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FLAT MONITOR SUPPORT TRAY FOR A PLATFORM APERTURE

This application is a continuation-in-part of co-pending U.S. Serial No. 09/724,282, filed on November 28, 2000.

5 Field of the Invention

This invention relates to flat monitor supports, and, more particularly, to flat monitor supports that incorporate a flat monitor support tray that associates with a viewing aperture in the working platform of a
10 work station or the like.

Background of the Invention

The positioning of a flat monitor relative to the working platform of a work station presents problems. If the flat monitor is set upon the working platform
15 surface, either in a generally vertical or somewhat inclined orientation, the flat monitor must be associated with a supporting base structure. The base structure may be objectionable because it is cumbersome, or easily moved or tipped, or consumes a relatively
20 large or significant area of the limited working platform surface.

If the flat monitor is located below a viewing aperture in the working platform, then a special support structure for the flat monitor is needed. Although some
25 monitor support structures are known that could be employed for such purposes, these structures can be awkward and time consuming to install, and may consume an objectionably large volume of an already small knee hole space provided beneath the viewing aperture.

30 Particularly from an ergonomic viewpoint, when the flat monitor is located at, in or adjacent to a viewing aperture in a working platform, it would be desirable to have the flat monitor positioned, preferably adjustably, at an inclined angle suitable for good screen

viewability by a viewer who is seated alongside the working platform.

The fact that work stations and their working platforms can have many different forms and constructions compounds the problem of achieving a simple, effective, and reliable flat monitor support for use in the vicinity of a viewing aperture in a working platform.

So far as now known, a simple and effective flat monitor support that is particularly well adapted for locating and positioning a flat monitor in and about the immediate vicinity of a work station viewing aperture has not previously been available. The present invention provides such a support.

Summary of the Invention

This invention is directed to a flat monitor support that incorporates a flat monitor support tray-like structure and that is adapted for usage in and about a viewing aperture defined in the working platform of a work station or the like.

The inventive flat monitor support includes an aperture frame that associates with the perimeter region of the aperture. Optionally, the aperture frame can support edge portions of a cover plate, including, for example, a transparent viewing window.

The aperture frame also cooperatively associates with a tray-like structure that is enabled to support a flat monitor. Optionally, when a window or cover plate is being utilized, the tray like structure may be removably associated with the aperture frame and may be located below the window or cover plate. When a flat monitor rests upon the tray-like structure, and the aperture frame is in a generally horizontal orientation, the aperture frame and the tray-like structure co-act to

function as a flat monitor support.

The inventive flat monitor support is relatively easy to fabricate, install and use.

5 The inventive flat monitor support avoids the problems and disadvantages of prior art flat monitor supports, particularly those that are experienced in the vicinity of an aperture defined in a working surface.

The inventive flat monitor support is safe, convenient, easy to use, and versatile.

10 Owing to the versatility of contemporary construction techniques, the inventive flat monitor support can be variously constructed and/or comprised of various materials. A present preference is to fabricate the flat monitor support of molded plastic, but
15 alternative materials, such as sheet metal, wood, fiberboard or the like, may be used, as those skilled in the art will readily appreciate. The inventive flat monitor support can be fabricated and used in association with various apertured working platforms,
20 their associated work stations, and the like.

The inventive flat monitor support can exist in many different embodiments. An embodiment of the flat monitor support can, for example, be of unitary, one-piece molded construction, or can be comprised of
25 multiple cooperating components. The aperture frame and the flat monitor support tray-like structure can each have many different forms, configurations, and cooperative components. An aperture frame and a flat monitor support tray-like structure may each be
30 separately formed or assembled, but adapted for cooperative inter-engagement and functioning particularly at a working platform aperture.

An inventive flat monitor support can utilize a variety of auxiliary or optional components that are

aimed at enhancing the usability and utility of a particular embodiment. For example, an embodiment may be used in cooperation with means for flat monitor inclination angle adjustment, for flat monitor position
5 adjustment, and/or for flat monitor height adjustment, relative to the tray-like structure.

For another example, an embodiment may be provided with an associatable, cooperating, removable cover plate for covering an aperture that is associated with an
10 inventive flat monitor support. When, for illustration, a flat monitor is not installed on the flat monitor supporting tray-like structure, the cover plate may be installed on or in the aperture frame, thereby enabling full usage of the working platform top surface
15 independently of the existence of a viewing aperture therein, if desired. In such a storage configuration, the flat monitor support does not detract from the presence of an aperture in the working platform.

