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(54) **SHELF ASSEMBLY**

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(57) **ABSTRACT**

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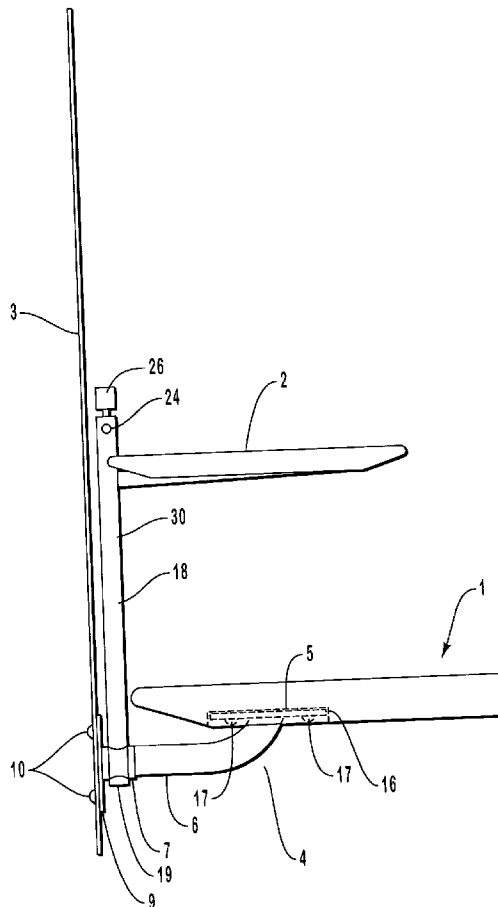
Related U.S. Application Data

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(30) **Foreign Application Priority Data**

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A work station support comprises two mounting brackets arranged in use to be attached to a work station top at a spaced relationship. Each mounting bracket has a fixing plate and an arm extending from said fixing plate. Two separate key hole slots are formed on each fixing plate at a locus about a center of rotation of the fixing plate. The key hole slots are formed to engage studs projecting from the table top when the fixing plates are rotated in opposite directions. A post upwardly extends from each mounting bracket. Outwardly projecting from the top end of each post is an arm. A shelf is supported on and extends between the arms. A rail also extends between the posts and functions as a back stop for the shelf. A retainer is slidably mounted on the rail and partially extends across the shelf.



