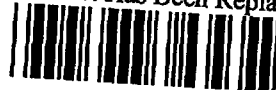


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REPLACEDIMPROVED PARTITION WALL

This invention relates to a wall unit suitable for use as part of a modular system for partition walling. Various different partitioning systems have previously  
5 been proposed for sub-dividing large open areas. The present invention relates to a wall unit suitable for use in similar partitioning systems but offers flexibility not heretofore provide in earlier systems. The invention has particular application for office partitioning but is not limited to such application.

Generally, modular wall units give to interior designers flexibility in the  
10 spacial arrangement of partition walls so to create spaces for offices, work stations and the like configured to meet the individual users' needs. Whilst prior systems have provided flexibility in spacial configuration, they have provided little flexibility for the interior designer in producing a range of different design appearances within the one system. Generally, the range of heights and the  
15 range of different external appearances for any particular partition wall system has been limited.

Partition systems of the type with which the invention is concerned usually provide standard structural and other components that are capable of being assembled together. They provide a versatile means for economically  
20 establishing a desired work place or office layout that may include various work station designs. Furthermore, structural components may be such that they can be readily disassembled and then reassembled to provide an altered work place or office layout or work station design. The basic structural components of such a system are modular wall panels and posts to which the wall panels may be  
25 attached. Further components may include means for locating and/or supporting various working surfaces, shelving, cabinets and the like. They may also include means for management of electrical power and communications cabling. Other standard components include work surfaces, shelves, brackets, cabinets, decorative and finishing items such as caps and sills and fasteners.

30 It is an object of the present invention to provide a wall unit suitable for use as a modular component in a wall partitioning system where the wall unit is configured so to enable changes in height and appearance which do not involve substantial constructional changes.

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Accordingly, in a first aspect of the present invention, there is provided a partition wall unit which has upper and lower panels both of which are held in position at either end by respective end posts wherein at least the lower panel includes attachment fittings adapted to engage with the end posts and wherein

5 each end post includes securement means adapted to retain the lower panel in position; said securement means being operable so to permit repeated engagement and disengagement of the lower panel to the end posts.

Preferably, the upper panel is held in position between the end posts by different means to that utilized for securing the lower panel between the said

10 posts. Preferably the lower panel constitutes a significant structural component of the partition wall and is firmly connected and engaged with the end posts, whereas the upper panel is less securely engaged thereto and does not constitute a significant structural component of the entire assembly.

Most preferably, the upper panel is held in position between the posts but

15 is not secured thereto. This may be effected by any non-securing engagement mechanism as is known in the art. Preferably, the upper panel is slidably engageable with the posts. Most conveniently, each end post includes a longitudinal channel extending from a position proximate to the bottom of the post to the top of the post. In such an arrangement, it is preferred that the attachment

20 fittings of the lower panel be located along the edges of the respective ends of the lower panel and that the attachment fittings be adapted so to engage within the channels in the respective end posts. In this arrangement, it is preferred that the upper panel be held in position by the edges of the upper panel by sliding engagement into the top portions of the channels in the posts. In such an

25 arrangement, it is preferred that there be no obstruction in those parts of the respective channels into which the upper panel is received.

Those skilled in the art will readily appreciate that the upper and lower panels may alternatively be provided with a slot or channel into which the end post may be slidably engaged.

30 The end posts should include securement means by which the lower panel may be fixedly retained within the respective end posts. This may be achieved by any of a number of clamping systems as are known in the art. The upper panel is preferably shaped so to be slidably engageable within the channels in the end

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posts and is preferably not otherwise secured to the posts.

In one particularly preferred embodiment of the invention, the end posts both include at least one longitudinally extending open channel for receiving an attachment fitting of a lower panel in which the channel includes means adapted to clamp said attachment fitting to the end post thereby to fix the lower panel in position and in which the means for clamping is operable from the top end of the said post.