Various auxiliary and optional flat monitor
20 positioning means can be associated with the flat monitor tray-like structure, such as wedge structures, retaining fence structures, and the like, and can be used to affect flat monitor inclination or position relative to a tray-like structure.

25 In another presently preferred class of the inventive flat monitor supports, the flat monitor support tray-like structure, or components thereof, is/are adjustable or moveable relative to the aperture frame.

30 In another presently preferred class of the inventive flat monitor supports, the flat monitor support tray-like structure can be removed from the aperture frame, inverted, perhaps changed in orientation, and re-associated with the aperture frame.

In the inverted position, for example, a flat monitor can be supported by the tray-like structure in an inclined orientation that is partially or completely above the working platform top surface, if desired. In the inverted position, for another example, a portion of the tray-like structure may serve to cover the aperture and increase the useful area of the working surface of a working platform.

Various other features, aspects, embodiments, objects, aims, purposes, applications, and the like for the present invention will be apparent to those skilled in the art from the present description taken with the accompanying drawings and the appended claims.

Brief Description of the Drawings

In the drawings:

Fig. 1 is a perspective environmental view illustrating a work station having an apertured working platform whose aperture is equipped with an embodiment of the inventive flat monitor support;

Fig. 2 is an exploded perspective view of the flat monitor support of Fig. 1;

Fig. 3 is a vertical, transverse sectional view taken through a rearward region of the flat monitor support of Fig. 1, some parts being broken away and some parts being shown in section;

Fig. 4 is a fragmentary perspective view similar to Fig. 1, but showing the working platform aperture after the outer flat monitor support tray of the flat monitor support has been separated from the aperture frame of the flat monitor support, inverted, re-oriented, and re-associated with the aperture frame, thereby to provide a flat monitor support platform adapted to support a flat monitor in an elevated, inclined relationship relative to the top surface of the working platform;

Fig. 5 is a perspective view of the outer flat monitor support or shell of the flat monitor support tray of the flat monitor has been separated from the aperture frame and inverted and reassociated with the aperture frame to produce the configuration shown in Fig. 4;

Fig. 5A is a fragmentary view similar to Fig. 3 but showing an alternative embodiment of the inventive flat monitor support;

Fig. 6 is a view similar to Fig. 1 but showing an alternative embodiment of the inventive flat monitor support in combination with the aperture of the working platform of the illustrative work station;

Fig. 6A is a fragmentary enlarged vertical sectional view taken approximately along the line VIA-VIA of Fig. 6;

Fig. 6B is a fragmentary enlarged vertical sectional view taken approximately along the line VIB-VIB of Fig. 6;

Fig. 7 is an exploded perspective view of the flat monitor support of Fig. 6;

Fig. 8 is a perspective view similar to Fig. 1 but showing the aperture of the working platform of the illustrative work station equipped with an alternative embodiment of the inventive flat monitor support;

Fig. 9 is an exploded perspective view of the flat monitor support of Fig. 8;

Fig. 10 is a fragmentary enlarged vertical sectional view taken along the line X-X of Fig. 8;

Fig. 11 is a fragmentary perspective view showing the aperture of the working platform of the illustrative work station equipped with an alternative embodiment of the inventive flat monitor support;

Fig. 12 is a fragmentary vertical sectional view

through a side wall portion and engaged aperture frame portion of the embodiment shown in Fig. 11; and

Fig. 13 is a perspective view of a flat monitor positioning plate that may be utilized in the embodiment shown Fig. 11.

Detailed Description

Referring to Figs. 1-5, there is seen an embodiment 20 of a flat monitor support apparatus of the present invention. The apparatus is here functionally associated with an aperture 21 in the working platform 22 of a work station 23.

The platform 22 is supported in a generally horizontal orientation by panels 24, 25 and 26, or otherwise as may be desired. Between panels 24 and 25, a kneehole 27 is provided, and between panels 25 and 26, a shelf 28 is provided which may be used for holding a computer or computer components, if desired. The viewing aperture 21 in the platform 22 is located over the kneehole 27. Various work station structures can be used, as will be readily apparent to those skilled in the art. An illustrative flat monitor 29 (shown in phantom) is supported in the aperture 21 by the apparatus 20.

