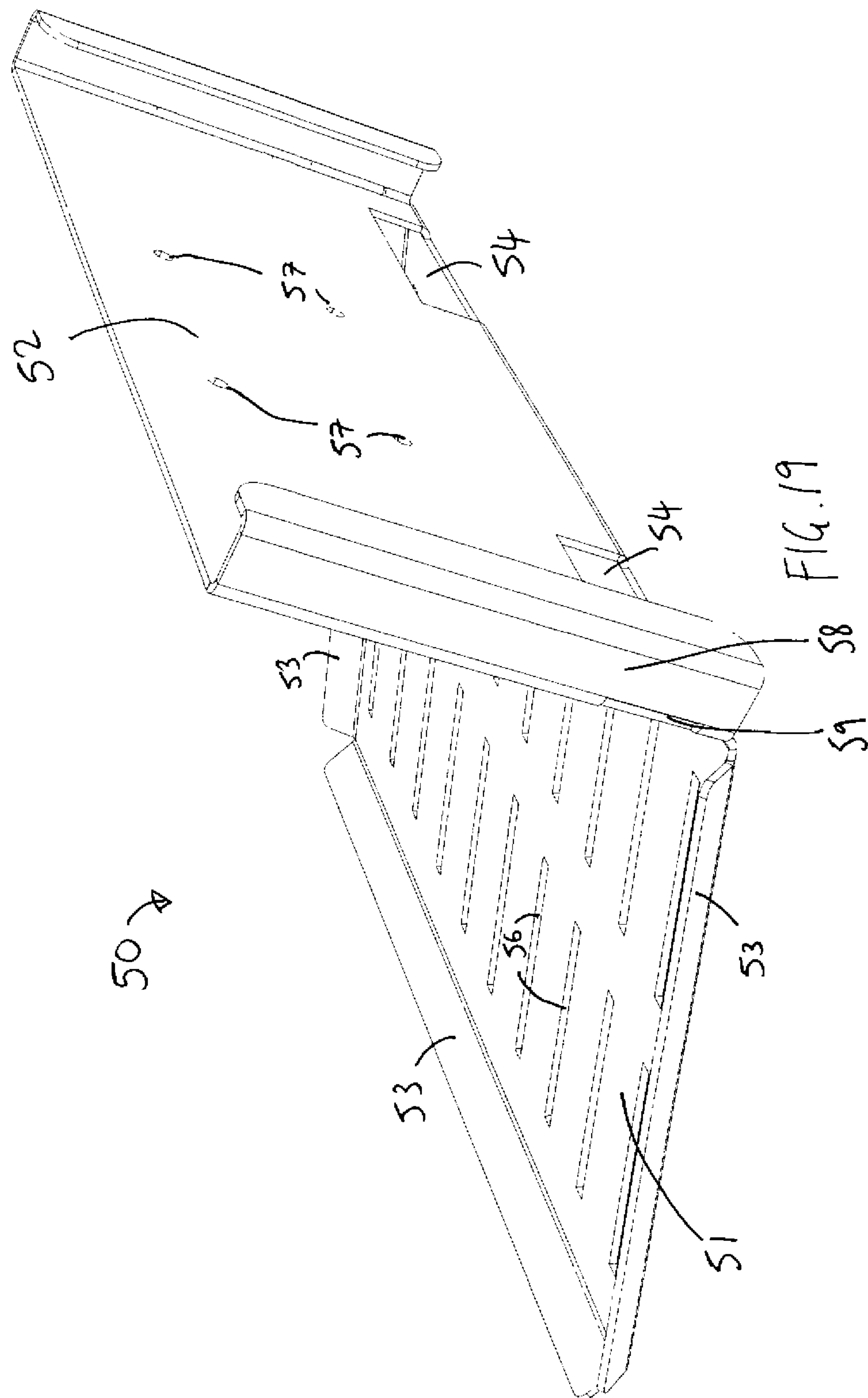