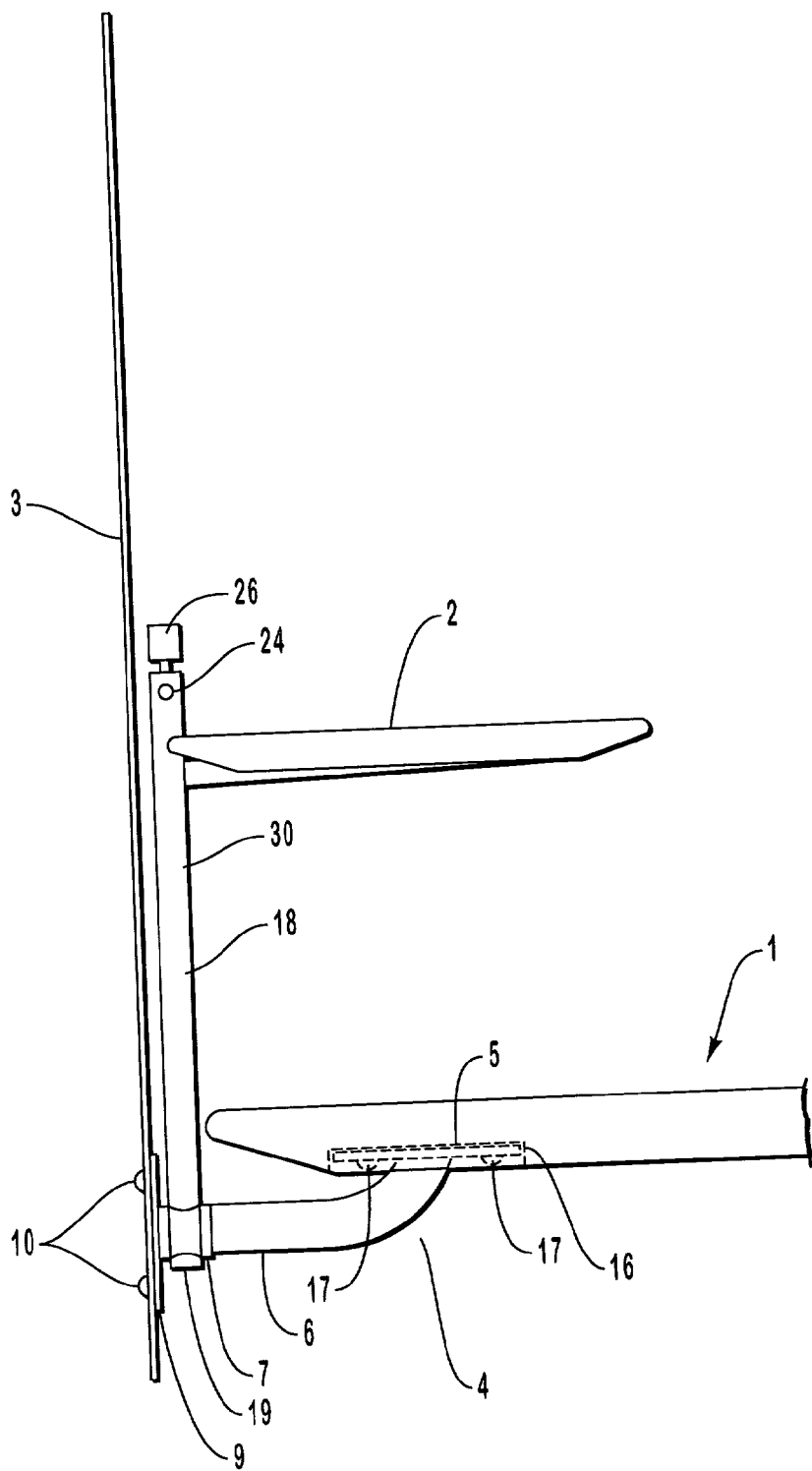


FIG. 1

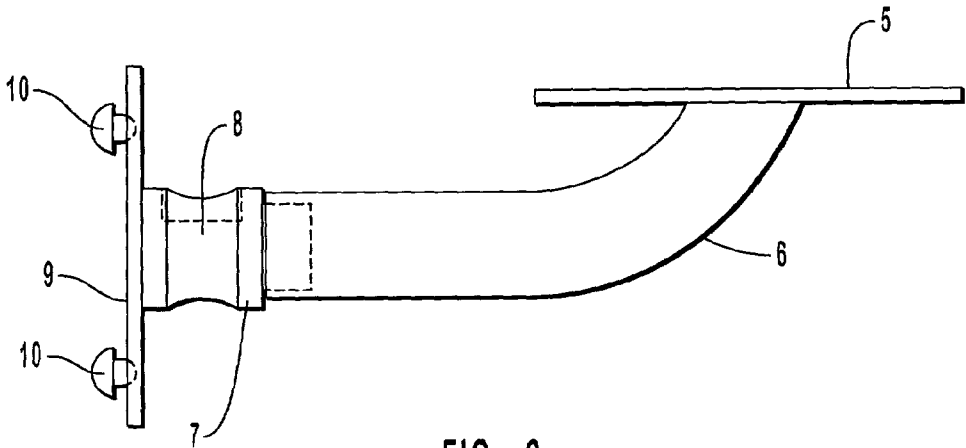