Preferably, the means for clamping the attachment fittings to the end posts includes in each post two fittings which are spaced apart along the longitudinal channel in the post, wherein each fitting is engageable with the respective top and bottom end of the attachment fitting of the lower panel and wherein the relative spacing of the fittings within the channel is adjustable from the top end of the post. One of the said fittings may be fixed within the channel and the other adjustable relative thereto by a screw means that is accessible from the top end of the post. In a particularly preferred embodiment, a bottom fitting for each of the end posts provides one of the said fittings and the other is provided by a clamp plate which is fixed within the channel and proximate to but spaced from that position of the post adjacent the top edge of the lower panel once fixed in position. In this preferred embodiment a tie rod, which is accessible at the top end of the post may connect with the bottom fitting for adjustment of the relative spacing of the two fittings.

The positioning of a top fitting such as a clamp plate within the channel and spaced from the top of the post enables the lower panel to be clamped yet leave a top portion of the open channel of the post unobstructed for sliding engagement of the edge of the upper panel in accordance with the invention. This arrangement permits simple and economical variation of the appearance of the wall unit by changing the upper panel without disassembling the major structural components being the posts and lower panels.

Preferably, the attachment fitting of a lower panel is constituted by a portion of the frame surrounding the panel. The frame generally includes a longitudinally extending hollow rib section along its edge face and preferably the two clamp fittings within the end post both include ramp surfaces for engaging the respective ends of the said hollow rib section formed along the edges of the

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panel.

Preferably, the end posts both include at least two open channels, each for receiving an attachment fitting of a respective lower panel and each including means as described above adapted for clamping to the attachment fitting of a said respective lower panel. The two channels may be on opposite sides of the post such that two attached lower panels will form a straight wall section. Alternatively, the channels may be disposed on the post such that a corner is established by two panels meeting at right angles when they are attached to the end post. Most preferably the end posts are of a type as described in co-pending Italian patent application T094A000734 as filed by the applicant. The disclosure in the said Italian application is applicable to the present invention and is hereby incorporated.

When the wall unit of the invention is used as a modular component for creating office partitioning, it is desirable that it include means for the attachment of supporting shelves or work surfaces. In this event, the post desirably includes support means within the longitudinal extending channel to which a shelving or work surface bracket or fixture can be attached. Alternatively, or in addition, the end post (or posts) may incorporate a separate post cap incorporating a transverse channel adapted to co-operate with a shelf bracket. In the embodiment incorporating the support means within the longitudinal channel in the end post, the support means is preferably captive within, but slidable along, the longitudinal channel so that the position of the shelving or work surface when it is supported by the bracket is adjustable relative to the posts. Preferably, the support means is a strip that contains slots for receiving a complimentary tongue of a bracket such that the bracket is supported by and extends at rights angles from the strip. The channel is preferably partially closed by a transverse flange along each edge of the channel whereby the flanges hold the said support means captive within the channel.

Where the end post includes such support means, it is preferable that the post also include means for adjusting the position of the support means along the channel. The adjustment means should be readily accessible and operable externally of the post. For example, the adjustment means may be a rack for interconnection with a pinion. Thus, one embodiment of the post used in this

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aspect of the invention may include teeth extending along a longitudinal edge of the support means for meshing with the teeth of a pinion gear locatable within the post and which may be operable externally of the post. A power driven means may be provided for adjusting the position of the support means in this way.

5 It will be appreciated that in a partitioning system that incorporates a wall unit according to this aspect of the invention, the slidable support means in each end post may be operably connected such that they are coordinately adjustable whereby a work surface or shelf supported between the two slidable support means may be raised or lowered as a whole and maintained level without having  
10 to disturb or remove items resting on the work surface or shelf. This feature contributes to the versatility of the invention and provides a readily operable height adjustment facility for any part of a work station that is carried by the slidable support means.

An end post according to this aspect of the invention may include two  
15 channels each of which captively and slidably receive an adjustable support means. Preferably the two channels are oppositely disposed along the post.