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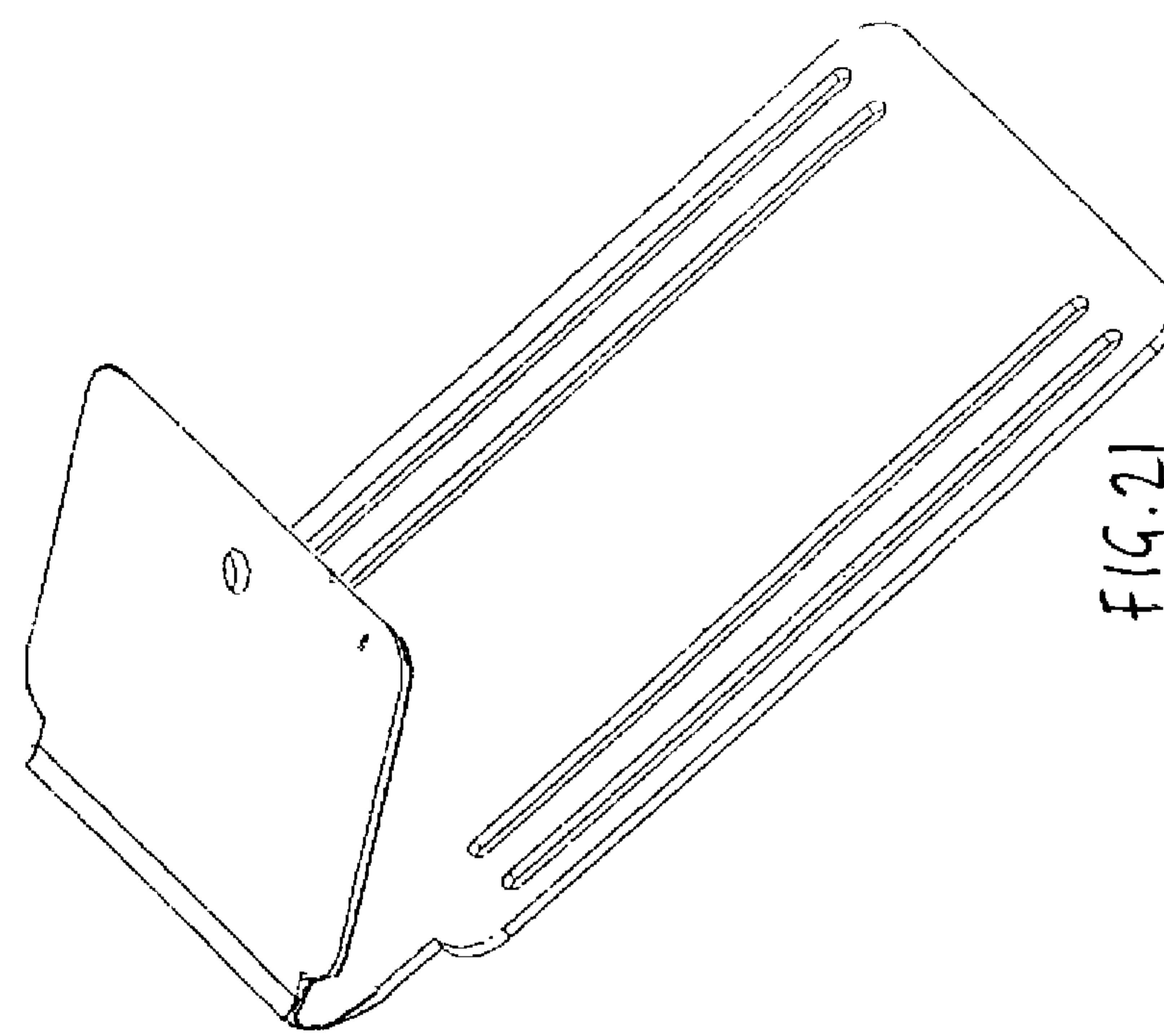
