



US 20140138500A1

(19) **United States**

(12) **Patent Application Publication**

Grey et al.

(10) **Pub. No.: US 2014/0138500 A1**

(43) **Pub. Date: May 22, 2014**

(54) **DISPLAY WALL MOUNT WITH ELASTOMERIC SPRING LATCH**

Publication Classification

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(51) **Int. Cl.**
H05K 7/14 (2006.01)

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(52) **U.S. Cl.**
CPC *H05K 7/14* (2013.01)
USPC **248/201; 29/428**

(21) Appl. No.: **13/909,910**

(57) **ABSTRACT**

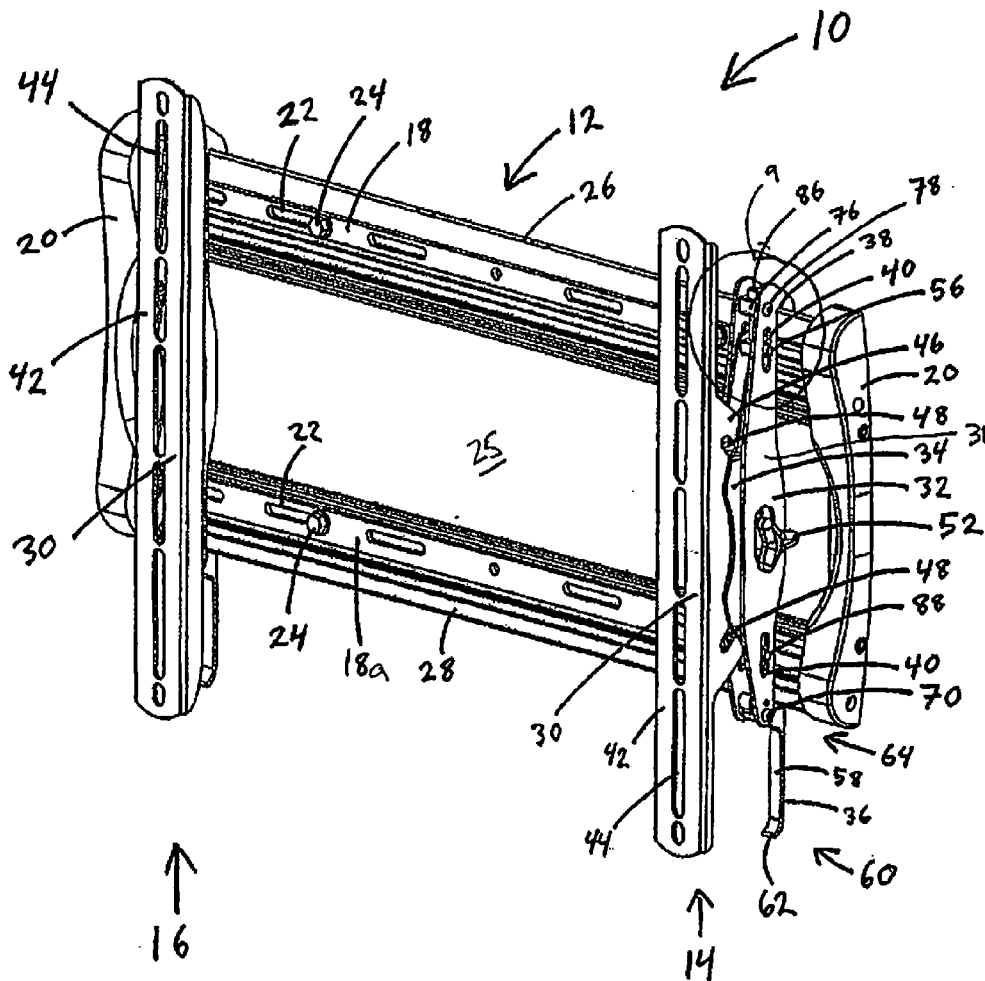
(22) Filed: **Jun. 4, 2013**

Related U.S. Application Data

(63) Continuation of application No. 12/675,384, filed on Aug. 3, 2010, now Pat. No. 8,456,808, filed as application No. PCT/US2008/075546 on Sep. 8, 2008.

(60) Provisional application No. 61/019,126, filed on Jan. 4, 2008, provisional application No. 60/970,429, filed on Sep. 6, 2007.

A mounting system for an electronic display providing enhanced versatility of movement and ease of installation. The mounting system includes a latch and kickstand assembly for latching the display to a support structure mountable to a wall and propping the bottom edge of the display away from the wall to enable connection of wires to the back of the display while the display is mounted on the wall. The mount further includes a vertical position adjustment assembly to enable vertical positioning and leveling of the display after the display is mounted.



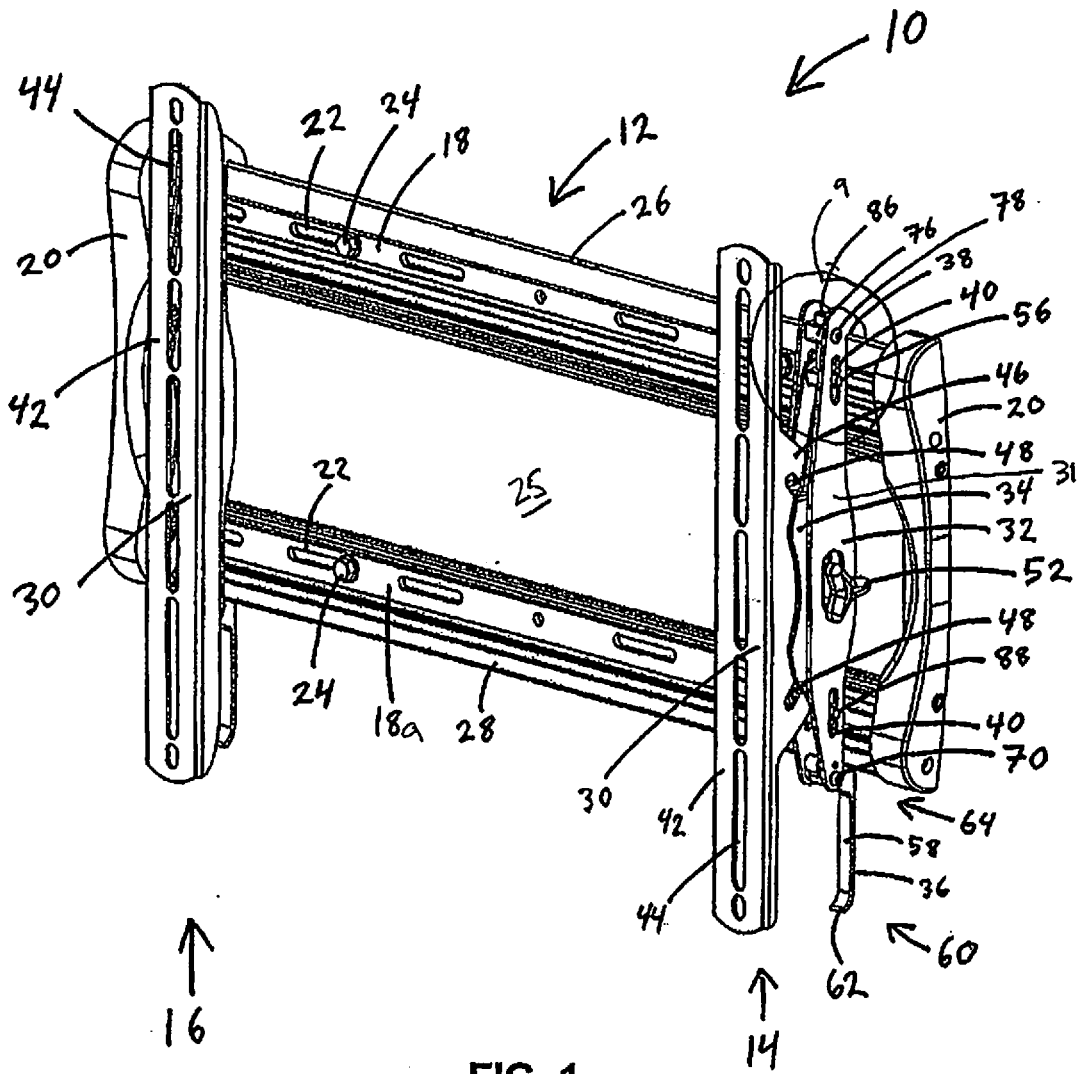
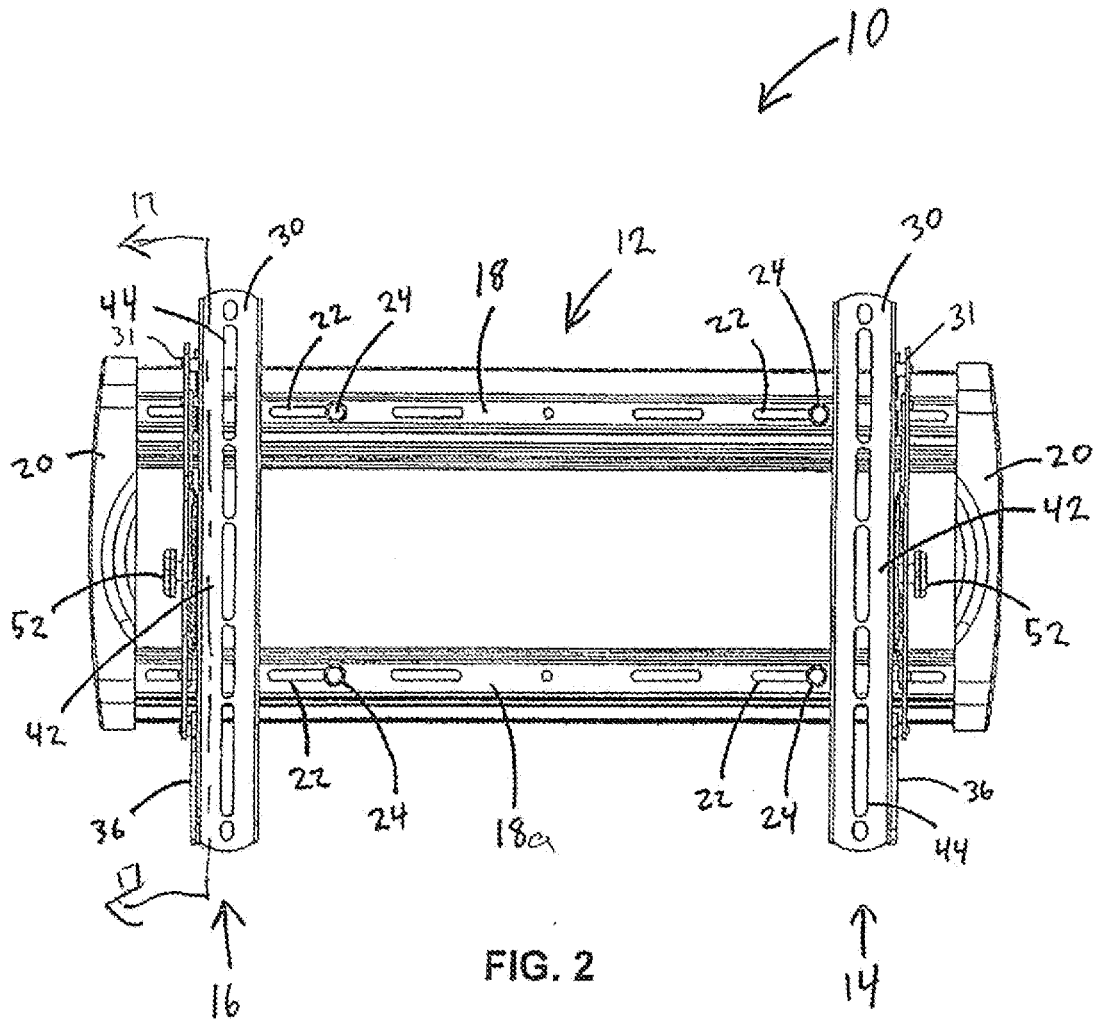