FIG. 2

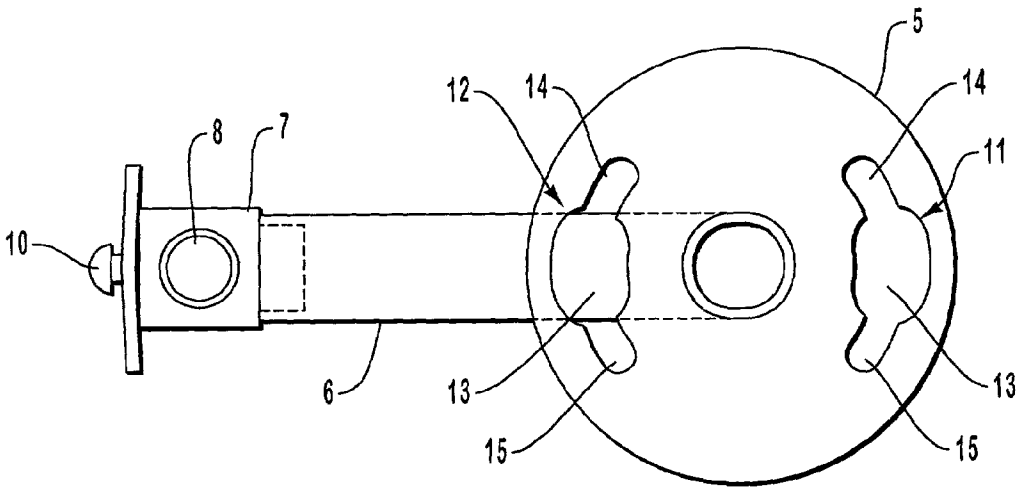


FIG. 3

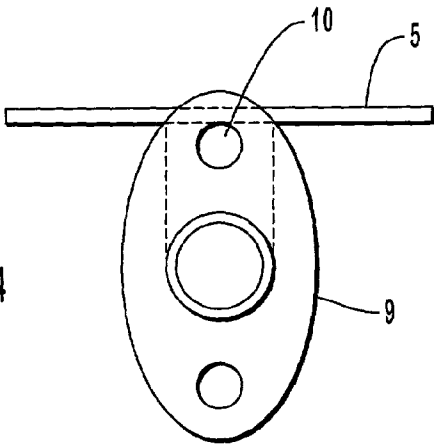