The apparatus 20, as shown for example in Fig 2, includes an aperture frame 30, an outer tray 31, an inner tray 32, and an optional flat monitor support fence 33. The term "tray" as used herein is generally synonymous with the word "tray-like" and these words refer generally to a flat bottomed, open upper surfaced receptacle with relatively low rim portions for holding or displaying a flat monitor. In the apparatus 20, the inner tray 32 is received within the outer tray 31, and the outer tray 31 is received within the aperture frame 30 with border portions of the outer tray 31 engaging

and being supported by adjacent inside (relative to aperture 21) portions of the aperture frame 30. A transparent viewing window (not shown) for the aperture 21 may be provided, if desired, and the aperture frame 30 may be configured to support the window.

The apparatus 20 is conveniently comprised of molded plastic component members. Alternatively, the frame 30 can be comprised of a metal (extruded or molded components, for example). The trays 31 and 31, alternatively, can be comprised of fabricated sheet metal, if desired. The size interrelationship between the aperture frame 30 and the aperture 21 is chosen so that the aperture frame 30 extends about the perimeter of the aperture 21.

Optionally, but conveniently and preferably, the upper perimeter edge portions of the aperture frame 30 are provided with an out-turned shoulder flange 71 that is conveniently and preferably unitarily formed with, and extends generally perpendicularly outwardly relative to, the aperture frame 30. The flange 71 is configured to extend over, and associate in a flush overlapping relationship with, the aperture 21 perimeter-adjacent portions of the top or working surface of the working platform 22 that are next to the aperture 21.

Preferably, and as shown, the shoulder flange 71 here continuously extends around the upper perimeter edge portions of the aperture 21 and is adapted to rest upon adjacent upper surface edge portions of the working platform 22 which are next to the aperture 21.

Also, and as shown, for example, in Fig. 3, upper inside (relative to the aperture 21) surface portions 72 of the aperture frame 30 that preferably continuously extend around the aperture frame 30 are preferably configured to receive slidably thereover in adjacent

relationship flanged edge or border portions of the
outer tray 31, as further described below. The aperture
frame 30 is further preferably configured with an in-
turned ledge 73 that is located just below the upper
5 inside surface portions 72 and that preferably
continuously extends around the aperture frame 30. The
ledge 73 is preferably configured to engage the flanged
edge or border portions of the outer tray 31 and thereby
support same when the aperture frame 30 is in a
10 generally horizontal configuration.

Auxiliary conventional fastening means (not shown),
such as an adhesive, metal fasteners, or the like, may
be used to fix portions of the aperture frame 30 to
adjacent perimeter portions of aperture 21 that are
15 defined by adjacent portions of the working platform 22,
as those skilled in the art will appreciate.

The outer tray 31, as shown, for example, in Figs.
2 and 3, is provided with a border flange 74 that
preferably extends continuously around the upper
20 circumference of the outer tray 31. When the outer tray
31 is received within the aperture frame 30, the border
flange 74 is located in adjacent relationship to the
inside surface portions 72 and to the ledge 73. The
outer tray 31 is thereby supported by the aperture frame
25 30.

The relationship between the aperture frame 30, the
perimeter portions of the associated aperture 21, and
the outer tray 31 is preferably such that, when the
outer tray 31 is received in and across the aperture 21,
30 with outer tray 31 border portions adjacent to the
aperture frame 30, the outer tray 31 and the aperture
frame 30 are retained in the aperture 21. The perimeter
portions of the working platform 22 that define the
aperture 21 can be conveniently and preferably

configured to conform to the outside surface configuration of the aperture frame 30, as shown, for example, in Fig. 3.

5 Those skilled in the art will appreciate that the working platform 22, the aperture 21, the aperture frame 30 and associated components can have various structures and configurations. Various adaptations and arrangements will be suggested to those skilled in the art by the aperture formation techniques taught in
10 Schairbaum U.S. Pat. No. 6,085,431, and by the liner sleeve structures taught by Schairbaum U.S. Pat. No. 6,019,051 and U.S. patent application Ser. No. 09/232,124 filed January 15, 1999, the disclosures of which are incorporated herein by reference.

15 In the apparatus 20, as shown in, for example, Fig. 2, the aperture frame 30 is comprised of multiple components including a pair of straight opposite end components 75, a pair of straight opposite side components 76, and four substantially identical corner components 77 that are curved to extend through 90
20 degrees. Preferably, the respective opposite ends of each of these components are each adapted to engage the end of the adjacent component, a snap-fit type of interconnection being presently preferred.
25 Alternatively, the aperture frame 30 can be unitarily formed.