FIG. 1



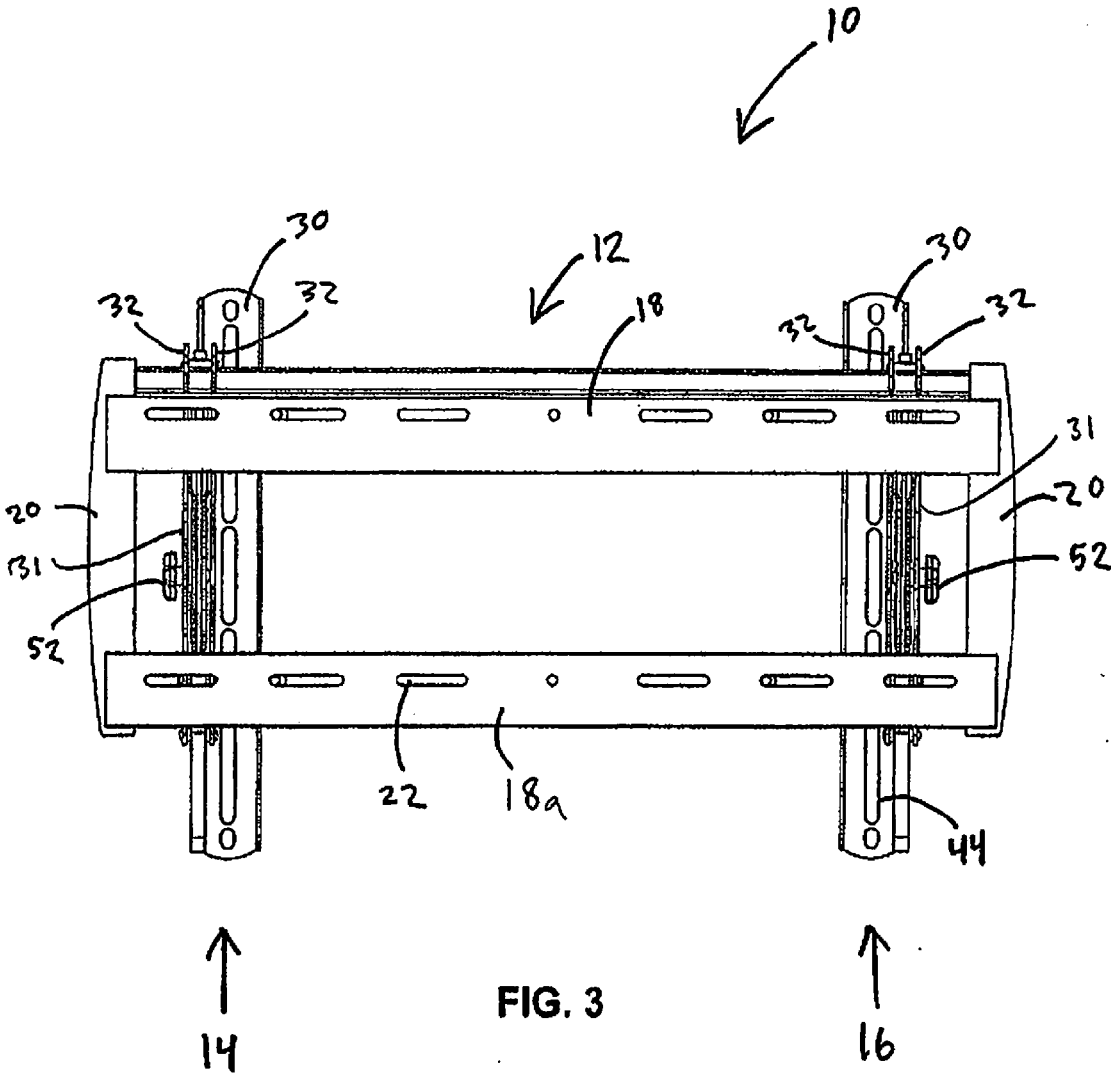


FIG. 3

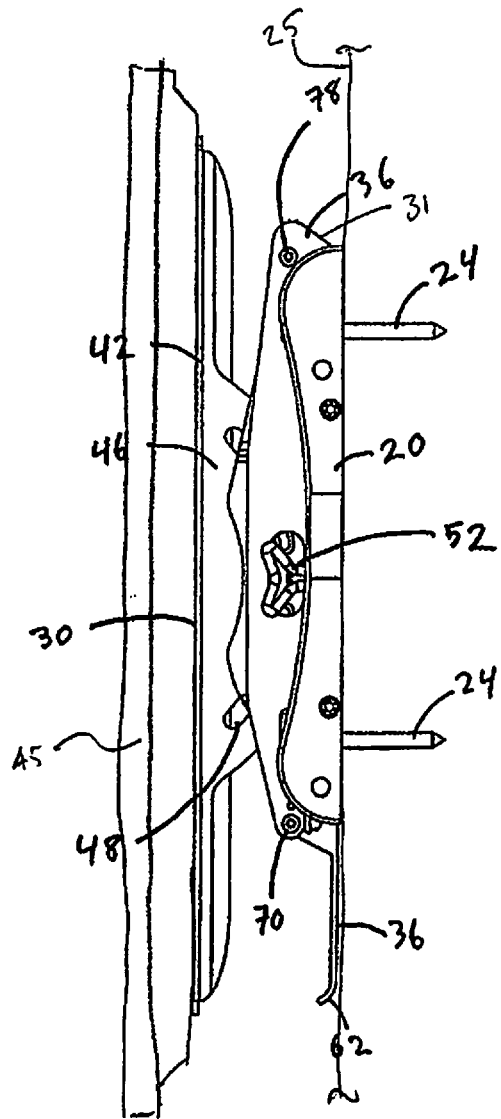


FIG. 4

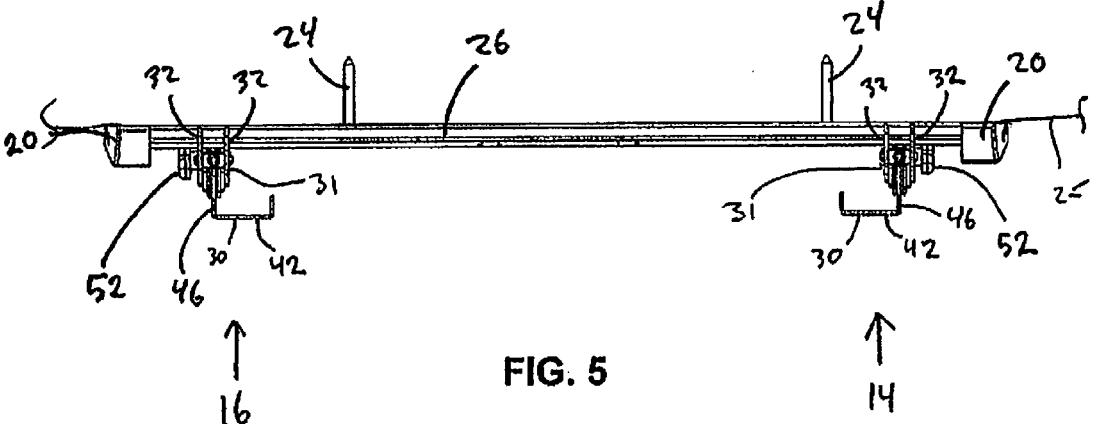


FIG. 5

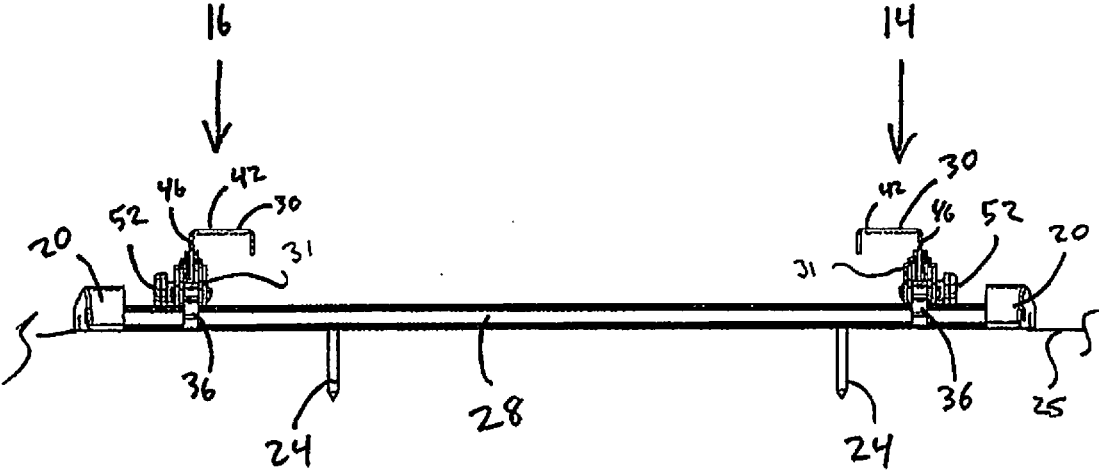


FIG. 6

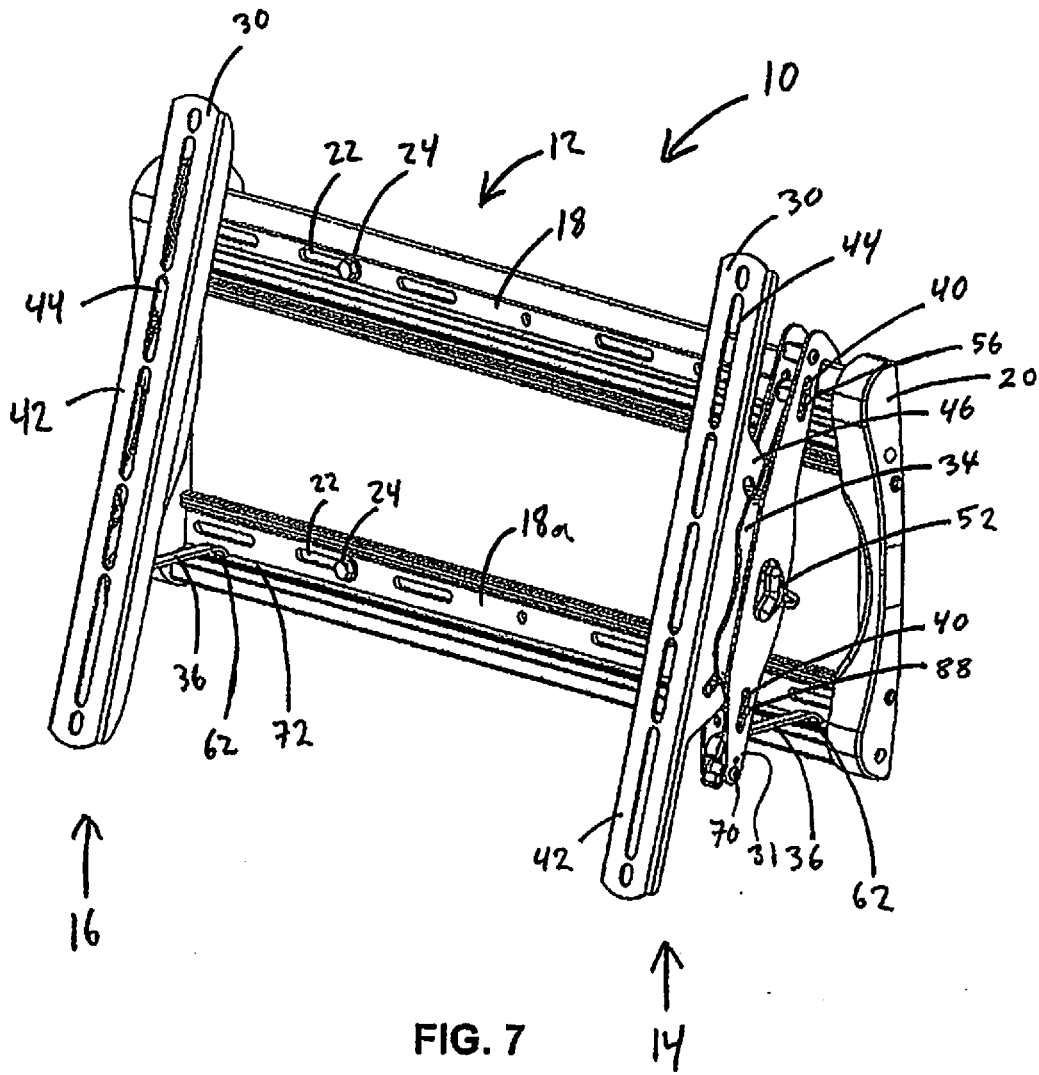


FIG. 7

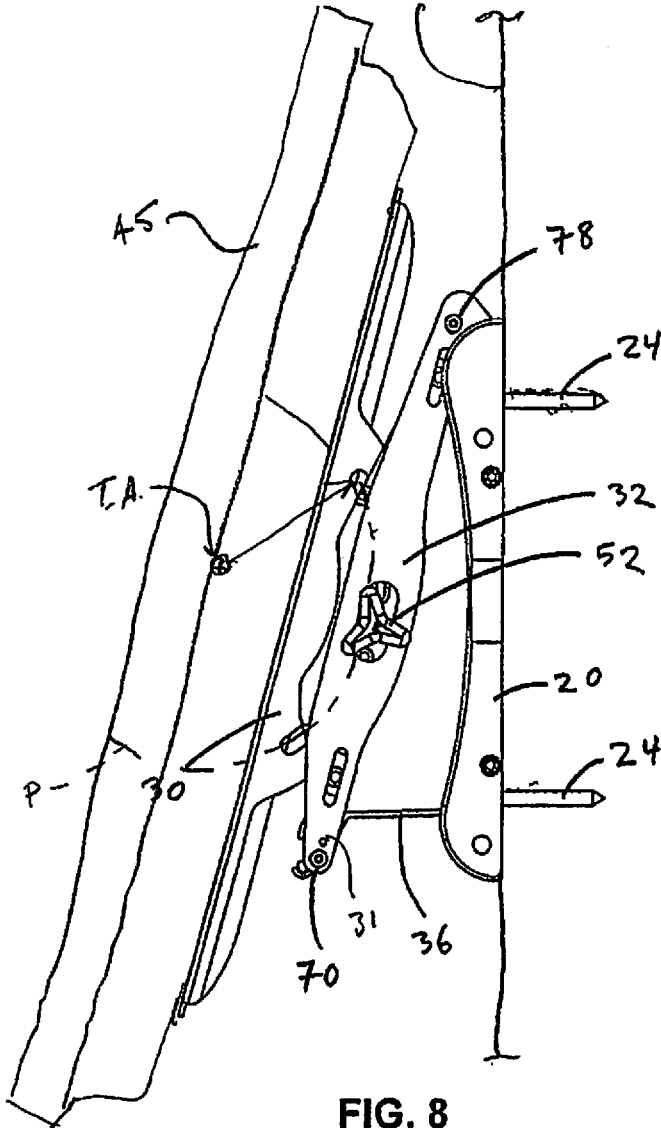


FIG. 8

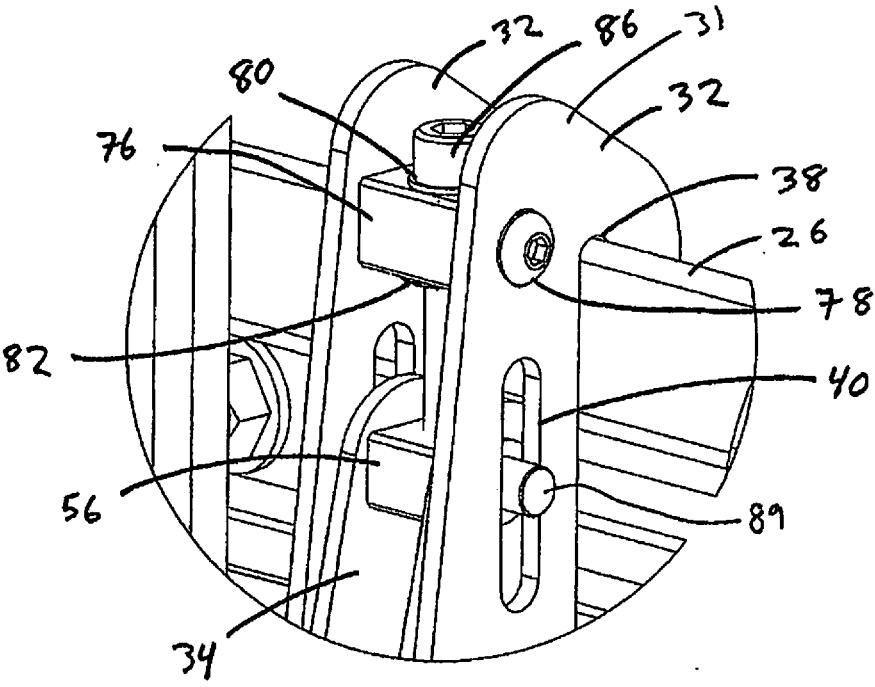


