

Patent Application of
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for
Adjustable Flat-Panel Display Mount System

Background – Prior Art

Flat-panel displays are increasingly popular in homes. Advances in technology and reductions in prices have made them increasingly prevalent in homes throughout the United States and abroad.

Unlike their bulky and heavier predecessors, most flat-panel displays are wall-mounted. In homes that have a chimney, a common approach is to mount the flat-panel display over the chimney mantel. This arrangement is generally more aesthetically pleasing since less pieces of furniture compete with the living room space. The chimney is also a natural focal point in a living room and furniture is typically arranged to reflect that fact.

Mounting a display over a chimney often results in the display being in a position that is awkward for viewing and uncomfortable for persons viewing it from a seated position. Viewers can experience neck and shoulder strain from having to tilt their heads for an extended period of time.

Mounting a display over a chimney leads to an increased viewing distance. This reduces the viewer's ability to appreciate the image detail.

Mounting a display over a chimney leads to viewing angles that distort the display image. This distorts the image aspect ratio and reduces the viewer's ability to appreciate the image.

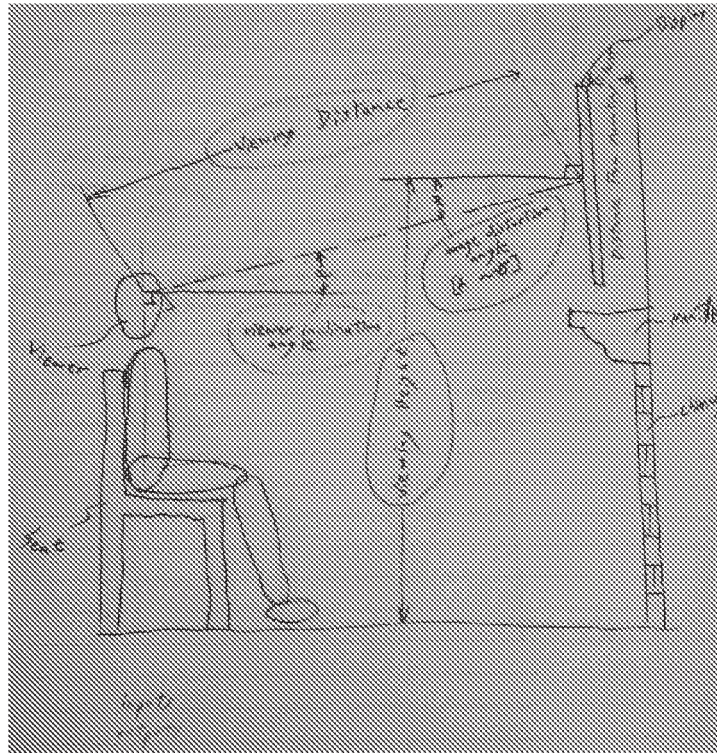
3-D televisions are now available on the market and 3-D models that don't require glasses are anticipated for production in the near future. 3-D images are more sensitive to viewing angles and viewing distance.

Better for Video games

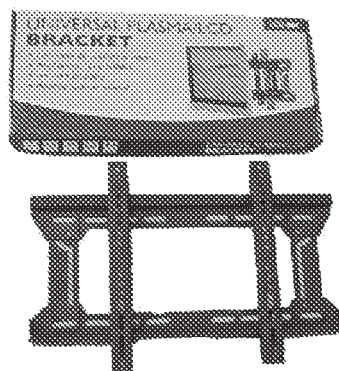
Better for a group of viewers

Previously

Several types of flat-panel display mounts are available. These are commonly used to mount a flat-panel display over a chimney. Some allow for adjustments to the distance from the mounting point, viewing height, and the image distortion angle. The distance from the mounting point and viewing height affect the viewer inclination angle and the viewing distance.