The outer tray 31 may, if desired, be considered to function as a primary flat monitor support tray. Preferably, in the inventive apparatus, a monitor
30 support tray is generally rectangularly configured, as illustrated, for example, by the tray 31. Thus, as shown in, for example, Fig. 2, the tray 31 has a flattened bottom wall 79 with a straight front edge portion 80, an opposed straight back edge portion 81,

and a pair of opposed side edge portions 82 and 83. The bottom wall 79 descends continuously and diagonally from the front edge portion 80 to the back edge portion 81, the back edge portion 81 being at a preselected depth relative to the front edge portion 80.

The outer tray 31 has a back wall 84 and opposed side walls 85 and 86, respectively. The walls 84, 85 and 86 upstand from their respective edge portions 81, 81 and 82 preferably vertically. Adjoining wall edge portions are preferably unitarily joined together. The height and upper edge portions of each wall 85, 84, and 86 are preferably such that the wall upper edge portions are generally equal to a plain defined by the front edge portion 80. Laterally outwardly extending from each upper edge portion and from the front edge portion 80 is the border flange 74 that extends continuously around the circumference of the tray 31.

The inner tray 32 is preferably and as shown configured similarly to the outer tray and may be considered to have corresponding edge and wall portions relative to the tray 31.

The outer tray 31 and the inner tray 32 are each conveniently and preferably provided with front and rear finger holes 35 located so as to facilitate manipulation whereby, for example, association and disassociation of tray 31 with tray 32, or of tray 31 with the aperture frame 30, is readily accomplished. The holes 35 may also, if desired, be used as access ports for (conventional) cables and wires (not shown) that are connected to a flat monitor 29. Additional holes (not shown) may be provided in trays 31 and 32, if desired. Conveniently, holes in tray 31 are formed so as to be in registration with holes formed in tray 32 when the trays 31 and 32 are associated together in a desired nested

configuration.

The inner tray 32 is preferably sized so as to be nestably received within, and removable from, the outer tray so as to achieve the fully nested configuration shown in Figs 2 and 3, for example. As so received, the border portions, and the border flange 74, of the outer tray 31 are seatable within the aperture frame 30, as above described, and as shown, for example, in Fig. 3. Thus, when the inner tray 32 is nestably received in the outer tray 31 with the inner tray 32 in the orientation shown in Fig. 2, and the outer tray 31 is set into the aperture frame 30, the apparatus 20 as associated with the work station 23 may have a configuration such as illustrated, for example, in Figs. 1 and 3.

So as to permit a user to improve, for his/her own flat monitor viewing screen viewing purposes, the location of a flat monitor resting in inner tray 32 or outer tray 32 is preferably but optionally adjustable. To achieve flat monitor adjustability, various means can be employed. Here, illustratively, the inner and outer trays 32 and 31 are each optionally, but preferably, associatable with a flat monitor positioning fence 33. The transverse position of fence 33 across, for example, tray 32 relative to the tray front edge 80 and back edge 81 portions, is user adjustable. Thus, the tray 32 is provided with a plurality of positioning holes 61 along each opposite side. Preferably, corresponding holes 61 are also provided in tray 31 with the respective holes 61 in each tray 31, 32 being aligned with one another when the trays 31, 32 are nested together as shown, for example, in Figs. 2 and 3. To use the fence 33, a user selects a pair of transversely aligned holes 61, one in each respective opposite side of, for example, tray 32. Into each hole 61 of a selected transversely aligned

hole pair 61 a different one of each of the projecting opposite ends of the fence 33 is inserted. To accomplish insertion, the fence 33 is bowed (or flexed) by the user, thereby to shorten the effective length of the fence 33 sufficiently to permit such insertion.

Conveniently, the fence 33 is comprised of molded plastic or wire members welded together at member cross-over and contact points. If desired, the respective projecting opposite ends of the fence 33 can be provided with stop means limiting the extent to which each such end can extend into a hole 61. For example, the stop means can comprise a cross wire stub (not shown) that is mounted transversely across an end-adjacent portion of each such end.