FIG. 9

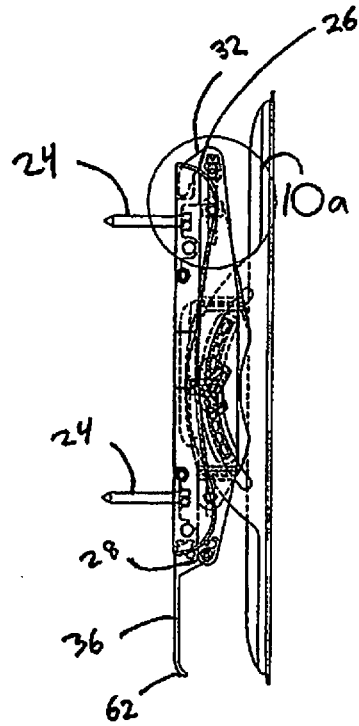


FIG. 10

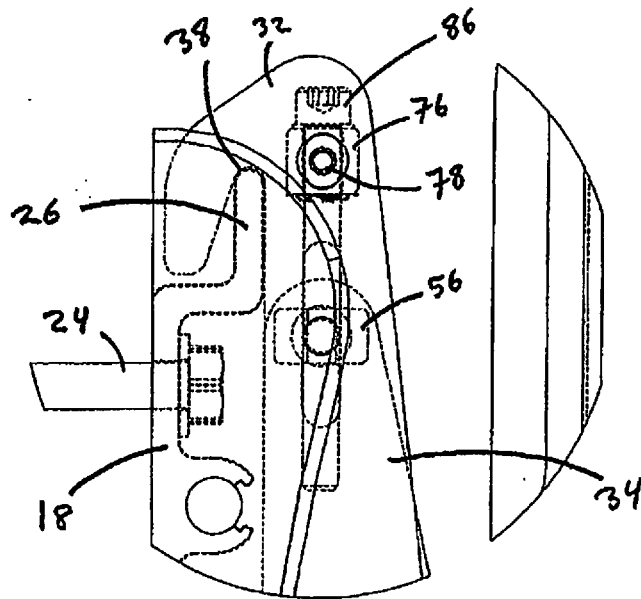


FIG. 10a

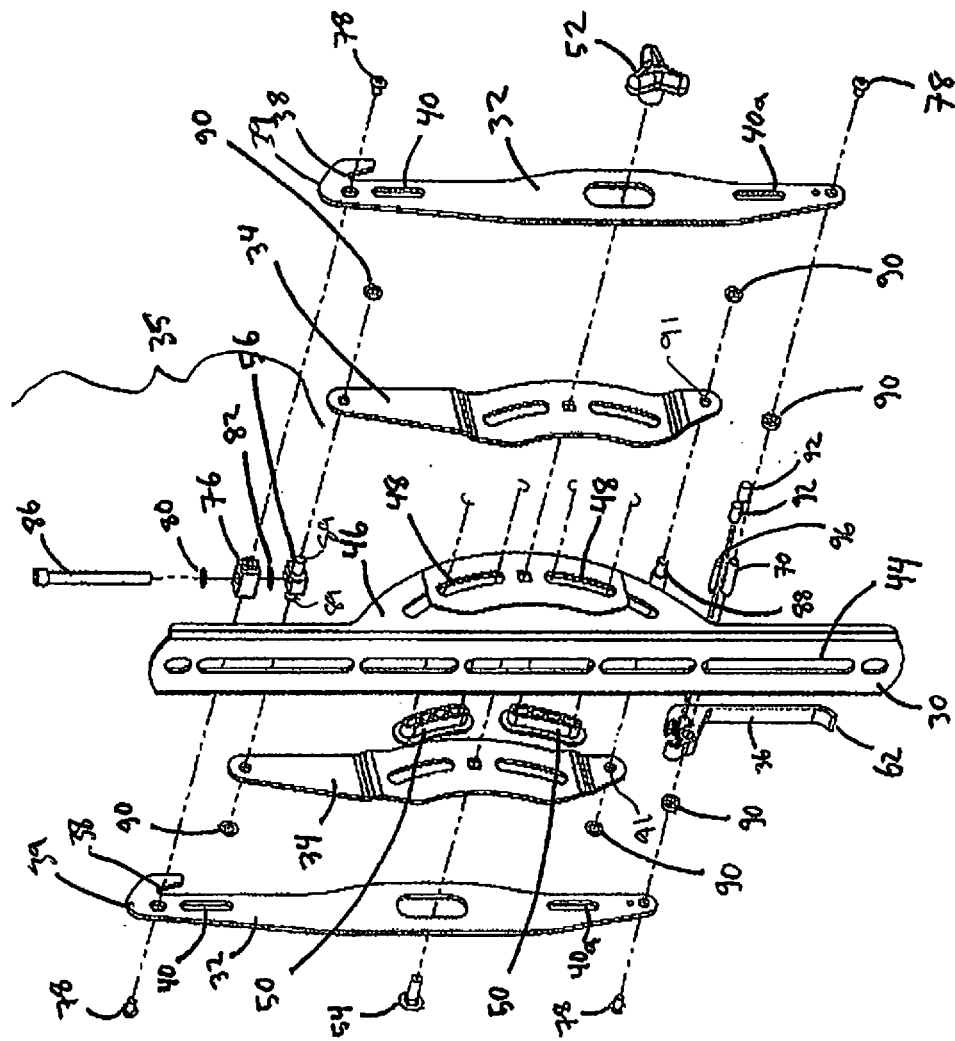


FIG. 11a

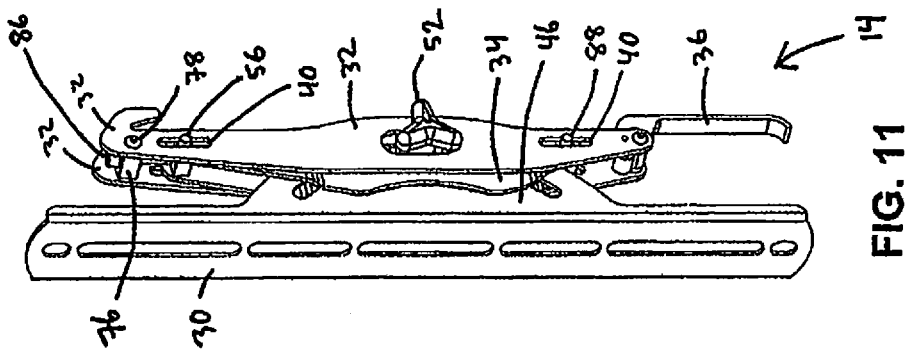


FIG. 11

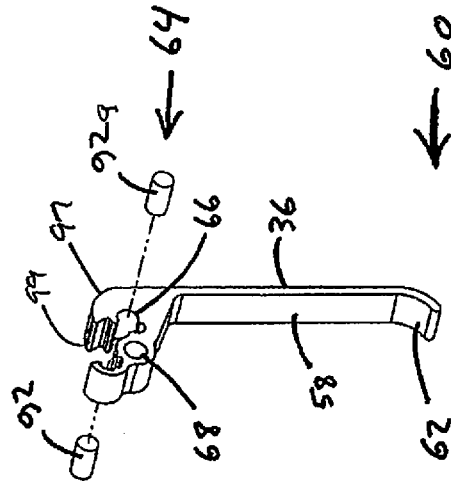


FIG. 12a

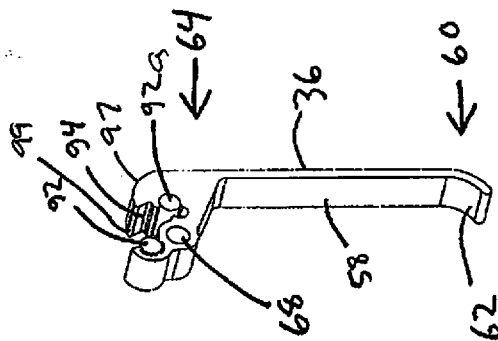


FIG. 12

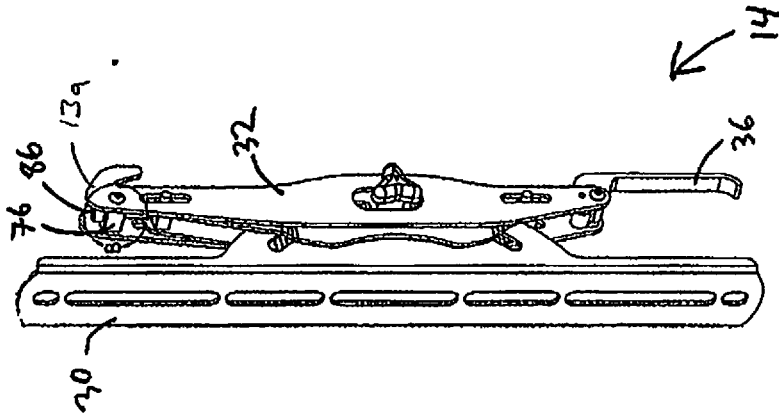


