

FURNITURE SYSTEM

TECHNICAL FIELD

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The present invention relates to a furniture system and a partition panel for use in a furniture system.

BACKGROUND

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Furniture systems such as those used in office environment employ partition walls to form cubicles of various layouts and sizes according to actual office plan and usage requirements. Often it is required to change the partition layout of such cubicles to adapt to new requirements, e.g. increase of the number of users. Such change of partition layout requires disassembling and re-assembling of partition walls. Conventional partition walls include support posts and panels mounted to the post by screws. While screws may provide desired mounting strength between the posts and panels, disassembling and re-assembling of partition walls require frequent and repeat work of unscrewing and screwing operations. Such operations are labor-intensive, require fair amount of time during the disassembling / reassembling processes. In addition, frequent screwing and unscrewing operations may damage the partition parts e.g. wood panels and results in increased costs for replacement of new panels.

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It is therefore desirable to provide a furniture system using partition panels to allow quick and efficient assembling and disassembling operations.

SUMMARY OF THE INVENTION

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According to one embodiment, the present invention provides a furniture system including a partition wall assembly for use in e.g. an office environment. The partition wall has a pair of posts, a panel disposed between the pair of posts, and a pair of connecting members each being slidable relative to the pair of posts and the panel along a

longitudinal direction. Each connecting member engages to one of the pair of posts and the panel to restrict relative movement between the pair of posts and the panel along a lateral direction intersecting the longitudinal direction.

5 The panel may have first and second side edges each being arranged adjacent to one post. Each side edge has a groove formed thereon along a first direction parallel to the side edge. Each groove has an inner groove portion and an outer groove portion. The outer groove portion is narrower than the inner groove portion. Each post has a first channel formed thereon along the first direction. The first channel has an inner channel
10 portion and an outer channel portion. The outer channel portion is narrower than the inner channel portion. Each connecting member has a first end portion, a second end portion and a middle portion between the first end portion and the second end portion. The first end portion is slidably fitted into the inner groove portion of the panel along the first direction. The second end portion is slidably fitted into the inner channel portion of the
15 post along the first direction. The middle portion is positioned through the outer groove portion and the outer channel portion. The first end portion is wider than the inner groove portion, and the second end portion is wider than the inner channel portion, such that relative movement between the pair of posts and the panel along a second direction perpendicular to the first direction is restricted by the connecting members. The panel and
20 the pair of posts are therefore held together by the connecting members to form an integral partition panel.

 The present invention has the advantages of quick assembling and disassembling partition panels, without use of screws during the assembling and disassembling
25 operations.

 Other aspects and advantages of the present invention will become apparent from the following detailed description, illustrating by way of example the inventive concept of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the present invention will be described in detail with reference to the accompanying drawings, in which:

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Fig. 1 is a perspective view showing a furniture system according to one embodiment of the present invention.

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Fig. 2 is a perspective view showing a partition wall assembly of the furniture system of Fig. 1.

Fig. 3 is an exploded view of Fig. 2.

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Fig. 4 is a partial enlarged perspective view showing a panel half-way assembled to the pair of posts of the partition wall assembly of Fig. 2.

Fig. 5 is a partial enlarged perspective view showing a panel board assembled to the pair of posts of the partition wall assembly of Fig. 2.

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Fig. 6 is a partial exploded perspective view of Fig. 4 before the panel is attached to a post.

Fig. 7 is a partial enlarged perspective view of Fig. 4 before a connection member is inserted into the post and the panel.

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Fig. 8 is a cross sectional top view of Fig. 7 after the connecting member is connected to the panel and the post.

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Fig. 9 is an exploded partial perspective view showing a top bar assembly of the partition wall assembly as shown in Fig. 2.

Fig. 10 is a perspective view showing the top bar assembly of Fig. 10 in a partial assembled state.

Fig. 11 is a perspective view showing the top bar of Fig. 10 to be assembled to a partition wall assembly as shown in Fig. 2.

Fig. 12 is an enlarged partial view of Fig. 2 when the top bar is assembled to the panel.

Fig. 13 is an exploded partial perspective view showing a bottom bar of the partition wall assembly as shown in Fig. 2.

Fig. 14 shows the bottom bar and the panel of Fig. 13 viewing from another angle.