When the inner tray 32 is separated from the outer tray 31, inverted, and then reassociated with the outer tray 31, the interrelationship between the trays 31 and 32 is preferably such that a generally level surface is provided by the bottom surface of the flat bottom wall of the inner tray 32 relative to the laterally adjacent upper surface portions of the working platform 22.

For some user purposes, the inner tray 32, when separated from the outer tray 32, reversed horizontally from the orientation shown in Fig. 2, for example, and then reassociated with (or renested in) the outer tray 31, provides a useful flat monitor receiving tray structure having a back wall comprised of the inner tray 32 and a front wall comprised of the outer tray 31.

When the assembly of nested inner and outer trays 32 and 31 is separated from the aperture frame 30, inverted, reversed horizontally from the orientation shown in Figs. 2 and 3, and reassociated with (or reassociated in) the aperture frame 30, an elevated and diagonally extending (relative to the top surface of the

working platform 22) inclined flat monitor support surface is provided by the bottom surface of the bottom wall 79 of the outer tray 31, as shown in Figs. 4 and 5, for example. This inclined surface is useful as a flat
5 monitor support comparable to the support surface provided when the trays 31 and 32 are positioned and oriented as illustrated in Figs. 2 and 3, for example.

To maintain the tray 31 in nested association with the tray 32 when the trays are in the inverted
10 configuration illustrated in Figs. 4 and 5, the fence 33 can be employed since, when the fence 33 is associated with the trays 31 and 32 as illustrated in, for example Fig. 3, with the fence 33 opposite ends extending into aligned holes 61 in each of the trays 31 and 32, the
15 fence 33 in effect locks the trays 31 and 32 together.

In the alternative apparatus embodiment 46 shown in Fig. 5A, wherein components similar to those in apparatus 20 are similarly numbered but with the addition of prime marks thereto for convenient
20 identification purposes, the inner tray 32' is provided with an out-turned flange 47 which is nestably received over the border flange 74' of the outer tray 31'. Thus, when the trays 31' and 32', nested together, are inverted, the flanges 47 and 74' cooperate in a stacked
25 relationship and rest against the ledge 73' of the aperture frame 30' whereby the trays 31' and 32' are maintained together when in the inverted configuration.

Thus, the apparatus embodiments 20 and 46 provide a plurality of different configurations for use as flat
30 monitor support positions and orientations, and for aperture utilization, in and about the vicinity of the aperture 21 and working platform 22.

In Figs. 6, 6A, 6B, and 7, another embodiment 40 of the inventive apparatus is shown. The apparatus 40 is

somewhat similar to the apparatus 20 except that the apparatus 40 incorporates only a single tray 41 that has a perimeter that associates with an aperture frame 42 that can be considered, if desired, to be similar to the aperture frame 30 in structure. Perimeter portions of the tray 41 seat and engage with interior perimeter portions of the frame 42. Portions of the apparatus 40 that are similar to portions of the apparatus 20 are similarly numbered but with the addition of prime marks thereto for identification purposes.

In tray 41, the front edge 80' is provided with an out-turned flange 87 and the lower and upper edge portions of the back wall 84' are each provided with an out-turned flange 88 and 89, respectively. No flange is provided on the side walls 85' and 86'.

When the tray 41 is in the orientation illustrated in Fig. 7, to associate the tray 41 with the aperture frame 42, the tray 41 is inclined relative to the frame 42 and is extended through the aperture frame 42 so that the lower flange 88 does not engage or touch the adjacent end component 75' of the aperture frame 42. However, the front edge flange 87 and the back wall upper flange 89 are each brought into resting and abutting engagement with the in-turned ledge 73' of the opposite end components 75' of the aperture frame 42. Thus, the tray 41 is supported by the frame 42 and the tray 41 is able to support a flat monitor (not shown) in an inclined orientation relative to a user seated at the work station 23.

When the tray 41 is separated from the frame 42, inverted, inclined relative to the frame 42, and extended through the aperture frame 42 so that the back wall upper flange 89 does not engage or touch the adjacent end component 75' of the aperture frame 42, a

second useful position for the tray 41 is achievable. Thus, when the front edge flange 87 and the back wall lower flange 88 are each brought into resting and abutting engagement with the in-turned ledge 73' of the opposite end components 75' of the aperture frame 42, the bottom surface of the flattened bottom wall 79' provides a preferably generally level surface relative to the laterally adjacent upper surface portions of the working platform 22.