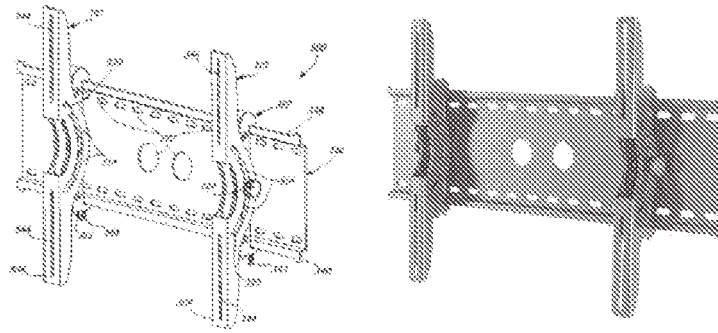


include key and explanation of each term



<http://cnglobaltone.en.made-in-china.com/product/koGQENLcYihV/China-LCD-Mount-Flat-Panel-TV-Wall-Mount-LCD-867-.html>

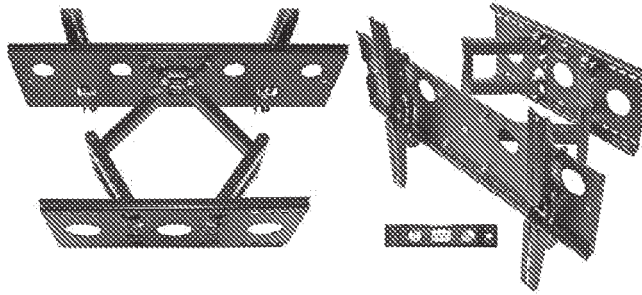
One type of mount affixes a flat-panel display to the wall. Once installed, adjustments cannot be made to the viewing height, the distance from the mounting point, or the image distortion angle. Therefore, the viewing distance and the viewer inclination angle cannot be adjusted.



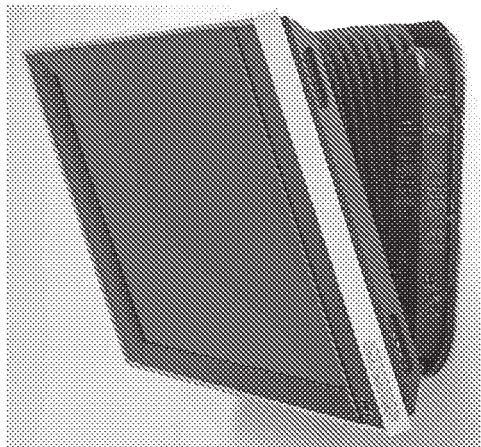
Patent No.: US 7,178,775 B2
 Date of Patent: Feb. 20, 2007

<http://tvinstallation.biz/wp-content/uploads/2009/09/flat-mount.jpg>

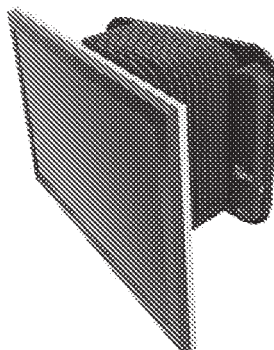
One type of mount affixes a flat-panel display to the wall and provides the ability to reduce the image distortion angle by allowing for some rotation along a horizontal axis. Once installed, adjustments cannot be made the distance from the mounting point, or the viewing height. Therefore, the viewing distance and the viewer inclination angle cannot be adjusted.



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http://www.electronichouse.com/article/k2_lowers_x_arm_mount_price_500/C70

One type of mount affixes a flat-panel display to the wall and provides the ability to adjust the distance from the mounting point. This type of device also often provides the ability to adjust the image distortion angle along one or more axes. These enable the viewer to make slight adjustments to the viewing

Lumi Ex. 1007

distance. This type of display does not allow for adjustments to the viewing height. Therefore, the viewer inclination angle cannot be adjusted.

Summary

These types of display mounts do not change the viewing height. The viewer inclination angle from a seated position remains relatively unchanged. Display mounts that provide the ability to adjust the image distortion angle enable the viewer to see the display image more perpendicularly.

When these display mounts are mounted over a chimney, the viewing height is awkward. It creates conditions for an uncomfortable viewer inclination angle when viewing the display from a seated position. Viewers can experience neck, shoulder, and back strain from having to tilt their heads up for an extended period of time.