FIG. 13

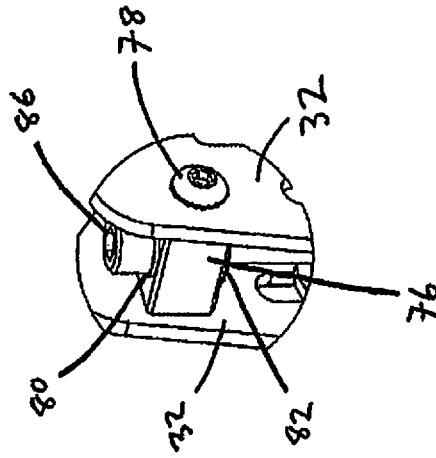


FIG. 13a

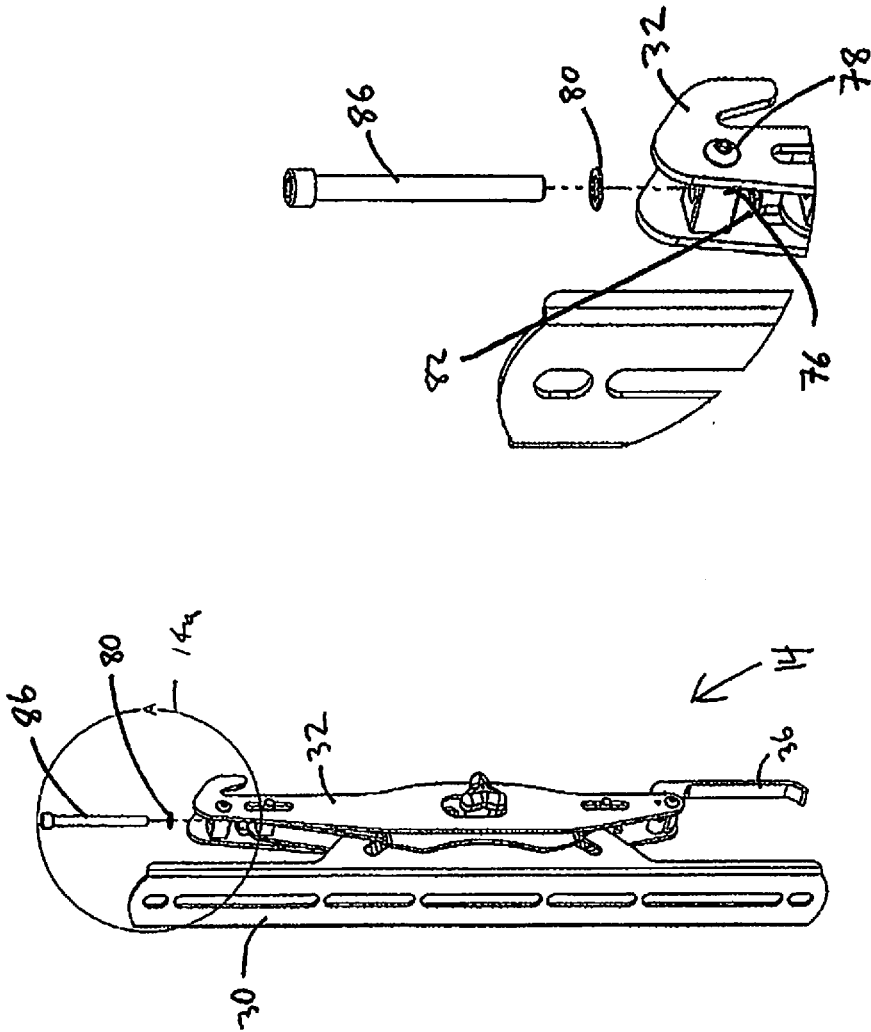


FIG. 14a

FIG. 14

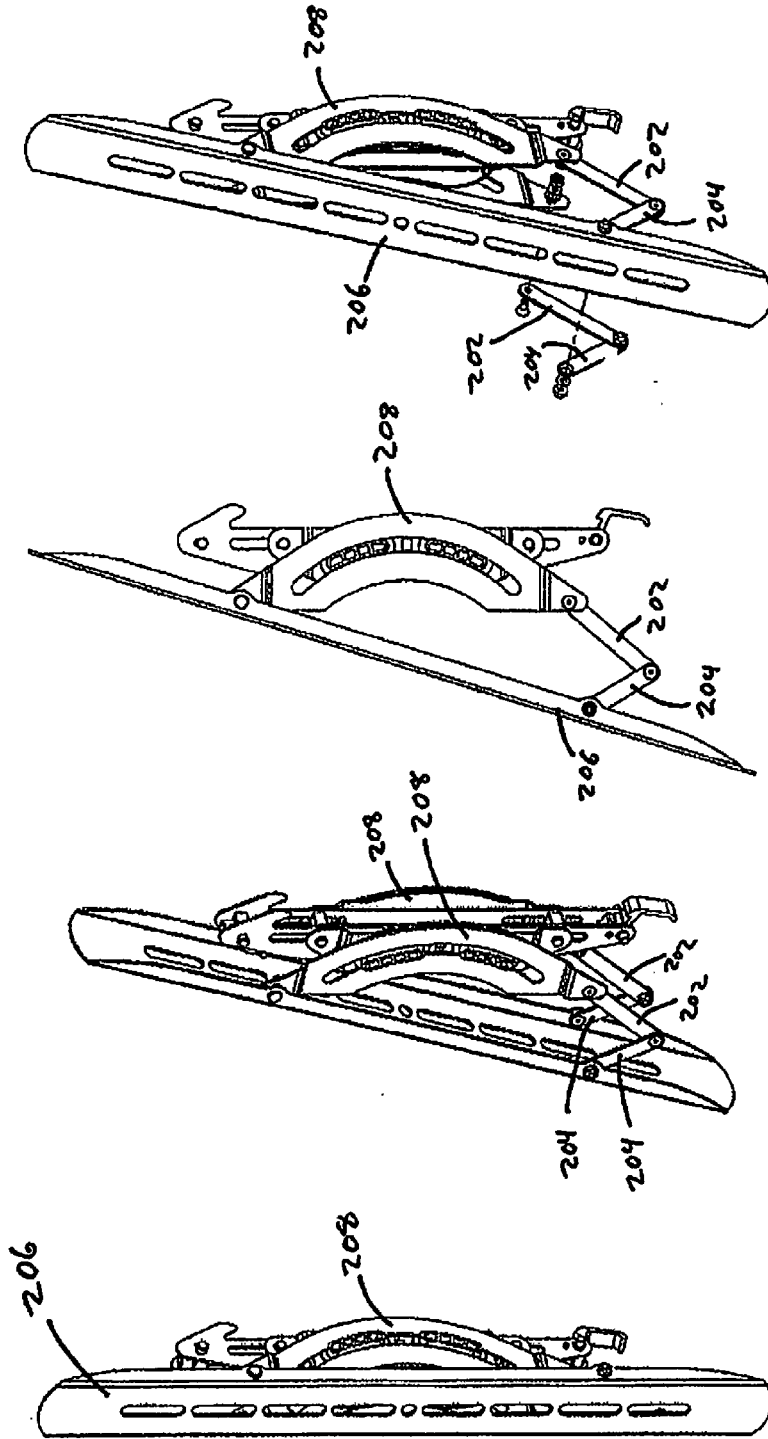


FIG. 15d

FIG. 15c

FIG. 15b

FIG. 15a

FIG. 16f

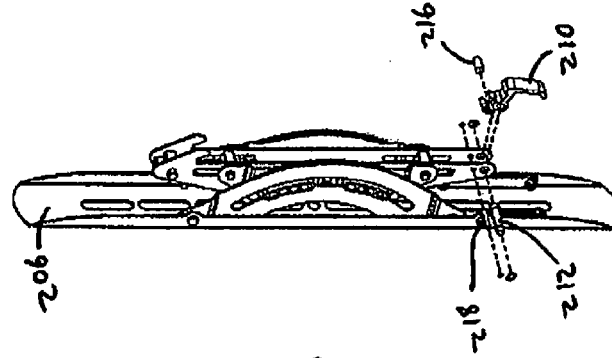
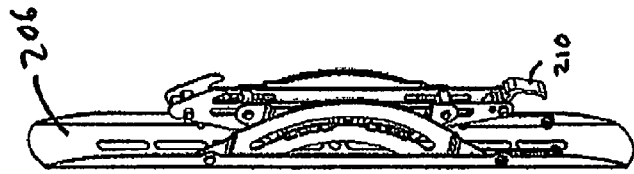
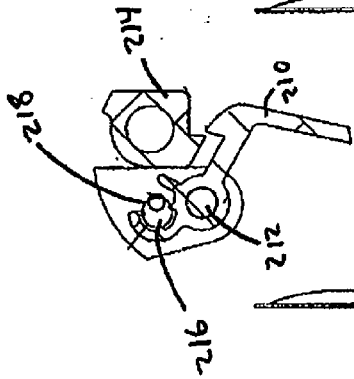