When, in turn, the tray 41 is separated from the frame 42 in the just described inverted configuration, and reversed horizontally from the orientation shown in Fig. 7 so that the back wall 84' is adjacent the opposite one of the opposite end components 75', a third useful position for the tray 41 is achievable. Thus, when the back upper flange 89 and the front flange 87 are each engaged with the adjacent in-turned ledge 73' of the opposite end components 75', the tray 41 has the bottom surface of its flattened bottom wall 79' largely above and inclined relative to the working upper surface of the working platform 22. This inclined surface is adapted for flat monitor support.

For purposes of flat monitor positioning, the apparatus embodiment 40 is optionally but preferably provided with a flat monitor positioning fence 33 (such as above employed in apparatus 20) and the opposite side walls 85' and 86' are provided with spaced mounting holes 61' for associating the fence 33 with the tray 41.

Those skilled in the art will appreciate that the embodiment 40 may be practiced with aperture frame components present only in opposite end regions of an aperture, if desired.

In Figs. 8, 9, and 10, another embodiment 50 of the inventive flat monitor support apparatus is shown. The

apparatus 50 may be regarded as being somewhat similar to the apparatus 40 except that here the tray 51 and the aperture frame 52 are unitarily formed as a single molded entity.

5 The apparatus 50 includes an optional lid 54. For manipulation purposes, the tray 51 and the lid 54 are provided with finger holes 66.

10 The inside perimeter of the aperture frame 52 adjacent its upper edge portion is provided with an out-turned support flange 53 and with an interior configuration that is adapted to receive and support therein peripheral portions of the lid 54, as shown in Figs. 9 and 10. More particularly, the upper edge portion of the aperture frame 52 is thickened and
15 provided with a recessed shoulder or depression 55 that is inwardly (relative to the aperture 21) located in the frame 52 adjacent to the flange 53 and that extends around the perimeter of the frame 52. When the lid 54 is associated with the frame 52, a generally level
20 working area over the aperture is provided.

 To permit flat monitor adjustability, when such is supported by the tray 51, a fence 56 and also a support 57 are optionally but preferably also provided.

25 The fence 56 is provided by a stiff straight wire 58 which extends nearly across the width of the flat monitor support and which has opposite end portions 59 and 60. The terminus of end portion 59 is receivable through one of a series of aligned but transversely spaced holes 61 in the adjacent side portion of the tray
30 51 and, similarly, the terminus of end portion 60 is receivable through one of a series of aligned but transversely spaced holes 61 in the adjacent side portion of the tray. The wire 58 with end portions 59 and 60 each engaged with a respective hole 61, each hole

61 being preferably selected to be in laterally opposed relationship to one another, acts like a fence which limits the extent of forward sliding movement of the flat monitor 29 down the incline defined by the tray 51 bottom wall. By selecting pairs of individual holes into which the respective ends 59 and 60 are inserted, the transverse location of the wire 58 can be varied so that the position of a flat monitor, such as monitor 29, on tray 51 is regulatable. A stiffening cross wire 62 preferably extends in straight, adjacent, spaced, parallel relationship to wire 58 and has downturned opposite ends that are welded or the like to adjacent regions the wire 58 near each of the end portions 59 and 60. A wire stub 49 is welded cross-wise at each such terminal weldment to limit the extent of wire 58 movement in an associated hole 61.

The support or cross bar 57 is adapted to extend almost across the width of the tray 51. On the cross bar 57 bottom surface, adjacent each of its opposite ends, a downwardly projecting peg leg 64 is provided. In the tray 51 bottom wall, adjacent each respective lateral side of tray 51, a series of holes 65 is provided. The holes 65 are in spaced, parallel relationship to each other and to each such adjacent lateral side, and the spacing between the holes 65 laterally taken across the bottom of the tray 51 corresponds to the spacing between the peg legs 64 with the holes 65 taken in pairs being matching and aligned. Thus, the cross bar 57 is adjustably positionable across the tray 51 relative to a selected top to bottom location by inserting the peg legs 64 into selected hole 65 pairs.