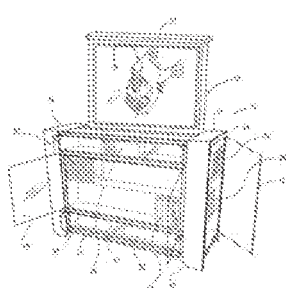
A display mounted over a chimney cannot be lowered. This creates an increased viewing distance. This reduces the viewer's ability to appreciate the image detail.

Display mounts that do not allow for adjustment to the image distortion angle distort the image aspect ratio and reduce the viewer's ability to appreciate the image.

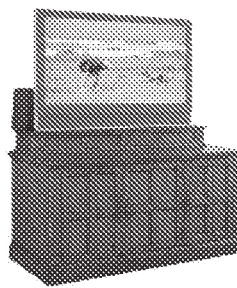
3-D televisions are now available on the market and 3-D models that don't require glasses are anticipated for production in the near future. 3-D image quality degrades with high image distortion angles and viewing distance.

Displays are often used for interactive activities such as video game playing. For these activities it is beneficial to view the display at an appropriate image distortion angle and viewing distance.

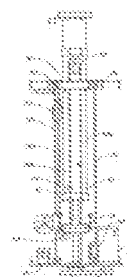
Previously



Pub. No.: US 2006/0261714 A1
Pub. Date: Nov. 23, 2006



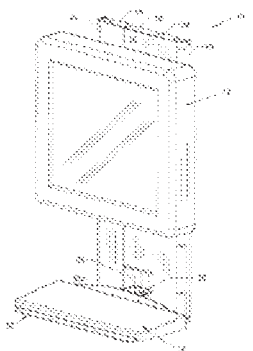
Pub. No.: US 2007/0158627 A1
Pub. Date: Jul. 12, 2007



http://www.amazon.com/gp/product/images/B003XA4XDE/ref=dp_image_0?ie=UTF8&n=172282&s=electronics

Another type of mount can adjust the viewing height along a linear path. This type enables for the raising and lowering of a display from a concealed structural location or from a piece of furniture. This type of mount generally requires a custom installation to incorporate it into a structure or a piece of furniture.

This type of device does not have the ability to adjust the image distortion angle. Neither the viewing distance nor the viewer inclination angle can be adjusted.



Patent No.: US 6,189,849 B1
Date of Patent: Feb. 20, 2001

Another type of mount can adjust the viewing height of a display along a wall or mounting point. The viewing distance can be adjusted. This type of device does not have the ability to adjust the distance from the mounting point or the image distortion angle.

However, this type of device does not lend itself to be mounted over a chimney. The displays cannot be lowered below the mantel. The benefit of adjusting the viewing height is lost by the fact that the minimum height is still above the chimney mantle. These types of devices generally do not have the ability to adjust the image distortion angle.

Device Type	Adjustable Distance from Mounting Point	Adjustable Viewing Height	Adjustable Image Distortion Angle	Adjustable Viewing Distance	Adjustable Viewer Inclination Angle	Superior Performance Over the Chimney Mantle
Fixed Mount	No	No	No	No	No	No
Fixed Mount with Rotation about a horizontal axis	No	No	Yes	No	No	No
Telescopic mount with rotation about one or more axes	Yes	No	Yes	Yes	Yes	No
Height adjustable	No	Yes	No	Yes	No	No

One Embodiment	Yes	Yes	Yes	Yes	Yes	Yes
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Summary

In accordance with one embodiment an adjustable display mount comprises a wall-mounting plate, a display mounting plate, a parallelogrammic structure, and an adjustment mechanism.

This invention contains an optional bracket for mounting one or more speakers such that the speakers will remain in the same position, with respect to the display, as the display position is adjusted.

This invention contains an optional bracket for mounting a display heat shield such that the heat shield will remain in the same position, with respect to the display, as the display position is adjusted.

This invention contains an optional decorative/camouflaging cover that can be attached to conceal electrical and/or mechanical components and provide a more aesthetically pleasing display mount.