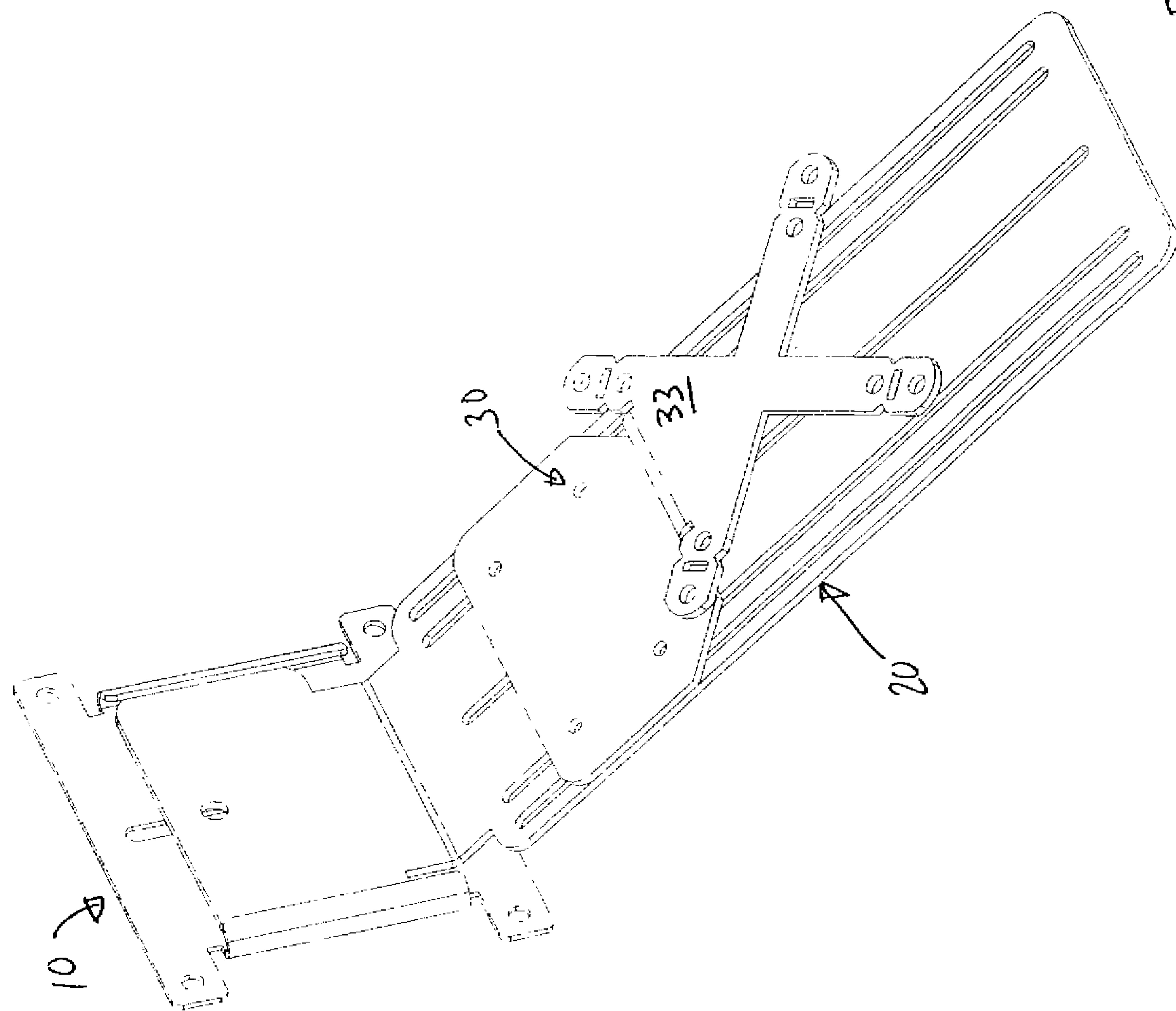