A feature of the support or cross bar 57 is that it has reversible opposite side faces 67 and 68 that can be

exchanged with one another. Thus one face 67 extends generally continuously and perpendicularly relative to the bottom face of the cross bar 57. The opposed face 68 extends generally diagonally relative to the bottom face of the cross bar 57 so that the transverse distance across the cross bar 57 decreases with increasing height above the bottom face. This face 68 has a series of flat surfaced steps or clefts 69 progressively defined therein that permit an edge region of a flat monitor, such as monitor 29, to rest thereon and be supported thereby. Thus, once a cross bar 57 position on the bottom face of the tray 51 is selected, then the tilt angle and position of the flat monitor 29 can be adjusted by selecting a particular step 69 upon which to rest, for example, the monitor back edge portion. The face 67 of cross bar 57, in contrast to face 68, is adapted mainly for positioning a flat monitor relative to the tray 51.

In Figs. 11, 12, and 13, another embodiment 90 of the inventive flat monitor support apparatus is shown. The apparatus 90 may be regarded as being somewhat similar to the apparatus 40, and similar parts are similarly numbered but with the addition of double prime marks thereto for identification purposes.

Here, the monitor support tray 91 is provided with side walls and end walls whose depth is sufficient to accommodate the thickness of a monitor at the shallow end 80' and yet achieve a slope for the bottom wall 79' at least comparable to that provided in the tray 41 of embodiment 40. Thus, a flat monitor, such as flat monitor 29 (shown in phantom), can be placed in the tray 91 without interference with a window or cover plate that covers the aperture 21 and is supported along its perimeter, as taught herein.

The tray 91 is provided with a thickened upper edge region 92, as illustratively shown in Fig. 12, that extends circumferentially about its walls 85' 84' and 86' and also across its forward end 80'. The thickened region 92 can be regarded as an aperture frame that is unitarily formed with these walls and end. The thickened region or aperture frame 92 terminates in an out-turned border flange 93. The region or frame 92 improves the structural strength and integrity of the tray 91. The tray 91 is conveniently provided with finger holes 96 to facilitate manipulation thereof.

The aperture 21 in the working platform 22 is also provided with an aperture frame 94 that is here illustratively similar to the aperture frame 40 in structure. The aperture frame 94 cooperates with the aperture frame 92. The depth of the in-turned ledge 73' down from the upper edge of the frame 94 is sufficient in the frame 94 to accommodate both the thickness of a plate glass window 95 and the thickness of the border flange 93, as illustrated in Fig. 12.

After the tray 91 is fitted into the aperture frame 94, with the border flange 93 becoming engaged with the ledge 73', the window 95 is associated with the frame 94. As those skilled in the art will appreciate, the window 95 may be provided with finger holes, flexible edge tabs or the like to facilitate associating and disassociating the window 95 with the aperture frame 94.

The embodiment 90 may be utilized with or without the window 95 being associated with the aperture frame 94.

Various flat monitor position and orientation adjustment means can be utilized. For example, a flat monitor positioning plate 98, such as illustratively shown in Fig. 13, may be placed on the bottom wall 79'

in the tray 91. The plate 98 adjacent one end thereof is provided with progressively arranged areas 99 of increasing thickness upon a selected one of which an end portion of a flat monitor may rest to achieve a desired flat monitor inclination angle in the tray 91.

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Various other embodiments, applications, features, alternative but equivalent structures, and the like will be apparent to those skilled in the art from the present description of the invention taken with the appended

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claims and no undue limitations are to be drawn therefrom.

What is Claimed is:

1. A flat monitor support apparatus for association with an aperture defined in a working platform, said support apparatus comprising:

- 5 - an aperture frame for extending about and associating with perimeter portions of said aperture;
- a flat monitor support tray having border portions that are positionable within said aperture frame; and
- 10 - means for supporting said border portions with said aperture frame portions when said aperture frame is in a selected orientation;

whereby, when said border portions are so supported with said aperture frame by said means for supporting, a flat monitor is supportable by said support tray.

15 2. The apparatus of claim 1 wherein said aperture frame, said flat monitor support tray and said means for supporting are unitarily formed.

20 3. The apparatus of claim 1 wherein said aperture frame and said flat monitor support tray are each separately formed, and wherein said means for supporting is defined by cooperating mutually engagable member portions that are unitarily formed with each of said aperture frame and said border portions.

25 4. The apparatus of claim 3 wherein said means for supporting comprises outwardly extending flange portions that are unitarily formed with said border portions and inwardly extending shoulder portions that are unitarily formed with portions of said aperture frame, and said flange portions are engagable with said shoulder portions when said tray is positioned within said frame.

30 5. The apparatus of claim 3 wherein said aperture frame is unitarily formed.