FIG. 4

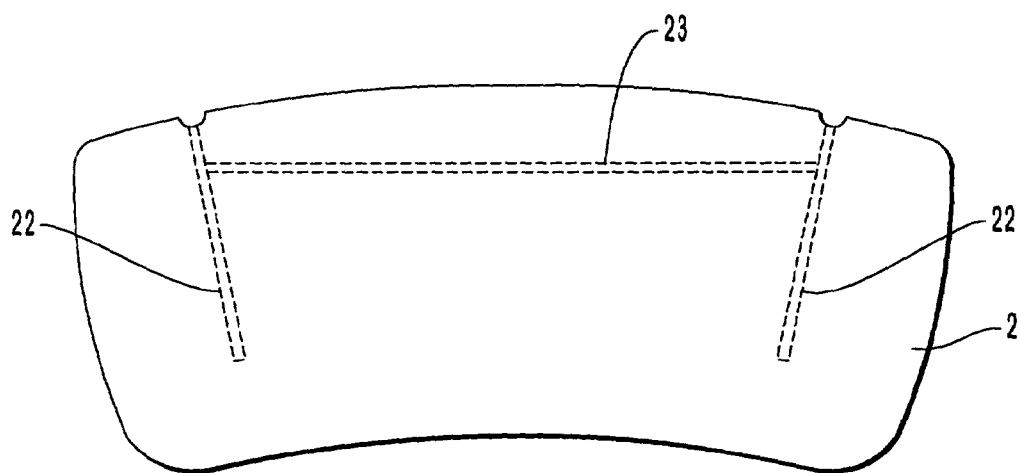
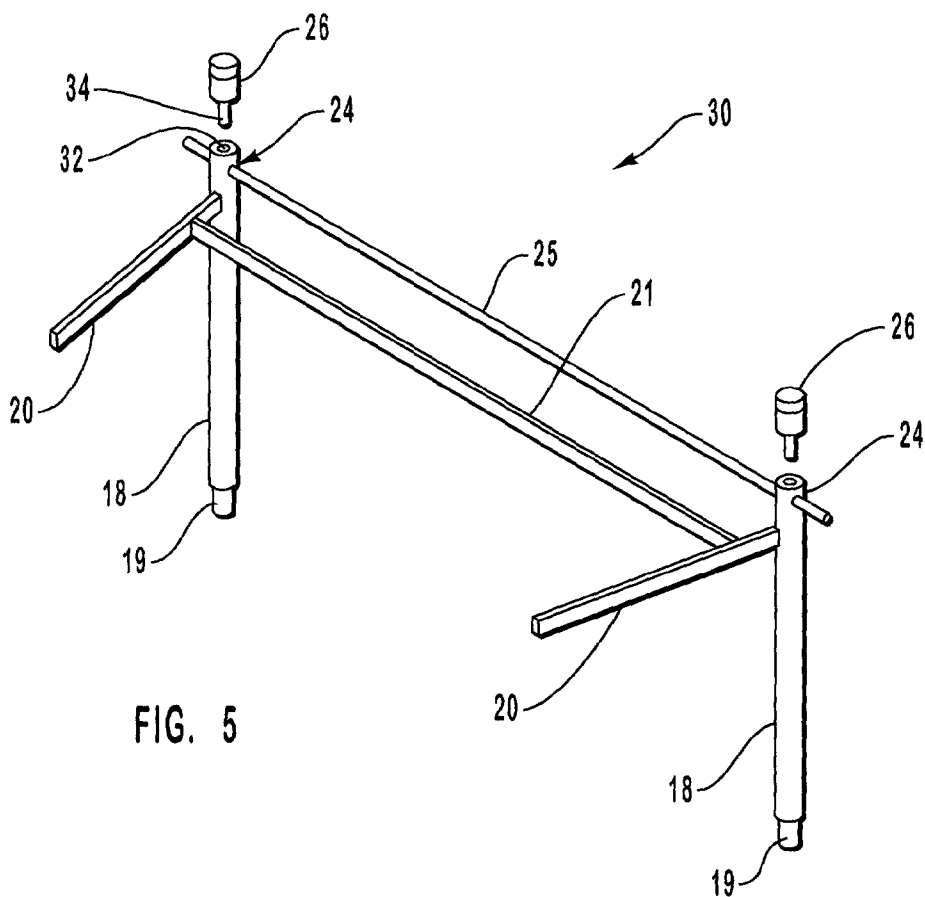