FIG. 16a

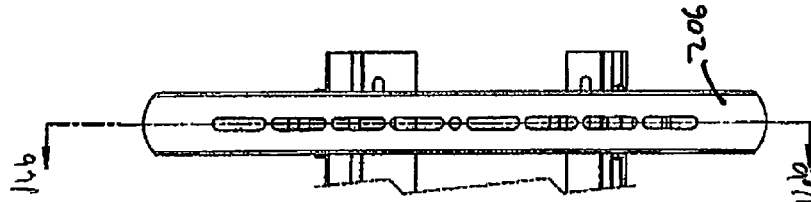


FIG. 16b

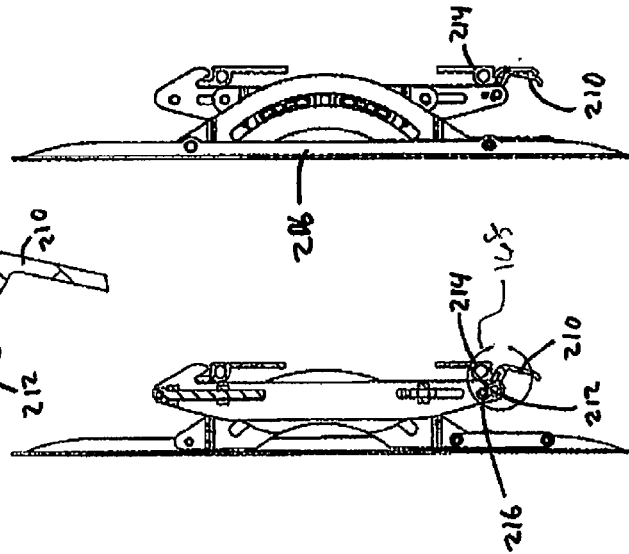


FIG. 16c

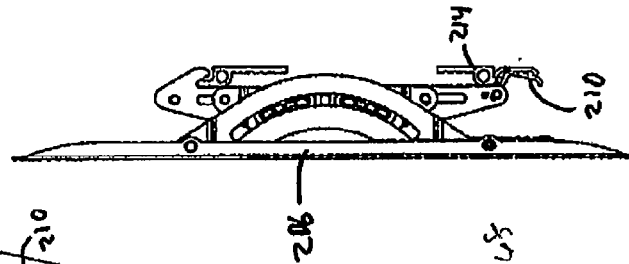


FIG. 16d

FIG. 16e

FIG. 16f

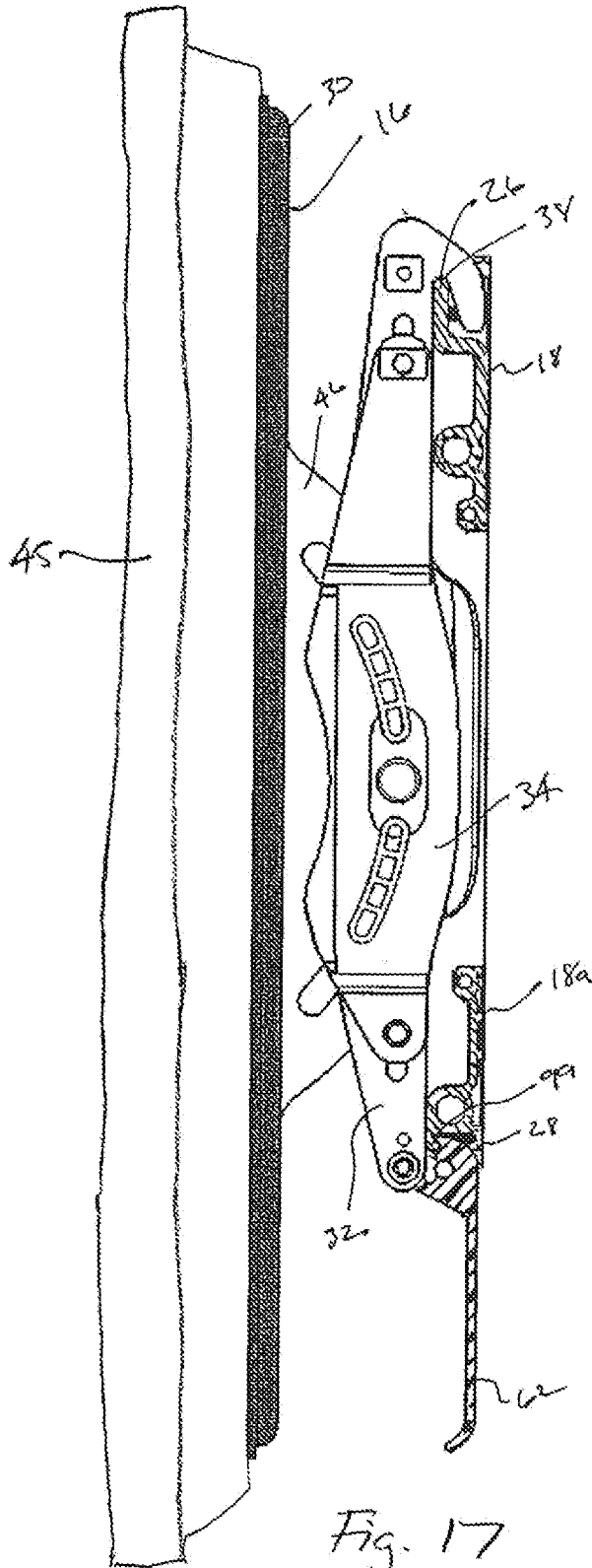


Fig. 17

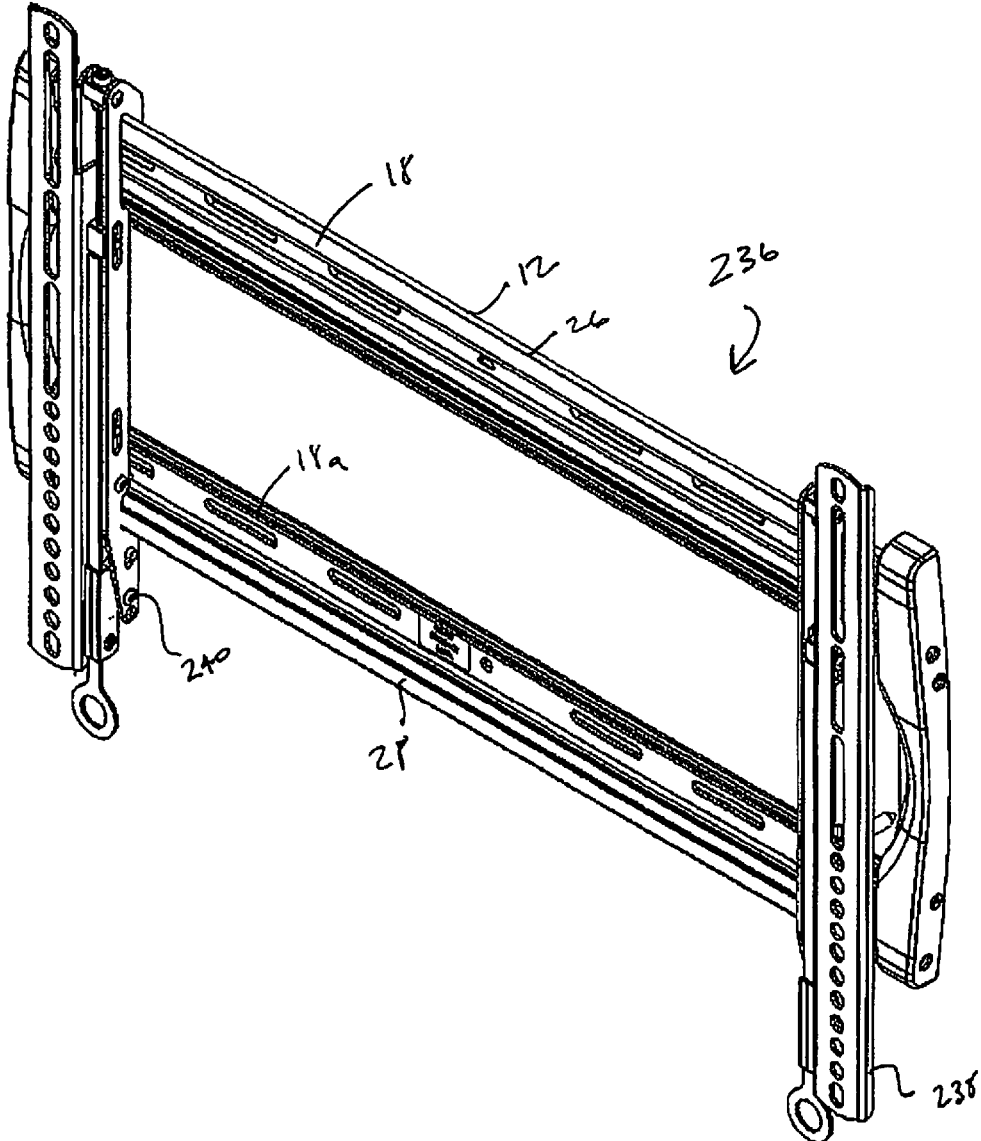


Fig. 18

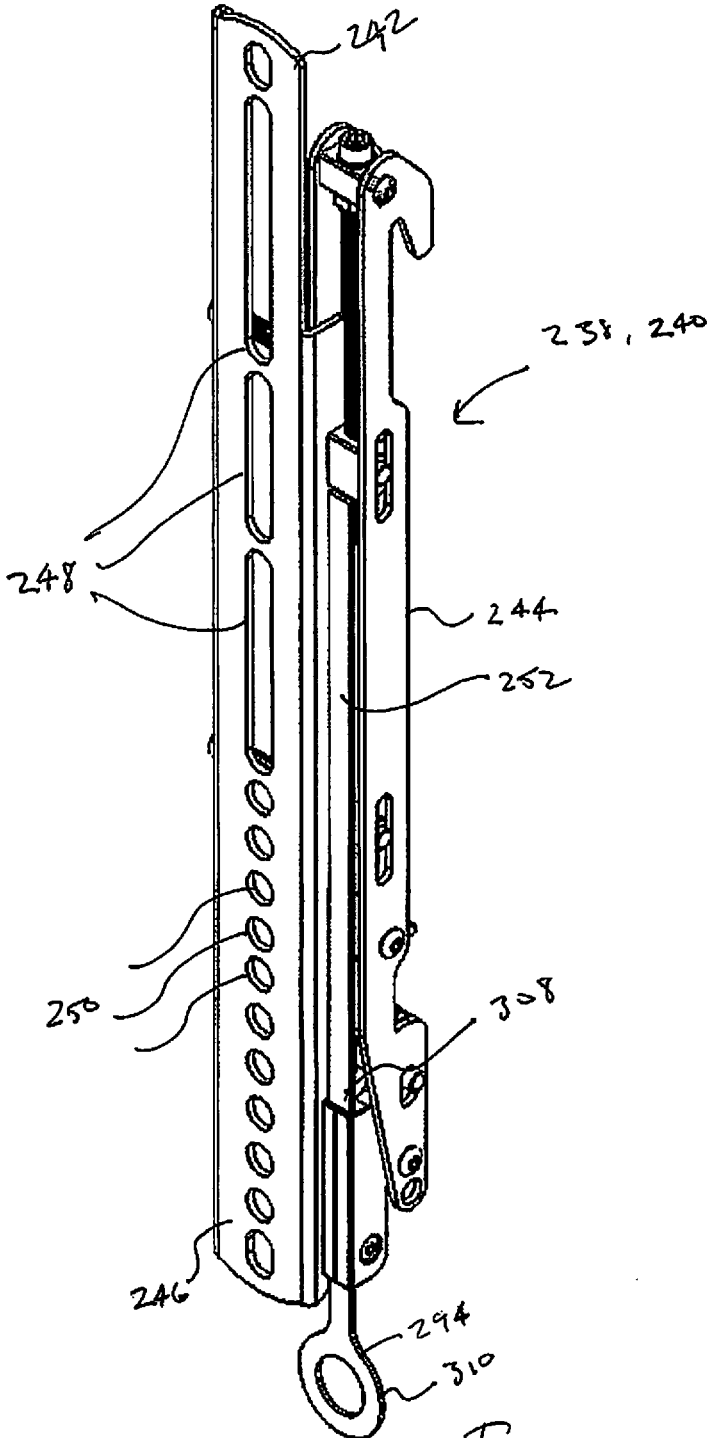


Fig. 19

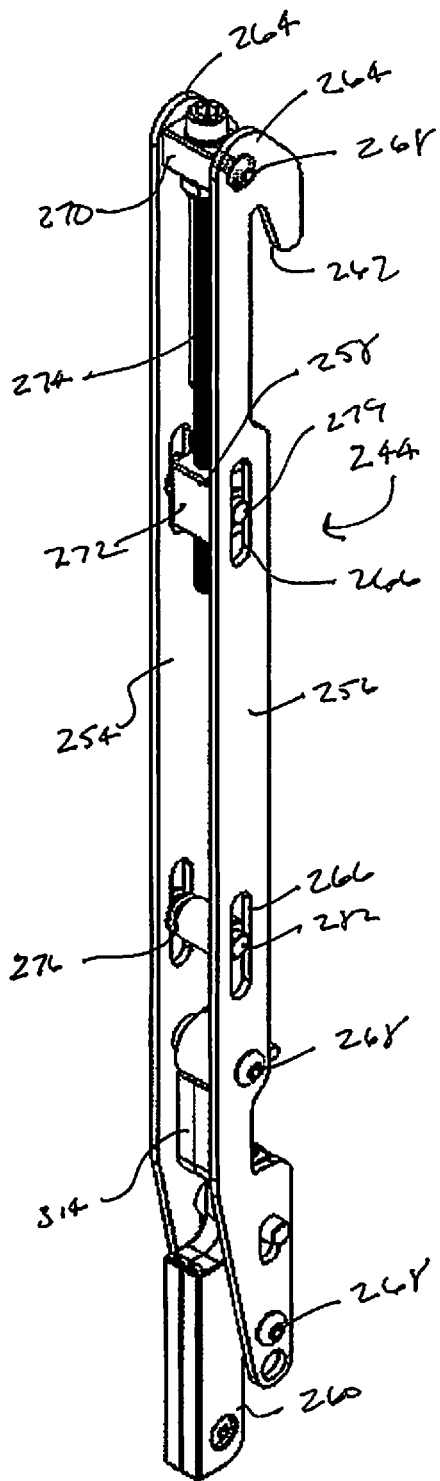


Fig. 20

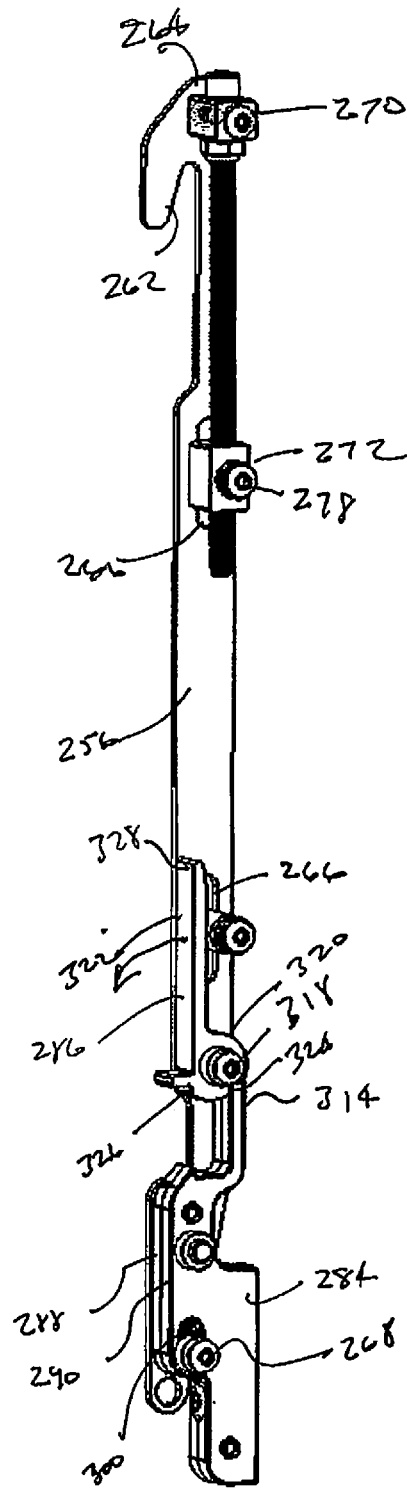


Fig. 21

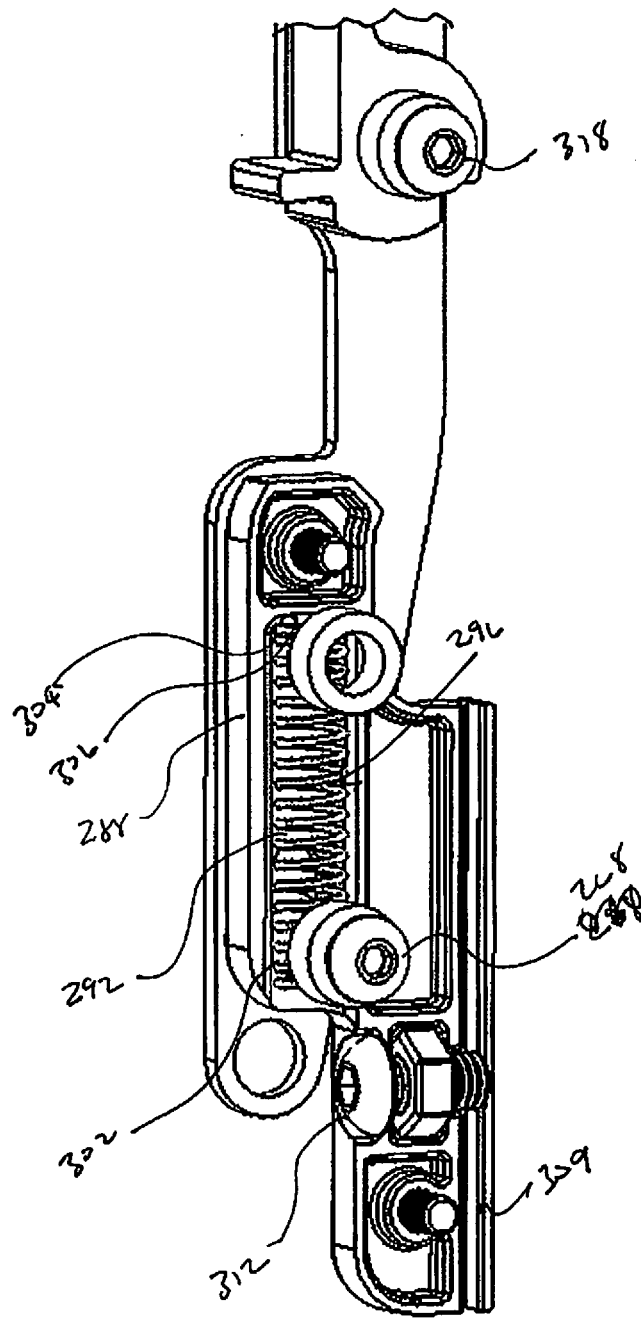


Fig. 22

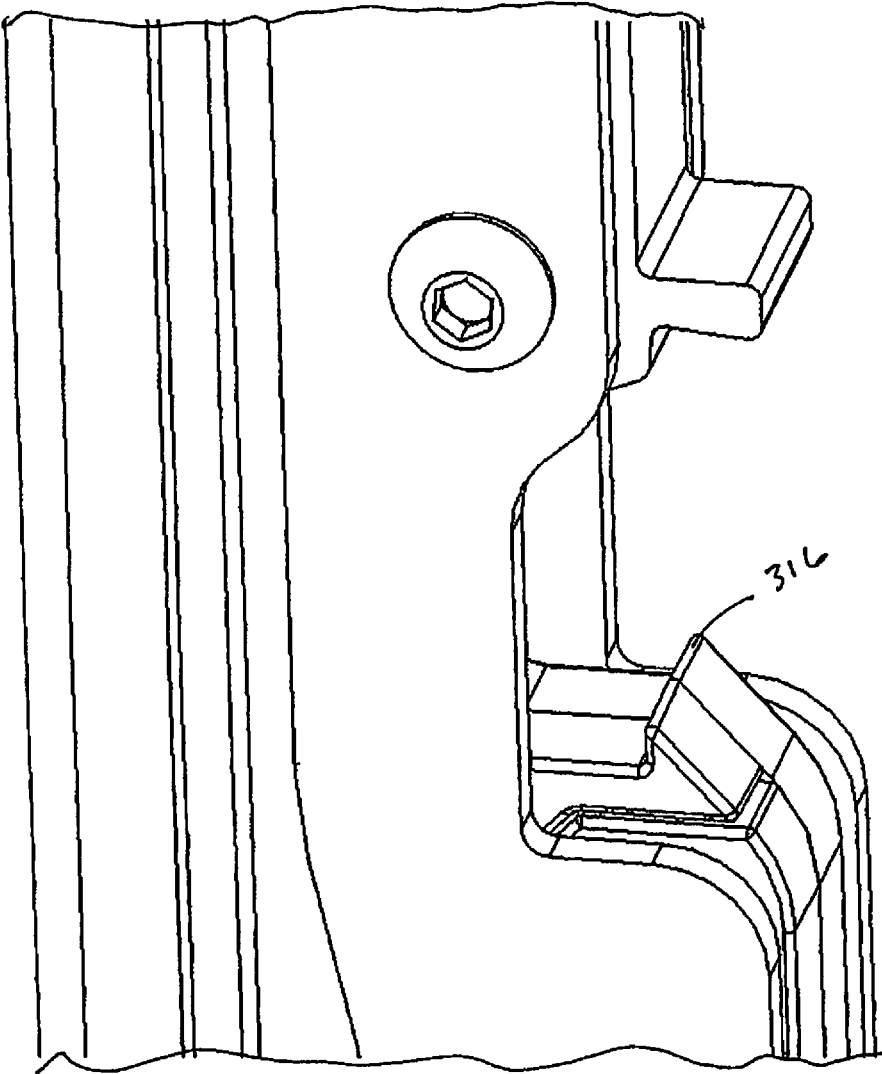


Fig. 23

DISPLAY WALL MOUNT WITH ELASTOMERIC SPRING LATCH

RELATED APPLICATIONS

[0001] This application is a continuation of application Ser. No. 12/675,384 filed Aug. 3, 2010, now U.S. Pat. No. 8,456,808 issued Jun. 4, 2013, which in turn is a 371 U.S. National Stage Application of PCT/US2008/075546, filed Sep. 8, 2008, which claims the benefit of U.S. Provisional Patent Application No. 60/970,429, filed Sep. 6, 2007, and which also claims the benefit of U.S. Provisional Application No. 61/019,126, filed Jan. 4, 2008, each of which is hereby fully incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates generally to mounts for video display devices, and more particularly to mounts for flat panel displays.

BACKGROUND OF THE INVENTION

[0003] Flat panel monitors and televisions have become highly popular and widely used throughout commercial, business, and residential environments. These flat panel displays enable an enhanced viewing experience with layout versatility, space savings, and the ability to replace bulky computer monitors and televisions with displays that are merely a fraction of the depth and weight of similar prior displays of identical screen size.

[0004] The dimensional characteristics of the displays allow them to be conveniently hung on a wall or connected to a mounting surface such as a column, post, or flat surface of a piece of furniture. It is preferable for aesthetic reasons that the display be mounted as closely as possible to the surface in order to achieve the appearance of a framed item such as a photograph or painting. Further, it is often desirable to be capable of readily adjusting the orientation and position of the flat panel display relative