Drawings – Figures

Fig 1 shows the front view of the adjustable display mount

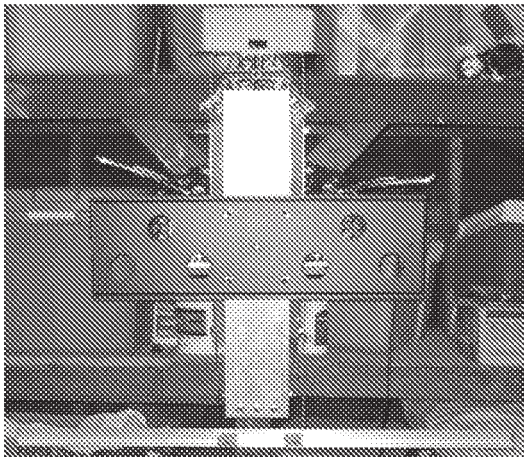


Fig 2 shows the side view of the adjustable display mount



Fig 3 shows an isometric view of the display mount

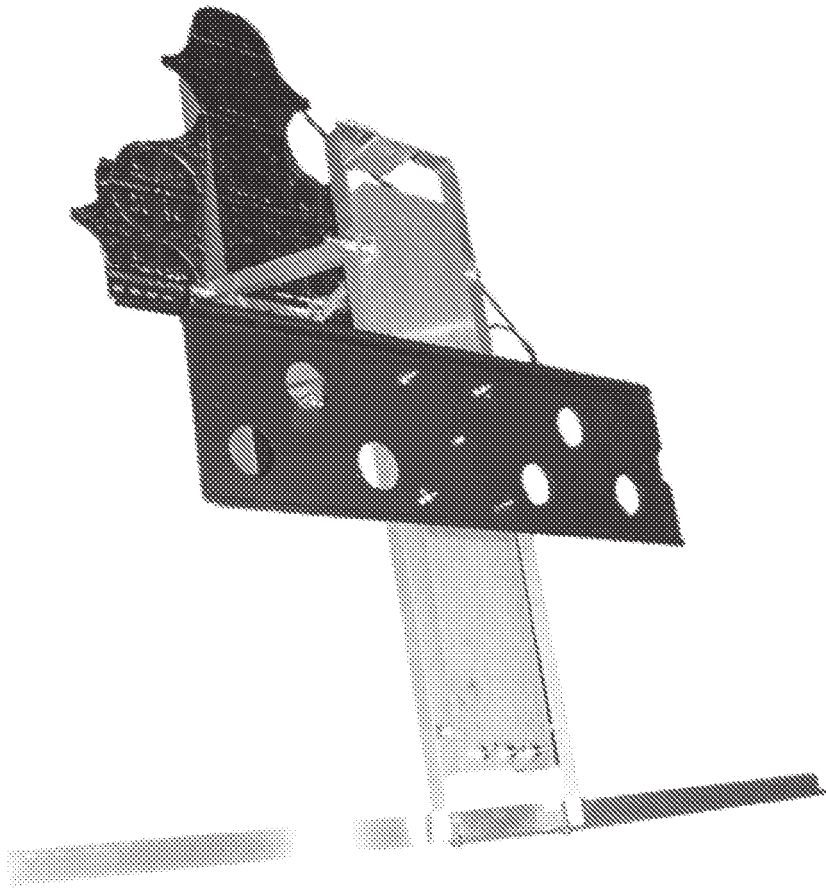


Fig 4a to 4e show the side view of the adjustable display mount at various positions