FIG. 6

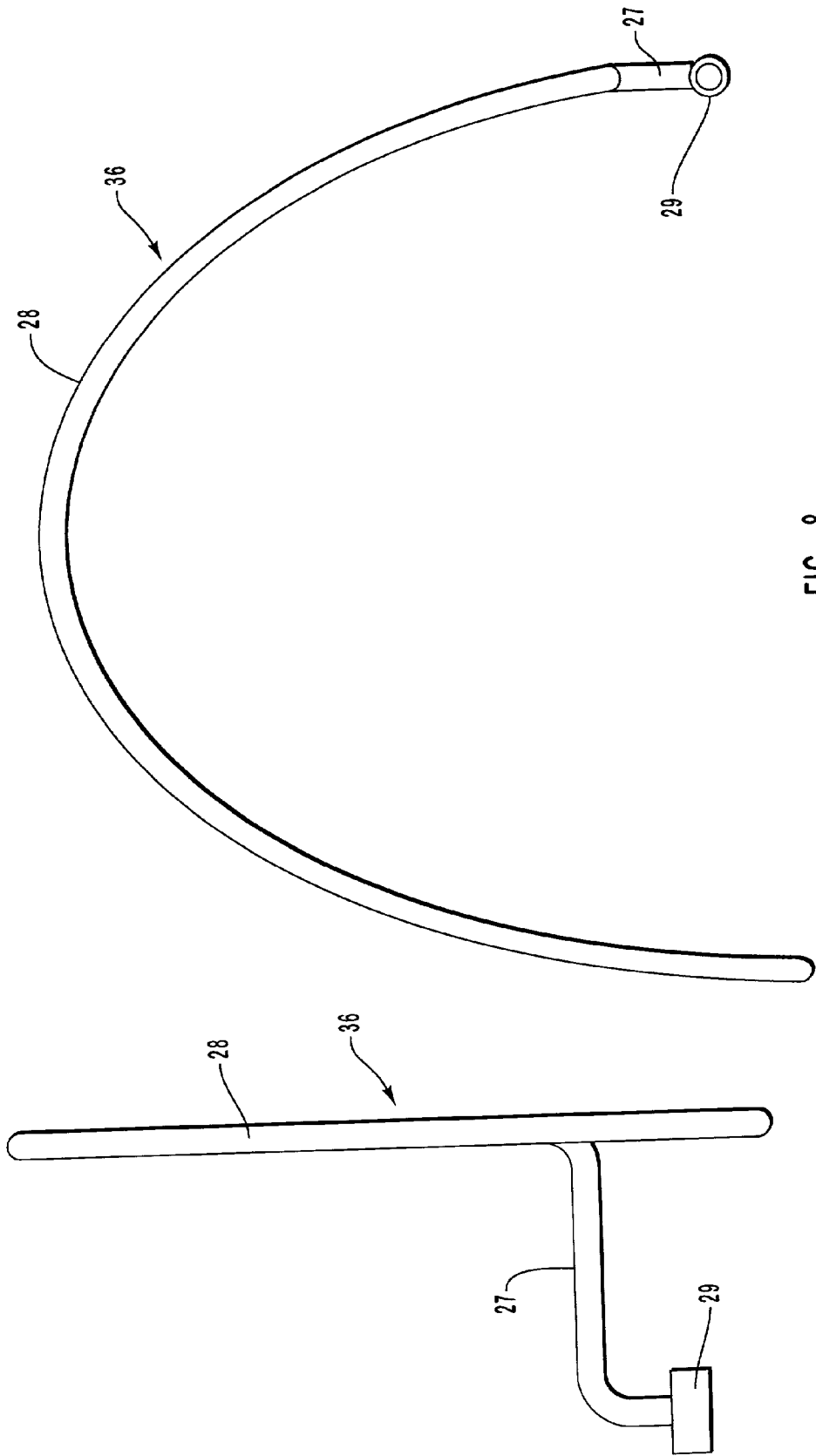


FIG. 8

FIG. 7

SHELF ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional of U.S. patent application Ser. No. 09/446,936, filed Mar. 30, 2000, titled WORK STATION SUPPORT AND/OR A MOUNTING BRACKET USED IN SAID WORK STATION SUPPORT which is a nationalization of International Application No. PCT/NZ98/00088, filed Jun. 22, 1998 which claims priority to New Zealand Application No. 328,194, filed Jun. 26, 1997, which applications are incorporated herein by specific reference.

BACKGROUND OF THE INVENTION

[0002] 1. The Field of the Invention

[0003] This invention relates to a shelf assembly and corresponding work station support.

[0004] 2. The Relevant Technology

[0005] In the modern office environment, a work station should be designed to provide an ergonomically acceptable and convenient environment for a worker. Included in the requirements is a need for work station supports which can carry shelves or screens to create the required holding space and space separation. "Work Station" as used in this specification is intended to cover any operator area where there is a desk or top for enabling office type work to be undertaken.

[0006] There are many systems recognized for providing a stable support for shelves associated with a working environment, for example, the universal shelf system disclosed in U.S. Pat. No. 4,098,408, the means of providing a convenient fitting for a cantilever shelf as disclosed in U.S. Pat. No. 4,736,918, and the means of locking the shelf in position as disclosed in U.S. Pat. No. 4,324,379. Within the modern office environment it is desirable to provide a fitting for supporting a shelf or screen which can be engaged in position and once in position held or locked in place. It is also advantageous if assembly can be preformed without the assistance of a skilled artisan and preferably without requiring any tools.

BRIEF SUMMARY OF THE INVENTION

[0007] The present invention is directed to providing a work station support which is effective and secure in use but which may be easily assembled or dismantled so as to allow the corresponding work station to be adapted for changing conditions in the work place.

[0008] In one aspect the invention consists of a work station support comprising two mounting brackets arranged in use to be attached to a work station top at a spaced relationship, each mounting bracket having a fixing plate and an arm extending from said fixing plate, two separate key hole slots formed in said fixing plate at a locus about a center of rotation of said fixing plate, the wider part of each key hole slot being adapted to engage over the head of a mounting stud in use and upon rotation of the fixing plate for the studs to be moved to the narrower part of each key hole slot for engaging the mounting bracket to the work station with the end of the arm when the fixing plate is in the engaged position locatable in an accessible position, said

key hole slots being formed to require the fixing plates to be rotated in opposite directions to move to the engaged position, holding means at or adjacent the end of each arm support means engageable with said holding means when the mounting brackets are engaged in position with the fitting support means locking each mounting bracket in the engaged position.