to the surface. Versatility of movement of the mount is key to achieving a device that is positioned exactly in the most functional or aesthetically pleasing location desired by the user. Such versatility is particularly desirable as the unique characteristics of a wall or mounting surface may dictate the location where the mount may be attached.

[0005] Many prior mounts have been somewhat difficult to install and adjust as access to the area behind a flat panel display is often very limited during and after the installation process. Moreover, because many larger displays are heavy and hard to lift and position, it is very difficult to make mounting modifications during installation without completely removing the display from the wall.

[0006] Therefore, there is a need for a display mount with enhanced versatility of positioning and adjustment. Likewise, an improved display mount that is easy to install, use, retain in a stable configuration, and which provides necessary access to the rear of the display is desired.

SUMMARY OF THE INVENTION

[0007] The present invention addresses the need of the industry for a flat panel display mount that provides enhanced versatility of movement and ease of installation, maintenance, and manipulation. According to embodiments of the invention, a mount for attaching an electronic display to a wall includes a support structure adapted to attach to the wall

and presenting a pair of vertically spaced-apart generally horizontally oriented flanges. The mount further includes a pair of display interface brackets, each of the display interface brackets including a display interface portion adapted to attach to the electronic display, and a hook bracket assembly operably coupled to the display interface bracket. The hook bracket assembly presents a hook selectively engagable over an upper one of the flanges of the support structure to hang the display interface brackets and the display from the support structure and further includes a vertical position adjustment assembly operably coupled to the display interface bracket. The vertical position adjustment assembly enables selective vertical positioning of the display interface portion and the display relative to the support structure.

