FLAT TV LIFT IN UNIT FOR FURNITURE

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Abstract

Furniture for receiving, storing, and displaying a flat-panel TV includes a floor mounted cabinet having a top surface. A vertically moving flat-panel TV mount is utilized for moving a flat-panel TV vertically between a position enclosed within the cabinet and an elevated position overlying the top surface of the cabinet for viewing. The mechanism for effecting lifting utilizing a single vertical linear actuator is disclosed.
FLAT TV LIFT IN UNIT FOR FURNITURE

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims the priority of provisional patent application No. 60/641,723 filed Jan. 5, 2005.

BACKGROUND OF THE INVENTION

[0002] This invention relates to a cabinet for accommodating a so-called flat panel TV. More particularly, a cabinet and lift mechanism for use in combination with the flat panel TV is disclosed for selectively elevating the flat-panel TV from storage in the cabinet for viewing from above and in front of the cabinet.

[0003] Flat-panel TVs, such as those having plasma displays and/or liquid crystal displays, are now common. Over so-called “CRT” (cathode ray tube) TVs, flat-panel displays have a depth on the order of 4 inches, reduced from at least 12 inches. Such flat-panel TVs in a common viewing size, such as 42 inches (measured on the diagonal) has a screen having an overall dimension of 4 inches thick, 38 inches of length, and 24 inches of height weighing on the order of 120 pounds. The problem that is addressed is concealing the flat panel TV in a concealed cabinet of small footprint and elevating the flat-panel TV only for viewing.

[0004] As initially sold, flat-panel TVs come with attached feet. The idea is that the feet are set up on any table or counter with the panel protruding upwardly for viewing. While this enables immediate viewing, such mounting is generally unacceptable. The flat-panel TV when not in use is an unsightly addition to the decor of the average home.

[0005] Wall mounted flat-panel TVs are known. Unfortunately, these TVs occupy a large section of wall space on a permanent basis where they are generally considered unattractive, are extraordinarily heavy (in the range of 120 pounds), and frequently have unsightly cables dangling from their wall mount to supporting components below. As the flat panel TVs are about 4 inches thick and have a weight in the range of 100 pounds, conventional wall hanging of such flat panel TVs is generally not feasible. For the modest home, there is needed a cabinet having minimum depth and consequent minimum footprint capable of concealing such a flat-panel TV when it is not in use. At the same time, the flat-panel TV must be elevated to a comfortable viewing disposition when in use.

[0006] Flat-panel TVs of necessity must be connected to support appliances commonly called “components” including cable boxes, DVD players, or recording devices (such as the TiVo™ recorder, a trademark of the TiVo Company of Alviso, Calif.). Such components are on the order of approximately 12 inches wide, 2 to 5 inches high, and most importantly require approximately 18 inches in depth; this distance including both the depth of the components chassis itself and the required distance for cable attachments to plug into the back of the components without undue dimensional constraint.

[0007] It is known to lower and elevate flat-panel TVs into pockets. In the lowered position, the flat-panel TVs are concealed when not in use. In the raised position, the flat-panel TVs are arrayed for viewing. Unfortunately, lifting mechanisms so far proposed are extraordinarily expensive, arranged to frame the flat-panel TV, and in the usual case custom designed into specialized custom cabinetry.

[0008] An exemplary apparatus for receiving a flat-panel TV into custom cabinetry is made by the Inca Corporation of Gardena, Calif., and sold under the description and/or trademark Plaza LineTV Lift or Plasma Ultratable TV Lift. These respective units are made for mounting at the respective sides close to the custom cabinetry and to the flat-panel TV. The lift mechanism contains the flat-panel TV between the respective sides of the elevating apparatus for being raised and lowered for viewing. Since flat-panel TVs vary at their respective edges or bezels in both thickness and surrounding dimension, mounting of such flat-panel TVs to the raising and lowering mechanisms is difficult. Complex mechanisms such as rack and pinions on either side of the lifts form sturdy but extraordinarily expensive mechanisms for raising and lowering the bezel framed flat-panel TVs. Simply stated, simplicity has not been present in none of these prior art devices.

[0009] Further, attention is directed to US Patent Publication US 2004/0164659 of Bober et al. illustrating a sub cabinet for insertion to a regular cabinet having a vertical lift for elevating and retracting a flat panel TV into and out of a position of storage in the sub cabinet. The simplified lift mechanism structure set forth herein is not disclosed.