[0009] In another aspect the invention consists in a mounting bracket comprising a fixing plate arranged to engage the surface of a work station top, an arm extending from said fixing plate with the end of the arm arranged in use to be located in an accessible position when the fixing plate is engaged with the work station top, holding means at or towards the free end of the arm, two separate key hole slots in said fixing plate, said key hole slots being formed on a locus about a center of rotation of said fixing plates so that in use the wider part of each key hole slot may be engaged over the heads of mounting studs and the fixing plate rotated to move the studs to the narrower part of the key hole slot so that the fixing plate in use is engaged with the work station top.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which:

[0011] FIG. 1 is an elevation showing a work station support according to the present invention fitted in place on a work station;

[0012] FIG. 2 is a side elevation of the mounting bracket used in the work station support;

[0013] FIG. 3 is a plan view of the mounting bracket in FIG. 2;

[0014] FIG. 4 is an end view of the mounting bracket;

[0015] FIG. 5 is a detail of the support posts and shelf support frame in the work station support;

[0016] FIG. 6 is a detail of the under surface of a shelf to be supported on the shelf support arms;

[0017] FIG. 7 is an elevation of a retaining arm associated with the shelf on the work station support; and

[0018] FIG. 8 is a side view of the retaining arm.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0019] The present invention is designed to provide a work station support which will allow the mounting of a shelf or shelves and/or a screen relative to a work station top. The work station top may be the top of a desk or a bench or any other flat work surface that is located and designed to provide a working environment for a worker.

[0020] In FIG. 1 the work station top 1 has associated therewith a shelf 2 and a screen 3 using the work station support according to the present invention. The work station support has two mounting brackets 4 attached to the under surface of the work station top 1 at a spaced relationship.

[0021] The mounting bracket 4 is detailed in FIGS. 1-4 of the drawings and has a circular fixing plate 5 with an arm 6 extending centrally from the under surface thereof. The arm

6 is arranged so that in use the end or head 7 of the arm 6 protrudes beyond the edge of the work station top 1. In use the circular fixing plate 5 of each mounting bracket 4 is fixed in a complimentary recess extending in from the under surface of the work station top 1 as will be described here below.

[0022] An aperture or socket 8 is formed through the head 7 and located, when the bracket 4 is engaged in place, so that a post supported in the aperture 8 will rise substantially vertically from the work station top 1.

[0023] A face plate 9 is attached to the outer end of the head 7. Located on the outside face of the face plate 9 are two headed studs 10 which are substantially in line with the axis through the aperture 8. The headed studs 10 are arranged to engage with apertures in the screen 3 to enable the screen 3 to be supported in a position as illustrated in FIG. 1.

[0024] As depicted in FIGS. 2-4, the circular fixing plate 5 of the mounting bracket 4 has formed therein two key hole slots or openings 11 and 12 preferably arranged diametrically opposed to each other and on a locus about the center of the plate 5. Each key hole slot 11, 12 has a central aperture 13 with narrower extensions 14 and 15 on the locus about the center of the plate 5 and extending in either direction from the central aperture 13. This gives an either handed operation to the brackets 4. It is understood, however, that it would be possible within the ambit of the invention to create the mounting brackets 4 so that the key hole slots 11, 12 function with either a left or right handed operation. Also, while less convenient, the mounting bracket 4 could operate with other than a circular fixing plate 5 and with the keyhole slots 11, 12 arranged in other than a strictly diametrical opposed configuration.

[0025] On the under side of the work station top 1 is formed a circular recess 16 of a size to cooperatively receive the circular fixing plate 5. Two headed studs 17 are pre-positioned in the recess 16 and are arranged to be engaged by the key hole slots 11, 12 in the fixing plate 5. This means that the fixing studs 17 are located so that they do not protrude from the under surface of the work station top 1, thereby ensuring greater convenience in handling the work station top 1 during transportation to the site for assembly.

[0026] When the work station has been assembled, the two sites for the mounting brackets 4 each have fixed thereto a mounted bracket 4 by engaging the fixing plate 5 over the studs 17 and rotating the arms 6 towards each other. This operation takes advantage of the either handed operation of the key hole slots 11, 12 in the fixing plates 5. Furthermore, this operation can quickly and easily be preformed without any tools being required and leaves the mounting brackets 4 in an engaged position extending from the work station top 1 ready to receive a screen or a shelf support frame.

[0027] Once the mounting brackets 4 have been fitted in place, the screen 3 can be engaged from the headed studs 10. In this configuration, the screen 3 operates in part to retain the mounting brackets 4 in place. Alternatively, as depicted in FIG. 1, a shelf support 30 can be engaged with the arms 6 and will also serve the same function. Clearly, as illustrated in FIG. 1, both the screen 3 and shelf support 30 can, if desired, be fitted at the same time.