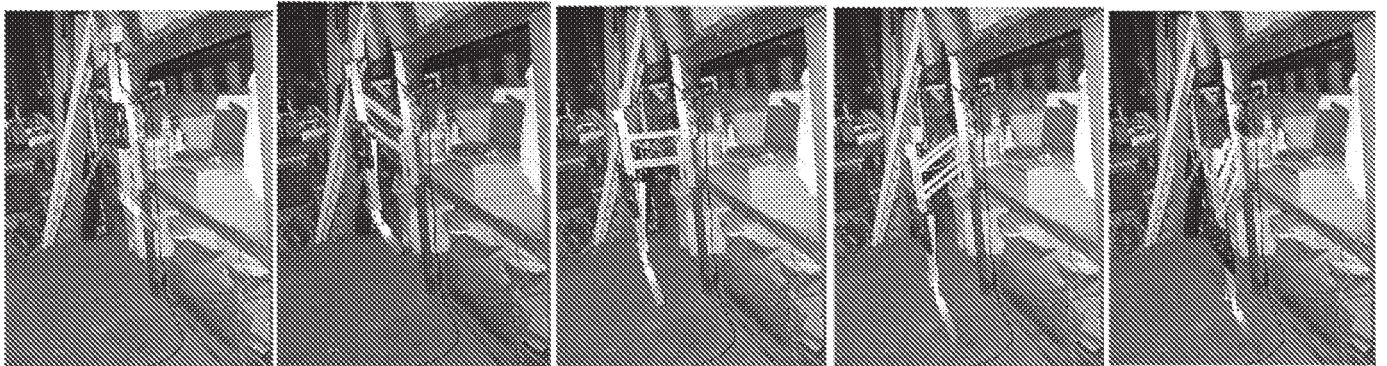


Fig 5 shows the electrical circuit wiring diagram for one electrical embodiment

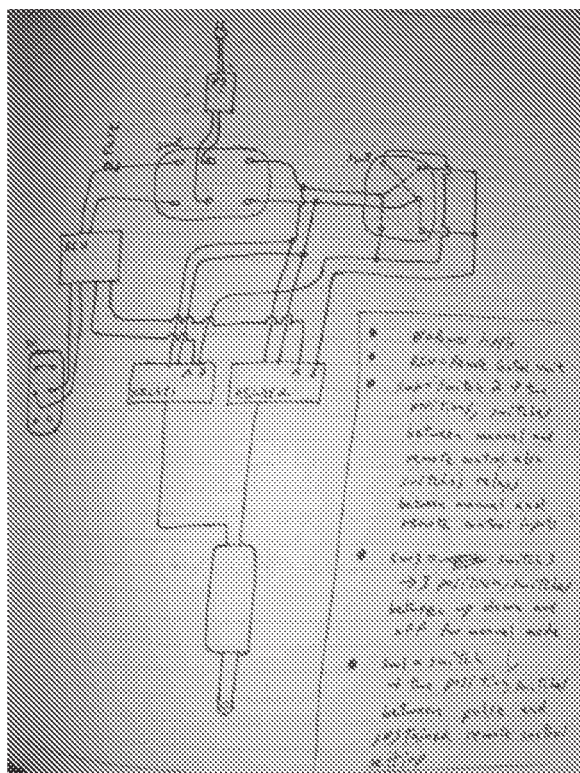
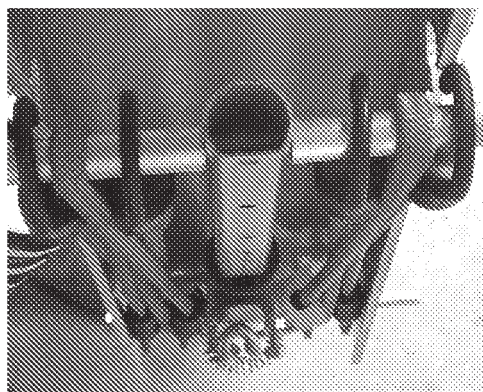
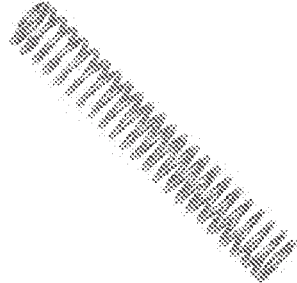


Fig 6a to 6d shows various counterbalance devices that can be used for the adjustment mechanism

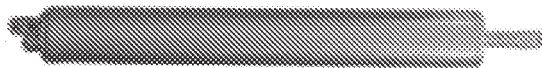
Bungee (used in conjunction with locking device)



Spring (used in conjunction with locking device)



Non-locking gas spring (used in conjunction with locking device)