Fig. 15 is an enlarged partial view showing the bottom bar when assembled to the panel.

Fig. 16 shows the bottom bar and the panel viewing from another angle.

Fig. 17 is a partial perspective view showing a post structure according to another embodiment of the present invention.

Fig. 18 is a partial perspective view showing a post of a partition panel according to yet another embodiment of the present invention.

Fig. 19 is a partial perspective view showing the post of Fig. 18 when assembled to two panels.

Figs. 20, 21 and 22 are cross sectional viewings showing the structure of posts according to various alternative embodiments of the present invention.

Fig. 23 is a perspective view showing a furniture system according to a further embodiment of the present invention.

5 Fig. 24 is a partial enlarged perspective view of Fig. 23 showing a support member attached to a post in a furniture system as shown in Fig. 23.

Fig. 25 is a perspective view showing the support member of Figs. 23 and 24.

10 Fig. 26 is an exploded perspective view of Fig. 25 viewing from another angle.

Figs 27 to 29 are cross sectional views showing a process of assembling the support member to the post in a furniture system as shown in Fig. 23.

15 Fig. 30 is an exploded perspective view of Fig. 24.

Fig. 31 is a cross sectional view showing the support member positioned into the channel of the mounting post in a furniture system as shown in Fig. 23.

20 Figs. 32 and 33 are perspective and cross sectional views showing the support member fixed to the mounting post.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

As shown in Figs. 1 to 5, a furniture system 100 according to one embodiment of present invention includes one or more partition wall assemblies 102, for use in e.g. an open office environment to form cubicles. Each partition wall assembly 102 includes a pair of posts 110, one or more panels 120 disposed between the pair of posts 110, and connecting members 130 holding post 110 and panel 120 together. Partition wall assembly 102 may also include a top bar 140 and a bottom bar 150 assembled to the pair of posts 110 and panel 120, to further improve the strength and external appearance of the partition wall assembly. Panel(s) 120 and connecting members 130 are assembled to posts 110 along a height or longitudinal direction 12 of posts 110.

As shown in Figs. 6 to 8, panel 120 has a side edge 120a positioned to contact a post 110. A groove 121 is formed on side edge 120a along longitudinal direction 12, i.e. parallel to side edge 120a. Groove 121 has an inner groove portion 122 and an outer groove portion 124 which is narrower than inner groove portion 122 (Fig. 6)

Post 110 has a side edge 110a at which a channel 111 is formed, along longitudinal direction 12. Channel 111 has an inner channel portion 112 and an outer channel portion 114 which is narrower than inner channel portion 112.

Connecting member 130 has a first end portion 131, a second end portion 132 and a middle portion 133 between first and second end portions 131, 132. First and second end portions 131 and 132 are shaped and dimensioned to match the shape and dimension of first channel portion 112 and first groove position 122, respectively. Likewise, middle portion 133 is shaped and dimensioned to match the shape and dimension of second channel portion 114 and second groove portion 124. A connecting member 130 shaped and dimensioned in this manner is therefore capable of being slidably fitted along longitudinal direction 12, into channel 111 and groove 121.

When post 110 and panel 120 are placed contacting to each other, side edge 111 of post 110 and side edge 121 act against each other. First end portion 131 has a width 131w

greater than width 114w of second channel portion 114 of post 110. Second end portion 132 has a width 132w greater than width 124w of second groove portion of panel 120. As such, when fitted into channel 111 of post 110 and groove 121 of panel 120, sliding from the top or bottom end of channel 111 and groove 121 along longitudinal direction 12, connecting member 130 restricts relative movement between post 110 and panel 120, along lateral directions 14, 16. Post 110 and panel 120 can therefore be tightly held together by connecting member 130.

When it is desired to disassemble panel 120 from post 110, connecting member 130 may be removed from post 110 and panel 120, by sliding along longitudinal direction 12. Movement restriction between post 110 and panel 120 along lateral directions 14 and 16 is released. Post 110 and panel 120 can be placed apart for next time assembly.