[0028] The shelf support 30 is illustrated in FIG. 5 and comprises two posts 18 each having a lower end 19 of

reduced diameter to engage through the aperture 8 of mounting brackets 4. In the illustrated preferred example, shelf support 30 is provided with two arms 20, one extending from each post 18. The two arms 20 are joined together by a connecting brace 21 extending therebetween. As a result of connecting brace 21, when the posts 18 are engaged in apertures 8 of the mounting brackets 4, the mounting brackets 4 are not free to rotate and hence are locked in position. That is, connecting brace 21 prevents the rotation of mounting brackets 4 in opposite directions.

[0029] The shelf 2 is configured for mounting on shelf support 30. Specifically, the under surface of shelf 2 has complimentary grooves 22 into which will fit the arms 20 and a groove 23 into which the connecting brace 21 will engage. The connection between shelf 2 and shelf support 30 may be affected by any suitable fastening means but preferably it has been found desirable to fix the shelf 2 in place by using an adhesive to retain the arms 20 and brace 21 in their respective grooves.

[0030] Within the ambit of the invention it would be possible to have a different shelf support to hold the shelf 2. It would be desirable, however, to ensure that once the posts 18 of the shelf support are in position, there is a locking action to retain the mounting brackets 4 in position in case this function was not fulfilled by the screen 3. The manner in which the shelf 2 is connected to the posts 18 could utilize any of the numerous means of allowing detachable attachment of shelves to the posts.

[0031] For convenient operation at a work station, one of the requirements is to retain in a tidy manner the material stored on the shelf 2. As depicted in FIG. 5, the present invention addresses this requirement by providing a back rail 25 extending through an aperture 24 appropriately positioned towards the top of each post 18. The top of each post 18 preferably includes a threaded aperture 32 into which a threaded stem 34 of a top 26 may engage. When stem 34 is received within aperture 32, stem 34 engages against back rail 25 so as to lock or retain the back rail 25 in position.

[0032] The back rail 25 provides a back stop for articles on the shelf 2 but also, more importantly, ensures a support for retaining arms that can be used to retain articles on the shelf 2. A retaining arm 36 is illustrated in FIGS. 7 and 8 of the drawings. Two such retaining arms 36 are provided in an opposite handed relationship on the back rail 25. The back rail 25 and retaining arms 36 could be dispatched separately and could be assembled on site without requiring any tools for such fitting.

[0033] Each retaining arm 36 comprises a bush 29 having a slidable fit on the rail 25. An arm 27 is shaped to extend up and away from the bush 29 effectively parallel with the rail 25. The arm 27 then continues as an arc or suitably shaped end 28 to act as a holder or stop. Any force against the section 28 of the arm will tilt the bush 29 causing it to engage or lock on the rail 25, thus effecting the retaining action required. By a suitable pressure to relocate the bush 29, the retaining arm 36 can be located so that the bush 29 can freely slide along the rail 25. In this way a convenient retaining means is formed on the back rail 25 to be used in association with the shelf 2.

[0034] The present invention desirably encapsulates the advantages for the work station support provided by the

mounting bracket **4** and the shelf support **30** but an effective support could be achieved using a fixing plate which is fixed by more conventional fastenings such as by screws into the under surface of the work station top **1** while still preserving the remaining features of the present invention as disclosed and it is intended that this should be incorporated within the ambit of the present invention.

[0035] As stated above the screen **3** can be fitted separately or it may be included with the shelf support **30**. In many instances it will be desirable for a screen to be fitted by itself.

[0036] Where the screen **3** is supplied, it is desirable to ensure that there is a degree of height adjustability. This can be achieved by providing a plurality of apertures and vertical rows spaced to correspond with the location of the studs **10** on the face plate **9** of the fixed mounting brackets **4**. The screen **3** can be of any convenient material. Preferably a perforated metal screen is both aesthetically pleasing and convenient for fitting in position to retain the mounting brackets **4** in place. Selecting the appropriate apertures to determine the height of the screen **3** allows the screen **3** to be fitted by engaging the screen apertures over the head of the stud **10** and allowing the screen **3** to drop into the supported position. The screen **3** can assume the peripheral shape of the work station periphery allowing for a flexibility in design that is desirable in the modern working environment.