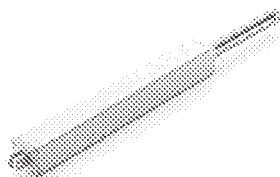


Locking gas spring

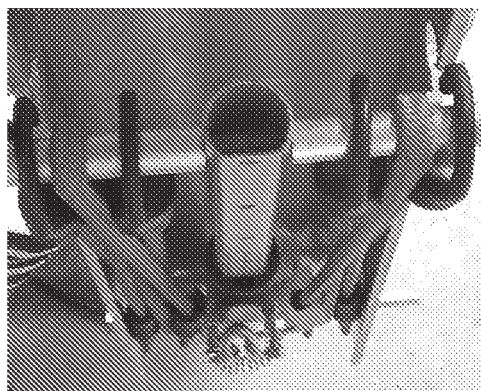


Fig 7a to 7c show various devices that can be used in the adjustment mechanism

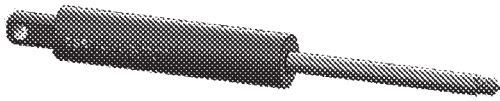
Tubular Actuator



Pin-locking piston



Locking gas spring



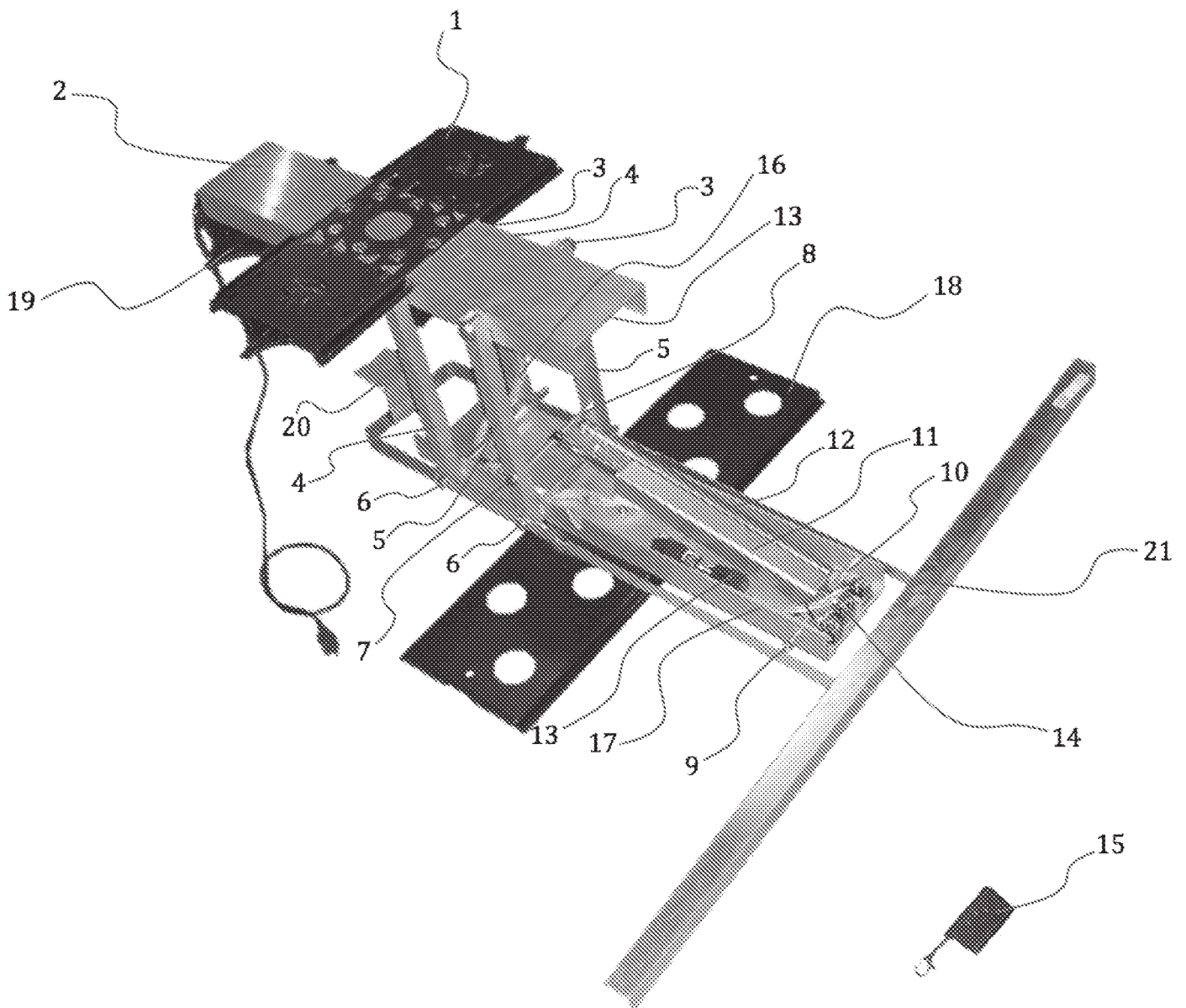
Videos 1 front view

Video 2 side view

Drawings – Reference Numerals (optional)

10

Detailed Description – First Embodiment – Figs.



1 Mounting Plate

Affixes armature to mounting surface

2 Rear Casing

Provides support for one end of parallelogrammic structure (4 & 5)

Contains pivot point holes for one end of parallelogrammic structure (4 & 5)

Provides housing for electronics (13)

Provides housing and routing for electronic control cables (16)

Provides housing for and routing for audio/video cables (Display, Speakers –not shown)

Provides support for accessory to decorate and/or camouflage part or whole of exposed structure (19)

3 Bolts (+ washers???)

Bolts used to fasten parallelogrammic structure which serve as axis of rotation for parallelogrammic components

4

Arm of parallelogrammic structure

5

Arm of parallelogrammic structure

Support for one end of adjustment mechanism (11, 12, 13, 14, 15, & 16)

Contains holes that serve as pivot points for one end of adjustment mechanism (11, 12, 13, 14, 15, & 16)

6

Bolts used to fasten parallelogrammic structure which serve as axis of rotation for parallelogrammic structure (4 & 5)

Mounting Point for speaker accessory (20)

Mounting point for heat shield accessory (21)

Attachment point for electronic control cables (16)

Attachment point for audio/video cables (display, speakers – not shown)

7

Bolts used to fasten adjustment mechanism which serve as axis of rotation for adjustment mechanism

Attachment point for electronic control cables (16)

Attachment point for audio/video cables (display, speakers – not shown)

8

Spacers to maintain proper location of tubular actuator and counterbalance mechanism (11 & 12)