[0008] In embodiments of the invention, the vertical position adjustment assembly includes an adjustment screw and a traveling block with the traveling block operably coupled to the display interface bracket. The hook bracket assembly may further include a latch assembly for latching the display interface bracket to a lower one of the flanges of the support structure. The latch assembly may include a vertically slidable housing selectively shiftable between a first latched position in which a tab portion of the housing is engaged behind the lower one of the flanges of the support structure, and a second unlatched position in which the tab portion is clear of the lower one of the flanges to enable the display interface bracket to be disengaged from the support structure. The latch assembly may include a spring biasing the housing toward the latched position, and a kickstand selectively shiftable between a first position in which an end of the kickstand is engaged with the support structure to prop a bottom edge of the display away from the wall, and a second position in which the kickstand is clear of the support structure to enable the latch assembly to be engaged with the support structure.

[0009] In embodiments, the latch assembly may include a handle structure pivotally coupled to the hook bracket assembly, the handle structure defining a groove for engaging the lower one of the flanges of the support structure. The handle structure is selectively shiftable between a first latched position in which the groove is engaged with the lower one of the flanges of the support structure to latch the display interface bracket to the support structure, and a second unlatched position in which the groove is clear of the lower one of the flanges of the support structure to enable the display interface bracket to be disengaged from the support structure. The mount may further include a spring arranged to bias the handle toward the latched position. The spring may be made from elastomeric polymer material.

[0010] In embodiments, the handle structure may be selectively shiftable to a third kickstand position in which the handle is engaged with the support structure to prop a bottom edge of the display away from the wall. The mount may include spring arranged to bias the handle structure away from the kickstand position.

[0011] In further embodiments, an electronic display system mountable on a wall of a structure includes an electronic display and a mount. The mount includes a support structure adapted to attach to the wall and presenting a pair of vertically spaced-apart generally horizontally oriented flanges and a pair of display interface brackets. Each of the display interface brackets includes a display interface portion adapted to attach to the electronic display, and a hook bracket assembly operably coupled to the display interface bracket. The hook bracket assembly presents a hook selectively engagable over

an upper one of the flanges of the support structure to hang the display interface brackets and the display from the support structure and a vertical position adjustment assembly operably coupled to the display interface bracket. The vertical position adjustment assembly enables selective vertical positioning of the display interface portion and the display relative to the support structure.

[0012] In further embodiments, a mount for attaching an electronic display to a wall includes a support structure adapted to attach to the wall. The support structure presents a pair of vertically spaced-apart generally horizontally oriented flanges. The mount further includes a pair of display interface brackets, each of the display interface brackets including a display interface portion adapted to attach to the electronic display and a hook bracket assembly operably coupled to the display interface bracket. The hook bracket assembly presents a hook selectively engagable over an upper one of the flanges of the support structure to hang the display interface brackets and the display from the support structure and a latch assembly for latching the display interface bracket to a lower one of the flanges of the support structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The embodiments of the present invention may be more completely understood in consideration of the following detailed description of various embodiments in connection with the accompanying drawings, in which:

[0014] FIG. 1 is a front perspective view of a flat panel display mounting system according to an embodiment of the invention;

[0015] FIG. 2 is a front view of the display mounting system of FIG. 1;

[0016] FIG. 3 is a rear view of the display mounting system of FIG. 1;

[0017] FIG. 4 is a side view of a display mounting system of FIG. 1;

[0018] FIG. 5 is top view of a display mounting system of FIG. 1;

[0019] FIG. 6 is bottom view of a display mounting system of FIG. 1;

[0020] FIG. 7 is a front perspective view of the flat panel display mounting system of FIG. 1 in an angled outwardly projecting kickstand configuration;

[0021] FIG. 8 is a side view of the flat panel display mounting system in the configuration of FIG. 7;

[0022] FIG. 9 is a fragmentary view of an inset portion of FIG. 1;

[0023] FIG. 10 is a left side phantom view of the display mounting system of FIG. 1;

[0024] FIG. 10a is a view of the inset portion 10a of FIG. 10;

[0025] FIG. 11 is a perspective view of an assembled right mounting bracket of the flat panel mounting system;

[0026] FIG. 11a is an exploded view of the right mounting bracket of the flat panel mounting system depicted in FIG. 11;

[0027] FIG. 12 is a fragmentary perspective view of a latch assembly of the mount of FIG. 1;

[0028] FIG. 12a is an exploded view of the assembly of FIG. 12;

[0029] FIG. 13 is a perspective view of a bracket assembly of the mount of FIG. 1;

[0030] FIG. 13a is a view of the inset portion 13a of FIG. 13;

[0031] FIG. 14 is an exploded perspective view of a bracket assembly of the mount of FIG. 1;

[0032] FIG. 14a is a view of the inset portion 14a of FIG. 14;

[0033] FIG. 15a is a front perspective view of a bracket assembly according to an alternative embodiment of the invention;

[0034] FIG. 15b is a rear perspective view of the bracket of FIG. 15a depicted in a partially extended kickstand position;

[0035] FIG. 15c is a side elevation view of the bracket of FIG. 15b;

[0036] FIG. 15d is a partially exploded view of the bracket of FIG. 15a;

[0037] FIG. 16a is a front elevation view of a bracket assembly according to another alternative embodiment of the invention;

[0038] FIG. 16b is a cross-sectional view taken at section 16b-16b of FIG. 16a;

[0039] FIG. 16c is a side elevation view of the bracket of FIG. 16a;

[0040] FIG. 16d is a rear perspective view of the bracket of FIG. 16a;

[0041] FIG. 16e is an exploded view of the bracket of FIG. 16d;

[0042] FIG. 16f is a view of the inset portion 16f of FIG. 16b;

[0043] FIG. 17 is a cross-sectional view taken at section 17-17 of FIG. 2;

[0044] FIG. 18 is a front perspective view of a mount according to an alternative embodiment of the invention;

[0045] FIG. 19 is a front perspective view of a display interface bracket of the mount of FIG. 18;

[0046] FIG. 20 is a cutaway view of the display interface bracket of FIG. 19;

[0047] FIG. 21 is a further cutaway view of the opposite side of the display interface bracket of FIG. 19;

[0048] FIG. 22 is a fragmentary cutaway view of the spring latch portion of the display interface bracket of FIG. 19; and

[0049] FIG. 23 is a fragmentary perspective view of a top edge of the spring latch portion of the display interface bracket of FIG. 19.

[0050] While the present invention is amendable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the present invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0051] Embodiments of the present invention relate to display mount systems for attaching a flat panel electronic display to a fixed structure. Such flat panel displays include plasma displays, liquid crystal displays (LCDs), or any other kind of electronic display that is of similar dimensions or characteristics. Fixed structures generally refer to walls, but also may include ceilings, beams, columns, pieces of furniture, booths, or any other fixed or permanent structure to which a display mount might be attached.

[0052] An embodiment of a display wall mount 10 is depicted in FIGS. 1 through 14a. Display wall mount 10 generally includes support assembly 12 and first and second

display interface bracket assemblies **14**, **16**. Support assembly **12** generally includes two parallel, transversely disposed, spaced-apart supports **18**, **18a**, that are fixed together at their ends by vertical support members **20**. Supports **18**, **18a**, define a series of openings **22** that receive fasteners **24** to mount supports **18**, **18a**, to a wall **25** or other fixed structure. Supports **18**, **18a**, define upper and lower flanges **26**, **28**, respectively, spanning the length of supports **18**, **18a**. Flanges **26**, **28**, are offset from the wall **25** or support structure to receive hooks and latches of bracket assemblies **14**, **16**, to attach bracket assemblies **14**, **16**, thereto.

[0053] Each bracket assembly **14**, **16**, generally includes display interface bracket **30**, and hook bracket assembly **31**. Display interface bracket **30** presents front plane **42** which defines a plurality of slots **44** for mounting to a flat panel display **45**. Flange portion **46** extends rearwardly from front plane **42** along the one edge of bracket **30**. Flange portion **46** defines a pair of arcuate slots **48** which define a range of tilting motion of the bracket **30**.

[0054] Hook bracket assembly **31**, as depicted in the exploded view of FIG. **11a**, generally includes parallel hook flanges **32**, carrier brackets **34**, vertical position adjustment assembly **35**, and latch/kickstand assembly **36**. Each of hook flanges **32** generally defines hook portion **38** at upper end **39** and guide slots **40**, **40a**. Hook flanges **32**, are fastened together with fasteners **78** in a parallel spaced apart relationship with vertical position adjustment assembly **35**, and latch/kickstand assembly **36** sandwiched in between.

[0055] Vertical position adjustment assembly **35** generally includes head block **76**, traveling block **56**, adjustment screw **86**, and guide pin **88**. Adjustment screw **86** is received through head block **76**, but is not threadedly engaged therewith, enabling adjustment screw **86** to rotate without translating vertically. Adjustment screw **86** is threadedly engaged with traveling block **56** such that traveling block **56** translates vertically as adjustment screw **86** is rotated. Carrier brackets **34** are received between hook flanges **32** and traveling block **56** and are coupled to traveling block **56** on guide pins **89**. Guide pins **89** are free to translate vertically in guide slots **40**, with nylon washers **90** being provided to reduce friction. The ends of guide pin **88** extend through aperture **91** in each of carrier brackets **34**. Guide pin **88** is also free to translate vertically in guide slots **40a**, with nylon washers **90** being again provided to reduce friction.

[0056] FIG. **9** is a detail view of the inset portion (**9**) of FIG. **1**, depicting a portion of the vertical position adjustment assembly **35** of the display mount. While the height of the display mount will largely be determined by the mounting height of the support plates **18**, this vertical position adjustment assembly **35** allows a range of height adjustment that is especially useful for precise vertical position adjustment within fractions of an inch. As there is a vertical position adjustment assembly **35** associated with each bracket assembly **14**, **16**, the vertical position adjustment assembly **35** may be utilized for precise leveling of display **45** as well by separately adjusting the vertical position adjustment assembly **35** of each bracket assembly **14**, **16**.

[0057] Each carrier bracket **34** defines guide slots **48**. Glides **50** are engaged and slidable within slots **48** to enable tilting movement of bracket **30** with respect to hook bracket assembly **31**. Knob **52** is provided on bolt **54** that passes through arcuate slots **48** and glides **50**. Knob **52** may be tightened and loosened as desired to add or remove friction resisting tilting adjustment of bracket **30** and a display **45**

attached thereto. It will be appreciated that guide slots **48** may be configured so as to define and arcuate path of travel **P** about a tilt axis **A** (depicted in FIG. **8**) extending through display **45** forward of front plane **42**. Display **45** may thereby be self-balancing so as to maintain any desired tilt position. One such self balancing configuration is described in U.S. Pat. No. 7,152,836, owned by the owners of the present invention, and hereby fully incorporated herein by reference.

[0058] Latch/kickstand assembly **36** generally includes elongate portion **58** with a first free end **60** having handle portion **62** and second pivoting end **64** defining recess **66** and aperture **68**. FIGS. **12** and **12a** respectively depict fragmentary assembled and exploded views of the assembly **36**. The shape of the interior grooves of the pivotal end **62** are shaped to receive elastomeric spring members **92**, which may be made from urethane foam material. Latch pivot pin **70** extends through aperture **68** to pivotally attach assembly **36** between parallel hook flanges **32**. Groove **94** is defined in second end **64** for receiving bump pin **96** extending between parallel hook flanges **32**.

[0059] Latch/kickstand assembly **36**, as depicted in FIGS. **1-6**, functions to latch the bottom of the bracket assembly **14**, **16**, to the lower flange **28** of support assembly **12**. This assembly **36** enables a user to quickly and efficiently secure the mount and corresponding flat panel display in the desired position by simply hooking the parallel hook flanges **32** on the upper flange **26** of the support assembly **12**, adjusting the height and angle of the flat panel display, and engaging groove **94** with bottom flange **28** of support assembly **12**.