[0037] The present invention thus has a number of advantages in establishing a modern and conveniently adjustable work station support for a shelf or shelves or a screen associated with a work station top in an office or office type environment.

What is claimed is:

1. A shelf assembly comprising:
 - a shelf having a front, a back, and a length direction;
 - a rail having a longitudinal axis extending substantially in the length direction of the shelf, the rail being disposed adjacent the back of the shelf and above the level of the shelf so as to act as a backstop;
 - a retainer comprising:
 - an engagement portion at least partially encircling the rail such that the engagement portion can selectively slide along the length of the rail, the retainer being selectively movable to a tilted position which causes the engagement portion to engage the rail so as to prevent unwanted sliding of the engagement portion along the rail; and
 - a retaining arm extending transversely across the shelf to act as a holder or stop for items on the shelf, the retainer being pivotable about the longitudinal axis of the rail.
2. The shelf assembly as claimed in claim 1 wherein the rail is in the form of a rod and the engagement portion is in the form of a bush.
3. The shelf assembly as claimed in claim 2 wherein the bush has a length exceeding the internal diameter.
4. The shelf assembly as claimed in claim 1 wherein the retaining arm includes an arc shaped portion extending across the shelf in a plane substantially orthogonal to the plane of the shelf.
5. The shelf assembly as claimed in claim 4 wherein the retaining arm includes a first portion extending between the engagement portion and the arc shaped portion, the first portion being disposed effectively parallel with the rail.
6. The shelf assembly as claimed in claim 5 wherein the engagement portion, the first portion, and the arc shaped portion are of integral construction.
7. The shelf assembly as claimed in claim 6 wherein there are two retainers with the respective first portions arranged to extend in opposite directions.
8. The shelf assembly as claimed in claim 1, further comprising two upright posts, a shelf supporting arm extending each post, the shelf being supported on the shelf support arms, and the rail extending between the two posts.
9. A workstation support for a workstation top, the workstation support comprising:
 - a first mounting bracket comprising:
 - a first arm having a first end and an opposing second end, the second end of the first arm being adapted for selective attachment to the workstation top; and
 - a first holder provided at or adjacent to the first end of the first arm;
 - a second mounting bracket comprising:
 - a second arm having a first end and an opposing second end, the second end of the second arm being adapted for selective attachment to the workstation top; and
 - a second holder provided at or adjacent to the first end of the second arm;
 - a shelf frame comprising a first post attached to and upwardly projecting from the first holder and a second post attached to and upwardly projecting from the second holder; and
 - a shelf supported by the shelf frame.
10. The workstation support as claimed in claim 9 further comprising:
 - a rail extending between the first post and the second post; and
 - a retainer comprising a bush slidably mounted on the rail and a retaining arm projecting from the bush so as to extend over at least a portion of the shelf.
11. The workstation support as claimed in claim 10 wherein the retaining arm comprises an arc portion lying in a plane substantially orthogonal to the plane of the shelf and extending transversely across the shelf.
12. The workstation support as claimed in claim 10 wherein the rail is disposed higher than the shelf such that the rail acts as a backstop for the shelf.
13. The workstation support as claimed in claim 9 further comprising:
 - a first face plate mounted on the first holder;
 - a second face plate mounted on the second holder; and
 - at least one headed stud projecting from the first face plate and the second face plate.
14. The workstation support as claimed in claim 13 further comprising a screen mounted on the headed stud of the first face plate and the second face plate.

15. A mounting bracket for a workstation, the mounting bracket comprising:

- an elongated arm having a first end and an opposing second end;
- a holder having an aperture formed therein, the holder being disposed at or adjacent to the first end of the arm;
- a fixing plate disposed at or adjacent to the second end of the arm, the fixing plate being adapted for selective attachment to the workstation;

a face plate mounted on or adjacent to the holder; and
a headed stud projecting from the face plate.

16. The mounting bracket as claimed in claim 15, further comprising a screen removably attached to the headed stud projecting from the face plate.

17. The mounting bracket as claimed in claim 15, further comprising an elongated pole removably coupled within the aperture of the holder, the pole extending above the workstation when the fixing plate is attached to the workstation.

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