6. The apparatus of claim 3 wherein said aperture frame is comprised of a plurality of separate frame components.

5 7. The apparatus of claim 3 wherein said support tray is unitarily formed.

8. The apparatus of claim 7 wherein said aperture frame includes shoulder portions that are unitarily formed and that inwardly extend, and wherein said support tray border includes outwardly extending flange portions, whereby said support tray is supportable by said aperture frame when said tray is positioned within said frame.

9. The apparatus of claim 8 wherein said support tray is generally rectangularly configured with:

15 - a flattened bottom wall portion that has a front edge portion, a back edge portion that is generally opposed to said front edge portion, and a pair of opposed side edge portions,

- said bottom wall descends from said front edge portion to said back edge portion to a preselected depth,

20 - a back wall and opposed side walls that each upstand generally vertically from said back edge portion and said side edge portions,

25 respectively, to define upper edge portions that each have a height that is generally equal to the plain defined by said front edge portion, and

- flange portions outwardly extending from each of said front edge portion, and said upper edge portions of said back wall and said side walls,

30 whereby said flange portions are engagable with said shoulder portions and said support tray is supported by said aperture frame.

10. The apparatus of claim 9 wherein said support tray has finger hole means defined therein for support tray association and disassociation with said aperture means.

5 11. The apparatus of claim 7 wherein said support tray is provided with an inner tray which is configured similarly to said support tray and which is nestably and removably receivable within said support tray.

10 12. The apparatus of claim 11 wherein said inner tray has finger hole means defined therein for inner tray association and disassociation with said support tray.

15 13. The apparatus of claim 11 wherein, when said inner tray is separated from nesting association with said support tray, inverted, and reassociated with said support tray, the bottom wall portion of said inner tray is generally about level with top portions of said aperture frame whereby the top surface of said working platform is approximately coextensive with said bottom wall of said inner tray.

20 14. The apparatus of claim 3 wherein the relationship between said aperture frame, said support tray, and said means for associating is such that said support tray is separatable from said aperture frame, invertable, and reassociatable with said aperture frame whereby at least a portion of the bottom surface of said support tray is elevated relative to said working platform and is configured to support a flat monitor.

25 15. The apparatus of claim 12 wherein said bottom surface of said support tray as so elevated is adapted to so support said flat monitor at an inclined angle.

30 16. The apparatus of claim 1 wherein said aperture frame is adapted to associate with a cover plate whereby said aperture is covered.

17. The apparatus of claim 16 wherein said cover plate is transparent.

5 18. The apparatus of claim 16 wherein said the relationship between said aperture frame, said support tray, said means for associating, and said cover plate is such that said cover plate is above said support tray when said cover plate is so associated with said aperture frame.

10 19. The apparatus of claim 16 wherein said cover plate is removably associated with said aperture frame.

20. The apparatus of claim 19 wherein said cover plate has finger hole means defined therein for cover plate association and disassociation with said aperture frame.

15 21. The apparatus of claim 1 wherein said support tray is associated with a position adjustable flat monitor support fence.

20 22. The apparatus of claim 1 wherein said support tray is associated with an adjustable flat monitor angle regulator.

23. A flat monitor support apparatus for association with an aperture defined in a working platform, said support apparatus comprising:

- 25 - an aperture frame for extending about and associating with perimeter portions of said aperture;
- a flat monitor support tray having border portions that are positionable within portions of said aperture frame;
- 30 - said aperture frame having inwardly extending shoulder portions;
- said border portions having outwardly extending flange portions that are engagable with said

shoulder portions when said flat monitor support tray is adjacent to said aperture frame; whereby, when said flange portions are so engaged with said shoulder portions with said aperture frame in a
5 predetermined orientation, said flat monitor support tray is supported by said aperture frame and a flat monitor is supportable by said support tray.

24. The apparatus of claim 23 wherein said
10 shoulder portions extend around inside portions of said aperture frame, and wherein said flange portions extend around border portions of said flat monitor support tray.

25. The apparatus of claim 23 wherein said flat
15 monitor support tray is disengagable from said engagement with said aperture frame.

26. The apparatus of claim 23 wherein said
aperture frame is also adapted to support a cover plate
. over said aperture.

27. The apparatus of claim 26 wherein said flat
20 monitor support tray is configured to support a flat monitor in non-interfering relationship with an adjacent cover plate that is so supported by said aperture frame.