[0010] A solution in assembling such custom cabinetry with these prior art lifts has been to place the components either in front of or to the side of the flat-panel TV. Where the components are in front of the flat-panel TV, adding a 6 inch depth required for the thickness of the flat-panel TV to the 18 inch depth required for the components produces an unduly large depth footprint for the cabinet. Alternatively, such components can be placed on either side of the flat-panel TV. In this case, they expand the overall width of the entertainment unit to a width that is otherwise untenable. Adding at least an additional foot to a cabinet containing an object 38 inches long (for a total of at least 50 inches) is undesirable.

[0011] The homeowner of modest circumstance purchasing a flat-panel display is not given a convenient alternative in storing, mounting and displaying a flat-panel TV for home use.

BRIEF SUMMARY OF THE INVENTION

[0012] Furniture for receiving, storing, and displaying a flat-panel TV includes a floor mounted cabinet having a top surface. A vertically moving flat-panel TV mount is utilized for moving a flat-panel TV vertically between a position enclosed within the cabinet and an elevated position over-lying the top surface of the cabinet for viewing. Spaced apart parallel slides (typically of the over travel design) have attachment to the cabinet and to a vertically moving flat-panel TV mount for sliding the mount from within the cabinet to elevate the mount to overlie the top surface of the cabinet. A lift is attached to the cabinet at one end and to the vertically moving flat-panel TV mount at the other end for raising and lowering the flat-panel TV mount into and out of the cabinet for storage and viewing respectively. The cabinet configuration is disclosed where components are stowed below the stored flat-panel TV to enable a shallow footprint cabinet having optimum connection from the components to the flat-panel TV. Mounting hardware for holding and...
elevating a flat-panel TV includes a mount for attachment to the back panel flat vertical surface of the cabinet. A flat-panel TV mount for attachment to a flat-panel TV is utilized and has paired spaced apart vertical slides extending between the respective sides of the mount for attachment to a flat vertical surface and respective sides of the flat-panel TV mount. The slides permit a flat-panel TV mount to be raised and lowered relative to the mount for attachment to a flat vertical surface. A central lift mechanism between the slides and the mount for attachment to the vertical surface of the flat-panel TV mount enables raising and lowering of the flat panel TV mount. Mounting of the flat-panel TV to the mount quickly installs the unit for attractive storage and optimum elevated viewing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is a perspective view of the cabinet of this invention with the flat-panel TV concealed interior of the cabinet;

[0014] FIG. 2 is a perspective view of the cabinet of this invention with the flat-panel TV elevated for viewing showing components stowed underlying flat-panel TV storage volumes;

[0015] FIG. 3 is a perspective view of the cabinet similar to FIG. 2 illustrating the flat-panel TV at the lift mechanism attached to the back of the cabinet with a section of the top of the cabinet attached to the top of the elevated flat panel TV;

[0016] FIG. 4 is a stripped away view of the cabinet before a flat panel TV is mounted illustrating brackets for receiving the flat panel TV; and,

[0017] FIG. 5 is an illustration of the lift mechanism of this invention from the reverse side shown separate and apart from the cabinet so that lift operation can be fully understood.

DETAILED DESCRIPTION OF THE INVENTION

[0018] Referring to FIG. 1, cabinet 10 having top 11, front 12, and respective sides 14, 15 is illustrated in perspective. Total cabinet depth is on the order of 18 inches. Total cabinet height is on the order of 36 inches. Overall length is on the order of 50 inches. It is to be noted that the flat-panel TV cabinet has a dimension not unlike a typical credenza.

[0019] Referring to FIG. 2, flat-panel TV 20 is shown elevated with portion 21 of top 11 overlying the upper edge of the flat-panel TV 20. Components storage compartment 30 is illustrated with typical components including a DVD player 31 and a cable box 32. It is to be noted that storage compartment 30 is completely under the lifting mechanism for the flat-panel TV 20 as well as the flat-panel TV 20 when it is in the stored position. Further, components storage compartment 30 has a depth on the order of 18 inches. This depth is necessary to permit the components (normally having a depth on the order of 14 inches) but to additionally accommodate their plug-in features, such as cable connections, sound connections, electrical connections, and the like. The reader will thus understand that it is the depth of the components storage compartment 30 that controls the overall depth of the cabinet 10 which constitutes the flat-panel TV storage cabinet 10.

[0020] Respective doors 16, 17 are shown open with appropriate disk storage at 33, 34. Side door 18 is shown in the open position here illustrating storage of respective discs 35, 36. The reader will as well understand that side speakers can be mounted at this location, either within the cabinet or to the respective doors for acoustical exposure when the doors are open. A central speaker 39 is illustrated for connection to a typical "surround sound" system.