[0060] FIGS. **7** and **8** depict an additional, particularly useful configuration that may be utilized during mount installation, adjustment, maintenance, or particularly for temporary access to the back panel of a mounted flat panel display for attaching cables and wires. In this configuration, handle **62** is pivoted around latch pivot pin **70** approximately ninety degrees, such that handle **62** is engaged with groove **72** on support **18a**. In this position, handle **62** functions as a kickstand to prop-up the bottom of display **45**, thereby enabling easy access to the back of display **45** for connecting wires and cables. Further, this configuration is especially useful for making adjustments when a user is in the process of installing a display. Because large flat panel displays are often very heavy and awkward to hold, it can be difficult to connect wires and cables to connectors on the back of the display while the display is disengaged from the mount. This kickstand feature provides the capability of connecting wires and cables with the display already mounted, but without having the display located an excessive distance from the wall

[0061] The components of latch/kickstand assembly **36** operate together to function as a spring-biased mechanism, biasing handle portion **62** to a vertically disposed position (as seen in FIGS. **1-6** for example). This vertical position biasing is maintained whether the latch is pivoted forward or rearward around the latch pivot pin **70**. When handle **62** is disposed in a vertical position, spring members **92**, **92a**, are aligned adjacent to the bump pin **96**. Rotating handle **62** rearward, as when an operator places the latch in the kickstand position, causes the bump pin to be meshed against the lower spring member **92a** resulting in a biasing force against such movement. Rotating the handle **62** forward from the vertical position, as when groove **94** is to be engaged around lower flange **28** of support **18a**, causes the bump pin **96** to be meshed against the upper spring member **92** resulting in a biasing force against such movement. This spring biasing arrangement is useful as

this causes handle 62 in the kickstand position to immediately resume a vertical orientation when removed from the groove 72 of the support 18a.

[0062] This spring-biasing arrangement also is useful when bracket assemblies 14, 16, are pushed against lower flange 28 of support 18a to latch bracket assemblies 14, 16, in place. Rounded edge 97 rides up and over flange 28 against the bias of lower spring member 92a as bracket assembly 14, 16, is advanced inward onto flange 28. Once tip 99 is inward of flange 28, spring member 92a urges handle 62 toward the vertical position, “clicking” groove 94 into engagement with flange 28.

[0063] In use, bracket assemblies 14, 16, are attached to the rear of a flat panel display device 45 with fasteners through apertures 44, in display interface bracket 30. Hooks 38 are engaged over upper flange 26 of support assembly 12 in order to suspend the assembly of the flat panel display and bracket assemblies 14, 16, on the wall. Handle 62 may be rotated about pivot pin 70 so that handle 62 extends horizontally outward to engage groove 72 on support 18a. In this position, the bottom of the flat panel display 45 is held in the kickstand position away from the wall as depicted in FIG. 8 to enable connection of wires and cables to the back of the display. Once connection of wires, and any other desired work, is complete, the bottom of display 45 may be lifted away from the wall slightly. The bias provided by lower spring member 92a rotates handle 62 to a vertical position. As the bottom ends of bracket assemblies 14, 16, swing toward the wall, rounded edge 97 rides up and over flange 28 against the bias of lower spring member 92a as bracket assembly 14, 16, is advanced inward onto flange 28. Once tip 99 is inward of flange 28, spring member 92a urges handle 62 toward the vertical position, “clicking” groove 94 into engagement with flange 28, and thereby latching bracket assemblies 14, 16, to support 12.

[0064] The height of the display above a floor surface can be independently adjusted at each of bracket assemblies 14, 16, by rotating adjustment screw 86. As adjustment screw 86 is rotated, bracket 30 and display 45 which is attached thereto are translated up or down relative to support 12. Further, the display can be leveled laterally by adjusting either or both of the adjustment screws 86 of bracket assemblies 14, 16, independently. The display 45 may be easily dismounted by rotating handle 62 against the bias of spring member 92a until tip 99 clears flange 28, pulling horizontally outward on the bottom of the display 45, and then lifting upward on the display 45 to disengage hooks 38 from upper flange 26.

[0065] FIGS. 10 and 10a respectively set forth a phantom left side view of mount 10, and a close-up detail view of the view of FIG. 10. FIG. 10 depicts the relative engagement locations of the parallel hook flanges 32 to the upper flange portion 26 of the support plates 18, 18a, as well as the location of latch/kickstand assembly 36 in latched position relative to lower flange 28 of support 18s. Fasteners 24 are seen in the recessed portion of the support members that are directly adjacent a wall or other support structure. FIG. 10a is a more detailed view of the parallel hook flanges 32 and the vertical position adjustment components. The hooks 38 of parallel hook flanges 32 is seen to be shaped for adjacent engagement with the outside of the upper flange member 26 of support 18. Hook 38 also has an interior curvature which enables parallel hook flanges 32 to be pivoted into engagement or for angled positioning as when the kickstand configuration shown in FIGS. 7 and 8 is being used.

[0066] The assembled view of the bracket assembly depicted in FIG. 11 and the exploded view of the right bracket assembly in FIG. 11a provide a comprehensive layout of the bracket assemblies 14, 16, in this embodiment. FIG. 13a depicts a detail view of the inset portion 13a of FIG. 13. FIG. 14a shows a detail view of the inset portion of FIG. 14. The components are depicted in a partially exploded configuration for clarity.

[0067] FIGS. 15a-d disclose an alternate embodiment of the bracket assembly of the flat panel display mount where two sets of hinged arms 202 and 204 are utilized in place of the kickstand arrangement of the previously disclosed embodiment. The hinged arms 202 and 204 generally form a linkage between an outer bracket member 206 and a pair of side bracket members 208. These hinged arms are pivotally mounted using fasteners and washers at their pivoting ends. These hinged arms allow the bracket assembly to tilt away from the wall or mounting structure to access the back side of a mounted flat panel display and to aid in connecting wires and cables.

[0068] FIGS. 16a-f disclose an alternative embodiment of the bracket assembly of the flat panel display mount where an alternative latching arrangement is disclosed. This arrangement uses a latch 210 which is spring-biased in a single direction. This biasing occurs when the latch 210 is rotated around a latch pivot pin 212 to ride over a ridge on support plate 214 for clipping the latch in place. A urethane dowel 216 functions as a biased spring when compressed against a mounted pin 218. Using this arrangement, the latch 210 is able to open automatically when the bracket 206 is swung down against the wall during mounting and to click into a latched state.

[0069] In FIGS. 18-23 there is depicted a further embodiment enabling a display to be mounted very close to a wall surface. As depicted in FIG. 18, mount 236 generally includes support assembly 12 and display interface brackets 238, 240. Support assembly 12 being previously described, each of display interface brackets 238, 240, as depicted in FIGS. 19-23, generally includes display interface flange 242 and hook bracket assembly 244. Display interface flange 242 has front plane 246 defining a plurality of elongate apertures 248 and round apertures 250 for receiving fasteners (not depicted) to attach display interface bracket 238, 240, to the back of a flat panel display device 45. Additionally, display interface flange 242 has attachment flange 252 extending rearwardly for attaching display interface flange 242 to hook bracket assembly 244.

[0070] Hook bracket assembly 244, depicted in FIGS. 20-23 with portions cut away for clarity, generally includes parallel hook flanges 254, 256, vertical position adjustment assembly 258, and latch/kickstand assembly 260. Each of hook flanges 254, 256, generally defines hook 262 at upper end 264 and guide slots 266. Hook flanges 254, 256, are fastened together with fasteners 268 in a parallel spaced apart relationship with vertical position adjustment assembly 258, and latch/kickstand assembly 260 sandwiched in between.

[0071] Vertical position adjustment assembly 258 generally includes head block 270, traveling block 272, adjustment screw 274, and guide pin 276. Adjustment screw 274 is received through head block 270, but is not threadedly engaged therewith, enabling adjustment screw 274 to rotate without translating vertically. Adjustment screw is threadedly engaged with traveling block 272 such that traveling block 272 translates vertically as adjustment screw 274 is rotated.

Attachment flange 252 is received between hook flange 254 and traveling block 272 and is fixed to traveling block 272 with fastener 278. Fastener 278 and projection 279 are free to translate vertically in guide slots 266. Fastener 280 couples attachment flange 252 with guide pin 276. Fastener 280 and guide pin end 282 are also free to translate vertically in guide slots 266.

[0072] Latch/kickstand assembly 260 generally includes spring latch 284 and kickstand 286. Spring latch 284 is vertically slidably disposed between hook flanges 254, 256, and generally includes housing halves 288, 290, spring 292, and pull handle 294. Housing halves 288, 290, define internal cavity 296 which receives spring 292 therein. Fastener 268 extends through apertures in hook flanges 254, 256, elongate slot 300 defined in housing halves 288, 290. Bottom end 302 of spring 292 bears on fastener 268, while top end 304 of spring 292 bears on inner wall 306, such that spring latch 284 is biased in an upward direction by spring 292. Strap portion 308 is received and trapped in slot 309 defined by housing halves 288, 290. The distance that pull ring portion 310 extends below spring latch 284 can be adjusted by loosening fastener 312, and pulling or pushing strap portion 308 so that pull ring 310 is a desired distance below spring latch 284, and retightening fastener 312. In this way, the position of pull ring 310 can be adjusted so as to be immediately adjacent the bottom edge of a display attached to mount 236.

[0073] Housing half 290 has upwardly projecting tab 314 and also defines upwardly projecting lip 316. Kickstand 286 is pivotally mounted between hook flanges 254, 256, at pivot 318, and generally includes hub 320 and arm 322. Hub 320 defines first shoulder 324 and second shoulder 326. Kickstand 286 is held in a retracted position as depicted in the figures by the engagement of tab 314 with shoulder 324, preventing rotation of kickstand 286.

[0074] In use, display interface brackets 238, 240, are attached to the rear of a flat panel display device with fasteners through apertures 248, 250, in display interface flange 242. Hooks 262 are engaged over upper flange 26 of support assembly 12 in order to suspend the assembly of the flat panel display and display interface brackets 238, 240, on the wall. Spring latch 284 may then be pulled downward against the bias of spring 292. As tab 314 is drawn downward and disengaged from first shoulder 324, kickstand 286 rotates around pivot 318 by gravity (in the direction of the arrow depicted in FIG. 21) so that arm 322 extends horizontally outward. In this position, spring latch 284 may be released so that tab 314

contacts second shoulder 326 to hold kickstand 286 in position and prevent further rotation. End 328 of arm 322 contacts the lower support 18 in this position, thereby holding the bottom of the flat panel display attached to mount 236 away from the wall to enable connection of wires and cables to the back of the display. Once connection of wires, and any other desired work, is complete, kickstand 286 may be rotated in the reverse direction, disengaging tab 314 from second shoulder 326. As the bottom ends of display interface brackets 238, 240, swing toward the wall, upwardly projecting lip 316 rides over flange 28, forcing spring latch 284 downward against the bias of spring 292. Once lip 316 is on the rear side of flange 28, spring latch 284 is urged upward by the bias of spring 292, thereby latching display interface brackets 238, 240, to support 12.

[0075] The height of the display above a floor surface can be independently adjusted at each of display interface brackets 238, 240, by rotating adjustment screw 274. As adjustment screw 274 is rotated, display interface flange 242 and the display attached thereto are translated up or down relative to hook brackets assembly 244 and support 12. Further, the display can be leveled laterally by adjusting either or both of the adjustment screws of display interface brackets 238, 240 independently. The display may be easily dismounted by pulling spring latches 284 downward so that lips 316 clear flange 28, pulling horizontally outward on the bottom of the display, and then lifting upward on the display to disengage hooks 262 from upper flange 26.

[0076] The embodiments above are intended to be illustrative and not limiting. Additional embodiments are encompassed within the scope of the claims. Although the present invention has been described with reference to particular embodiments, those skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. For purposes of interpreting the claims for the present invention, it is expressly intended that the provisions of Section 112, sixth paragraph of 35 U.S.C. are not to be invoked unless the specific terms “means for” or “step for” are recited in a claim.

1. A mount for a electronic display device as disclosed herein and equivalents thereof.
2. A mounting system for an electronic display device as disclosed herein and equivalents thereof.
3. A method for mounting an electronic display as disclosed herein and equivalents thereof.

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