Fig. 21

Fig. 20



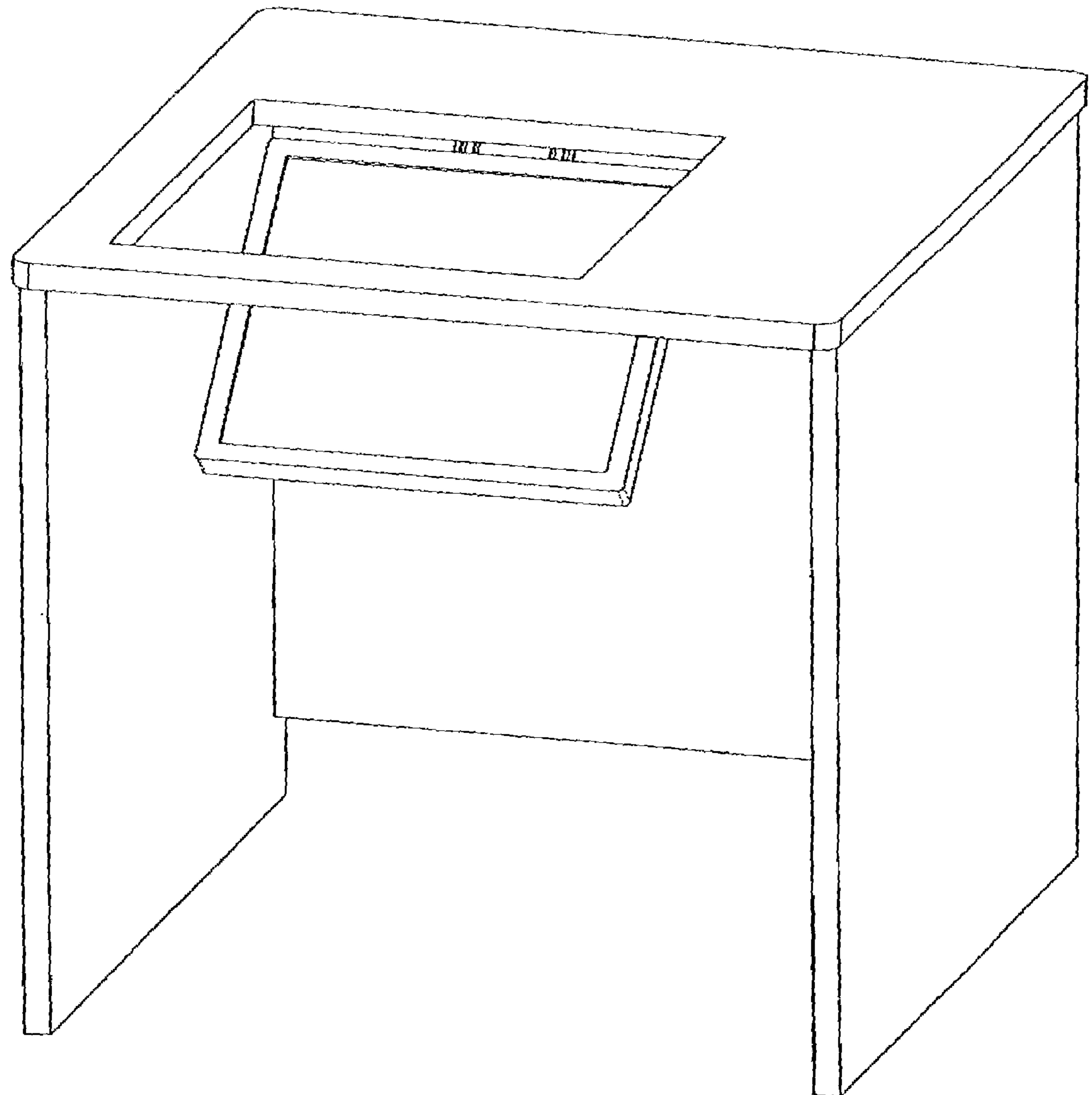


FIG. 1