9

Bolts used to fasten adjustment mechanism which serve as axis of rotation for adjustment mechanism

Attachment point for electronic control cables (16)

Attachment point for audio/video cables (display, speakers – not shown)

10

Spacers to maintain proper location of tubular actuator and counterbalance mechanism (11 & 12)

11

Tubular actuator (adjustable and lockable)

12

Counterbalance mechanism

13

Controls:

Power Supply,

Relays,

Wires,

14

Switches

15

Remote Control controller

16

Wire harness

17

Housing for adjustment mechanism (11, 12, 13, 14, & 16)

Housing for electronics (11, 13, 14, & 16)

Mounting point for electronic control switches (14)

Mounting point for other end of parallelogrammic structure (4 & 5)

Mounting point for front display mounting plate (18)

18

Front display mounting plate

19

Camouflaging/Decorative cover for Rear casing (2) and Mounting Plate (1) Accessory

20

Speaker(s) mount accessory

21

Display heat shield accessory

Operation – First Embodiment – Figs.

Description – Alternative Embodiment – Figs.

Operation – Alternative Embodiment – Figs.

Conclusion, Ramifications, and Scope

Accordingly the reader will see that, according to one embodiment of the invention, I have provided...

While the above description contains many specificities, these should not be construed as limitations on the scope of any embodiment, but as exemplifications of various embodiments thereof. Many other ramifications and variations are possible within the teachings of the various embodiments. For example,

Thus the scope should be determined by the appended claims and their legal equivalents, and not by the examples given.

Claims:

1.

Abstract

What is the working title of the invention:

Adjustable Flat-Panel Display Mount System

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714 420 5826

IT SHOULD BE NOTED THAT ALTHOUGH THE MECHANISM DEPICTED ABOVE IS AUTOMATED, THE PRESENT INVENTION IS NOT INTENDED TO BE LIMITED THERETO AS IT CAN ALSO BE MANUALLY MOVED.