It should be appreciated that with each of the embodiments described above that the upper panel not being fixedly engaged within the posts can readily be fitted once the lower panel is fixed in position and that a range of different  
20 modular components can be used to meet the users needs both functionally and visually. For example, the upper panel might be a transparent glass sheet, a patterned board or an opaque material. As the end posts extend above the lower panel, the designer may readily change the appearance of the partition wall once it is assembled and in place by removing the upper panel and replacing it with a  
25 panel of different height or design without disturbing the lower panel and the structural configuration of the partition wall.

In one particularly preferred embodiment of the invention, an upper panel which is thinner than the lower panel is utilized. Most preferably the upper panel is positioned between respective channels in the end posts and is of substantially  
30 equal width to the width of the channels. This creates a ledge between the upper and lower panels and confers a different visual configuration to modular partitioning which is conventionally of uniform thickness.

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In use, individual wall units such as those described can be used together to form partition walls in which the lower panel of each unit is of substantially the same height but where the upper panel is of various different heights. Thus, for example, a modular office partitioning system using the wall units of the invention  
6 can be created so that general work areas might utilize an upper panel which might be a relatively short glass panel for operators to easily communicate over the partition wall but in a further part of the office, and using the same partitioning units, where privacy may be more important (such as in an accounting area) the upper panels may be higher and opaque. The present invention provides the  
10 interior designer with the flexibility to incorporate these changes for functional and aesthetic reasons within an overall modular system which has a unifying theme being the shape and design of the lower panel and posts.

It is convenient hereinafter to describe the invention according to various aspects by reference to a particular form of partitioning system utilizing a wall unit  
15 of the invention. This is shown in the accompanying drawings. However, it should be understood that each aspect of the invention may be applied to partitioning systems having other forms. Furthermore, the example partitioning system hereinafter described includes various aspects of the invention but not all of these aspects may be adopted in practice according to the particular end user  
20 requirements. Also, the specific form and arrangement of the various features in the drawings is not to be understood as limiting the invention. In the drawings:-

Figure 1 is a perspective view of a partitioning system embodying the invention;

Figure 2 is a plan view of a work place layout using a partitioning system  
25 embodying the invention;

Figure 3 shows a modular wall unit and upper panel in accordance with the invention;

Figure 4 is an exploded perspective view showing the clamping of a lower panel to an end post according to the invention;

30 Figure 5 is a cross section view of a lower panel to end post connection;

Figure 6 is a longitudinal section of the assembled panel for post clamping arrangement as shown in the Figure 4;

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Figure 7a is a sectioned view of part of an end post showing adjustable support means;

Figure 7b shows details of an adjustable support means for the post as shown in Figure 7a;

5 Figure 8 is a perspective view of an end post;

Figure 9 illustrates an adjustment arrangement;

Figure 10 illustrates a cap for use with an end post such as that shown in Figure 6; and

10 Figure 11 illustrates the cap shown in Figure 10 in partition on top of an end post and engaged with a shelf/hanger bracket.

A partitioning system as shown in Figures 1 and 2 comprises structural components including lower panel 1 connected to end posts 2 and includes work surfaces 3 carried by supports 4. Work surfaces 3 may also be supported by end posts 2 as will be described. It will be appreciated that different layouts can be  
15 constructed from the wall units of the invention as will be evident from a comparison of Figures 1 and 2. Also, the work surfaces may be of any desired shape, for example Figure 2 illustrates some shapes which are other than rectangular. Chairs 5 are also shown in Figure 2. End posts 2 also provide for the attachment of upper panels 6 above lower panels 1. The upper panels may  
20 be decorative or acoustic screens.