[0021] Referring to FIG. 3, flat-panel TV 20 is shown in the elevated position with top section 21 elevated in overlying top 11 of the cabinet. Top section 21 typically recesses into top II of cabinet 10. All components of the cabinet have been removed to expose the back cabinet side 43. Respective over travel drawer guides 41, 42 mount to the inside surface of back panel 43 with lift mechanism 40 mounted at step 45 overlying components storage compartment 30. Lift 40 is here shown having elevated the flat-panel TV 20 for viewing, while over travel drawer guides 42, 43 assure non-canted upward lift of the mounted flat-panel TV 20.

[0022] Referring to FIG. 4, the cabinet is illustrated with the lift mechanism retracted before a flat-panel TV 20 is attached. Lift mechanism 40 is shown retracted with respective over travel slides 42, 43 confined to the interior of the cabinet. The mounting panel 50 includes brackets 51, 52 with keyhole mounting apertures 53, 54 for receiving and mounting the flat-panel TV 20 (not shown) and respective rear protruding knobs conventional with such flat-panel TVs 20.

[0023] Referring to FIG. 5, the lift mechanism utilized is illustrated from the reverse side. Lift 40 is manufactured by LINAK of Guderup, Denmark and can be obtained from LINAK, U.S. Inc. at North and South American Headquarters, 2200 Stanley Gault Parkway, Louisville, Ky. 40223 under the designation Desklift DL4. This linear actuator is intended for tandem operation with one or more identical actuators from a controller, sold by the manufacturer. In the present configuration, only one of these actuators is required when used with over travel drawer guides 42, 43. As can be seen, each of the over travel drawer guides 42, 43 includes three discrete segments, 42a, 42b, 42c and 43a, 43b and 43c. The respective over travel drawer guides are fastened at their respective segments 42c and 43c to angles 52, 53 which in turn conveniently fasten to the flat inner surface of the cabinet back 43 (See FIG. 3).

[0024] Angle bracket 41 fastens to the bottom of lift 40. A similar bracket 41 fastens to panel 50. Thus as panel 50 is raised and lowered, it is steadied by the respective over travel drawer guides 42, 43. Once a flat-panel TV is fastened, raising and lowering of the panel 50 with the weight of the flat-panel TV easily occurs.

[0025] I have shown a lifting mechanism which includes a linear actuator. Other lifting mechanisms will work as well. For example, cable revving systems well work as well. For example, by stringing cables over pulleys and allowing lifting responsive to cable gathering, raising and lowering of the flat-panel TV can occur as well.

What is claimed is:

1. Furniture for receiving and displaying a flat-panel TV comprising:
   a. a floor mounted cabinet having a top surface;
   b. a vertically moving flat-panel TV mount for moving vertically between a position enclosed within the cabinet and an elevated position overlying the top surface of the cabinet;
spaced apart parallel slides having attachment to the cabinet and to the vertically moving flat-panel TV mount for sliding the mount from within the cabinet to elevate and overlie the top surface of the cabinet; and,

a lift attached to the cabinet one end and to the vertically moving flat-panel TV mount at other end for raising and lowering the flat-panel TV mount into and out of the cabinet

whereby a flat-panel TV can be mounted to the vertically moving flat-panel TV mount for installation to the floor mounted cabinet.

2. Furniture for receiving and displaying a flat-panel TV according to claim 1 further comprising:

the floor mounted cabinet includes a backside; and,

the spaced apart parallel sides and lift are mounted to the cabinet backside.

3. Furniture for receiving and displaying a flat-panel TV according to claim 1 further comprising:

the vertically moving flat-panel TV mount comprises a relatively moving drawer moving vertically through the top surface of the cabinet.

4. Furniture for receiving and displaying a flat-panel TV according to claim 3 further comprising:

the vertically moving flat panel TV mount includes a section of the top surface of the cabinet overlying the vertically moving flat-panel TV mount.

5. Furniture for receiving and displaying a flat-panel TV according to claim 1 further comprising:

the cabinet the findings underlying the vertically moving drawer a spatial interval for receiving components connected to the flat-panel TV.

6. Mounting hardware for holding and elevating a flat-panel TV comprising:

a mount for attachment to a flat vertical surface;

a flat-panel TV mount for attachment to a flat-panel TV;

paired spaced apart vertical slides extending between the respective sides of the mount for attachment to a flat vertical surface and respective sides of the flat-panel TV mount for permitting a flat-panel TV mount to be raised and lowered relative to the mount for attachment to a flat vertical surface; and,

a lift mechanism of having attachment between the mount for attachment to the vertical surface and the flat-panel TV mount enable raising and lowering of the flat panel TV mount relative to the mount for attachment to a vertical surface;

whereby a flat-panel TV can be attached to the flat-panel TV mount and raised and lowered relative to the mount for attachment to a flat vertical surface.