The wall unit shown in Figure 3 illustrates a wall unit of the invention in isolation and in greater detail. It comprises end posts 2 (these are not shown in their full length but are cut away so to show the configuration of the edge portions of lower panel 1). Lower panel 1 comprises a frame 7, for example of steel, to  
25 which facia panels 8 and 9 are removably attached. The frame 7 includes cable management trays (not shown) which are accessible via hinged or slidable panels 10 on each face of the lower panel 1. Lower panel 1 also includes a top cap or sill 11 which is also removably mounted to the frame 7. As will be described, panel 1 is clamped at either end to end posts 2 and the end posts extend above  
30 the sill level of lower panel 1 to support upper panel 6 which is seated on top of the sill 11. Upper panel 6 is readily interchangeable and is not secured to the posts other than by sliding engagement.

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Frame 7 of lower panel 1 provides the attachment fitting of the panel which includes a longitudinally extending rib section 12 (see Figure 4).

End posts 2 are made from a metal extrusion (this is preferably aluminium) and have a cross section as shown in Figure 5. This cross section defines a pair of oppositely disposed open channels 13 and 14 and another pair of oppositely disposed channels 15 and 16 which are partially closed by transverse flanges 17. The section also defines a central closed channel 18.

When a lower panel 1 is clamped to an end post 2 (as will be described) a structural joint is formed wherein, as shown in Figure 5, rib section 12 of frame 7 of lower panel 1 is seated within a channel 13 or 14 of end post 2. A clamping arrangement for securing lower panel 1 to an end post 2 (see Figure 4) includes two spaced fittings for each channel 13 or 14 each top one of which is a clamp plate 20 fixed within each channel by a screw 21 and each bottom one of which is a lug 22 on a bottom fitting 23 for the post. The fittings 20,22 each include a ramp surface 24,25 respectively, which engage upper and lower ends 26,27 of the longitudinally extending rib section 12 of frame 7 of lower panel 1. A tie rod 28 which passes through central channel 18 of end post 2 has a screw section 31 at its lower end for fixing the tie rod to bottom fitting 23. Tie rod 28 also has a screw threaded bore 32 at its upper end for receiving a clamping screw 30 which passes through the top cap 29 for the end post 2. Bottom fitting 23 for the end post may contain a foot 33 which may be screwed into the fitting such that its position is adjustable relative to the fitting.

Prior to the assembly of a lower panel with the end posts, clamp plates 20 are fixed within channels 13 and 14 by screws 21 and end post 2 is seated on bottom fitting 23 with tie rod 28 extending through central channel 18 and screwed into fitting 23. To assemble a lower panel to the end post, end 27 of rib section 12 of the lower panel is first seated over lug 22 of bottom fitting 23 and the panel is positioned such that rib section 12 is aligned with and substantially within channel 14 of the end post. End post 2 is then manually lifted a small amount and then lowered so as to place clamp plate 20 over the top end 26 of rib section 12 of the lower panel. The end faces 26 and 27 of rib section 12 of lower panel 1 are then engaged by ramp surfaces 24 and 25 of fittings 20 (the upper clamp plate) and 22 (the lug on bottom fitting 23). To clamp the lower panel in

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position, top cap 29 is fitted onto the end post 2 and clamping screw 30 is then inserted and screwed into bore 32 of tie rod 28, which action draws bottom fitting 23 (and thus lug 22) towards clamp plate 20 and thereby cause ramp surfaces 24 and 25 to clampingly engage the ends 26 and 27 of the rib section 12.

5        The fitment of clamp plates 20 within channels 13 and 14 some distance below the top of end post 2 leaves the top portions of channels 13 and 14 free of any obstructions such that upper panel 6 can be supported along its vertical edges by those channels. Upper panels 6 are thus easily fitted to sit on top of sill 11 by sliding them into position between two end posts 2 from the top end of the  
10        respective end posts.

      Whilst the clamping system described above is the preferred mechanism whereby the lower panel is secured to the end posts, the invention is not limited to such a securement means. The invention embodies any arrangement in which the securement means for securing the lower panel to the end posts is provided  
15        within the end post.

      Figures 7a and 7b illustrate a particular arrangement for mounting support brackets to end posts 2. As shown in Figure 5, partially closed channels 15 and 16 of end posts 2 may each slidably contain a slider strip 34 (illustrated in Figures 7a and 7b). Slider strip 34 is U shaped in transverse cross section. The base of  
20        the U part of slider strip 34 contains a series of longitudinally spaced slots 35 for receiving complimentary tongues 36 of a bracket 37 for mounting the bracket such that it is supported by and extends at right angles from the slider. Brackets such as 37, when mounted to end posts 2 in a wall unit, are for supporting shelves, cabinets, work surfaces or the like, as may be provided for a work  
25        station.

      Flanges 17 of channels 15 and 16 hold the slider strips 34 captive within the channels. Each strip 34 is positioned such that the base of the U is adjacent the flanges 17 and the arms of the U are directed inwardly of end post 2. Teeth 38 may be formed along a longitudinally extending free edge of each leg of the U  
30        of slider 34 as is shown in Figure 7a. Apertures 39 are provided in end post 2 to allow the teeth of each slider strip to be accessed by a means for engaging those teeth for adjusting the position of a slider within its channel. The means for engaging teeth 38 of each slider may be a pinion gear 40, which may be manually

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driveable or power driven via shaft 41.

In a possible power driven arrangement, an electric motor 42 may be incorporated in a lower panel 1 (see Figure 9) for driving one or two shafts 41 on the end or ends of which is/are mounted pinion gears 40 for entry into apertures 39 of an end post 2 to engage teeth 38 of slider(s) 34 (it will be appreciated that a slider 34 is effectively a rack for a pinion gear 40). Shafts 41 may extend to both edges of a lower panel 1 such that when that panel is mounted between two end posts 2, sliders 34 in each post can be coordinatngly adjusted by operation of the one motor 42, thereby enabling a shelf or work surface, which is supported between those end posts by sliders 34, to be maintained level as its height is adjusted.

It will be realised, of course, that a tie rod 28 passing through an end post 2 will not impede transfer of the power drive provided by a motor 42 to an adjacent panel (for example shown by reference 51 in Figure 9) and thus to a third post at the other edge of that panel. This is possible by virtue that a driven pinion 40 drives a slider 34 via its meshing with teeth 38 on one of the legs of the U of the slider and that therefore the teeth on the other leg of the U of a slider 34 will provide the drive for a pinion 50 on the shaft 52 in panel 51.

Work surfaces 3 which are supported by supports 4 (see Figure 1) may also be connected with and thus additionally supported by sliders 34 and end posts 2. As is known, supports 4 may include height adjustment means (not shown), in which case the connection of a work surface to sliders 34 provides for lateral stabilization of the work surface and for its guidance whilst being height adjusted via supports 4.

The invention also includes channels 15 or 16 of an end post 2 (without a slider 34) being used to laterally stabilise and guide a height adjustable surface 3. To realise this feature, suitable lugs or brackets (not shown) attached to work surfaces 3 are slidngly received in channels 15 or 16 such that lateral movement of the brackets is restricted whilst they are freely vertically moveable.

As an alternative, or in addition to the arrangement shown in Figures 7a and 7b for mounting support brackets to end posts 2, it is preferred that the post cap 29 (as shown in Figure 6) include at least one transverse slot 53 as is shown in Figure 10. The transverse slot 53 is shaped to receive a co-operating member

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formed at the end of a shelf/hanger bracket 54. The transverse slot 53 is of such shape that it does not interfere with clamping screw 30. In Figure 11, there is illustrated an end post 2 to which top cap 29 has been fitted with brackets 54 attached to the top cap by engagement within the transverse slots 53.

- 5           Whilst very specific embodiments of the invention are shown by reference to the drawings, it will be appreciated that various modifications, additions and variations are possible having regard to the key aspects of the invention. As the lower panel is securely attached to the end posts by means which does not interfere with the attachment of the upper panel to the end posts, the primary
- 10   structure of the wall unit is formed by the end posts and the lower panel being secured therebetween. This enables economical and easy replacement and variation to the upper panels to meet end user needs. Thus, it is to be understood that any variations, modifications and/or additions from the particular preferred embodiments described which have these features are considered to
- 15   fall within the spirit and scope of the invention.

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The Claims defining the invention are as follows:-

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1. A partition wall unit which has upper and lower panels both of which are held in position at either end by respective end posts wherein at least the lower  
5 panel includes attachment fittings adapted to engage with the end posts and wherein each end post includes a securement means adapted to retain the lower panel in position; said securement means being operable so to permit repeated engagement and disengagement of the lower panel to the end posts.
2. A partition wall unit as claimed in claim 1 wherein the upper panel is held in  
10 position between the end posts by different means to that utilized for securing the lower panel between the said posts and wherein the upper panel does not constitute a significant structural component of the partition wall unit.
3. A partition wall unit as claimed in either one of claims 1 or 2 wherein the upper panel is held in position between the posts but is not secured thereto.
- 15 4. A partition wall unit as claimed in claim 3 wherein the upper panel is slidably engageable with the posts.
5. A partition wall unit as claimed in any one of the previous claims wherein each end post includes a longitudinal channel extending from a position proximate to the bottom of the post to the top of the post and wherein the  
20 attachment fittings of the lower panel are adapted so to engage within the respective channels in the end posts.
6. A partition wall unit as claimed in claim 5 wherein the upper panel is held in position by sliding engagement of the edges of the upper panel into the respective channels in the posts.
- 25 7. A partition unit as claimed in any one of the previous claims wherein the end posts both include at least one longitudinally extending open channel for receiving an attachment fitting of the lower panel in which the channels include means adapted to clamp said attachment fitting to the respective end posts and to thereby fix the lower panel in position and in which the means for clamping is  
30 operable from the top end of each of the said posts.
8. A partition wall unit as claimed in claim 7 wherein the means for clamping the attachment fitting in each end post includes two fittings which are spaced apart along the longitudinal channel in the post wherein each fitting is engageable

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with the respective top and bottom end of the attachment fitting of the lower panel.

9. A partition wall unit as claimed in claim 8 wherein the relative spacing of the fittings within the channels of the end posts are adjustable from the top ends  
5 of the posts.

10. A partition wall unit as claimed in either one of claims 8 or 9 wherein one of the said fittings in each post is fixed within the channel and the other is adjustable relative thereto by a screw means that is accessible at the top end of the post.

11. A partition wall unit as claimed in claim 10 wherein a bottom fitting for each  
10 of the end posts provides the said adjustable fitting and the other fitting is provided by a clamp plate which is fixed within the channels in the end posts.

12. A partition wall unit as claimed in claim 11 wherein a tie rod is connected to the bottom fitting.

13. A partition wall unit as claimed in any one of the previous claims wherein  
15 the end posts incorporate a separate post cap in which said post cap includes a transverse channel adapted to co-operate with a shelf bracket.

14. A partition wall unit as claimed in any one of the previous claims in which the upper panel is thinner than the lower panel.

15. A partition wall unit as claimed in claim 14 wherein each end post includes  
20 a longitudinal channel extending from a position proximate to the bottom of the post to the top of the post and wherein said upper panel has a thickness that is substantially equal to the width of the said channel.

16. A partition wall unit as claimed in either one of claims 14 or 15 wherein said upper panel rests on an upper edge surface of said lower panel and the  
25 relative thicknesses of the said upper panel and lower panel are such that said upper edge surface provides a sill on at least one of the sides of the partition wall unit.

17. A panelling system including at least one partition wall unit as claimed in any one of the preceding claims which further includes at least one additional end  
30 post and one additional lower panel such that the additional lower panel is engaged with one of the end posts of the partition wall unit at one edge and engaged with the additional end post at the other edge.

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18. A partition wall unit substantially as hereinbefore described with reference to what is shown in any one of the drawings.
19. A panelling system as hereinbefore described with reference to what is shown in either one of Figures 1 or 2.

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