Figs. 9, 10 and 11 show a top bar assembly for assembling to the partition wall. Top bar assembly includes a top bar 140, one or more insert pieces 142 and a top corner member 144. Top bar 140 has a T-shaped channel 141 formed thereon. Insert piece 142 is generally T-shaped, including a first portion 142a and a second portion 142b projecting perpendicularly from first portion 142a. Insert piece 142 is dimensioned such that first portion 142a is capable of being slide into channel 141, and with second portion 142b extending outwardly from channel 141.

Corner member 144 is mounted to top bar 140, by inserting a fixing portion 146 into channel 111. Corner member 144 has a wedge 148 projecting downwardly. After insert piece 142 is slide into channel 141, corner piece 144 is inserted into and fixed to the end portion of channel 141.

To install the top bar assembly to the partition wall assembly, as shown in Figs. 11 and 12, top bar 140 is placed on top of panel 120, with second portion 142b of insert piece 142 inserted into top groove 122b formed on panel 120, in a press-fit manner. In the meantime, wedge 148 is inserted into the top end of channel 111 of vertical post 110, also in a press-fit manner. Top bar assembly is now installed to vertical post 110 and panel 120, as shown in Fig. 12.

A bottom bar assembly may also be installed to the partition wall assembly, as shown in Figs. 13 to 16. Bottom bar assembly includes a bottom bar 150 and a projection 152 extending upwardly from bottom bar 150. A pair of corner members 154 is fixed to bottom bar 150, via a foot support 156. Corner member 154 has a corner projection 158 formed integral thereto.

To install the bottom bar assembly to the partition wall assembly, as shown in Figs. 13 to 16, bottom bar 150 is placed underneath panel 120, and with projection 152 inserted into bottom groove 122c of panel 120, in a press-fit manner. In the meantime, corner projection 158 is inserted into the bottom end of channel 111 of vertical post 110, also in a press-fit manner.

Fig. 17 shows a post structure according to another embodiment of the present invention. A post 210 includes a channel segment 218, formed at a middle portion of post 210. Channel segment 218 has a width 218w slightly greater than width 231w of the first end portion 231 of connecting member 230. Channel segment 218 can therefore allow connecting member 230 to fit into channel 211 at a middle portion of post 210, i.e. without the need of fitting into channel 211 from the top or bottom end of post 210.

According to alternative embodiments, the present invention provides partition panels which may be configured to suite different office furniture layout needs. For example, Figs. 18 and 19 show a post 310 for use in a right-angled partition wall structure of a furniture system. Post 310 has two channels 311a and 311b formed thereon. Channels 311a and 311b are formed in a right-angle relative to each other. Each channel is capable of being assembled to a respective panel 320a, 320b, by connecting members 330 in a manner similar to that of the previous embodiment, to form two partition panels joining to each other in a perpendicular positional relationship, as shown in Fig. 19.

In further embodiments, a post 410 has two channels 411a and 411b formed in a back-to-back manner, as shown in Fig. 20, for joining two panels together. A post 510 has three channels 511a, 511b and 511c, as shown in Fig. 21, for joining three panels together.

A post 610 has four channels 611a, 611b, 611c and 611d, as shown in Fig. 22, for joining four panels together. These various types of posts may be used in a furniture system to suite the needs of different layout and assembly arrangements.

5 According to a further embodiment, as shown in Figs. 23 and 24, the present invention provides a furniture system 700 which includes one or more partition walls 702, a desktop surface 704, and one or more support members 750 mounted to a vertical post 710, for supporting desktop surface 704 to the posts.

10 As shown in Figs. 25 and 26, support member 750 includes a main part 760 and an auxiliary part 770 detachably mounted to main part 760. Main part 760 has a main body portion 762 defining a center line 761 thereon. Formed integral to main body portion 762 is a main neck portion 764 which connects to a main head portion 766. Main head portion 766 is positioned offset from center line 761 at one side. A threaded hole 768 is formed
15 on main body portion 762 along center line 761. A projection 769 is formed on main body portion 762. A screw or bolt 790 engages threaded hole 768, and moveable along center line 761.

 Auxiliary part 770 has an auxiliary body portion 772, an auxiliary head portion 776
20 in front of auxiliary body portion 772 and an auxiliary neck portion 774 connecting auxiliary body portion 772 and auxiliary head portion 776. A hook portion 779 extends backward from auxiliary body portion 772.

 Post 710 has a mounting channel 711 formed of a pair of sidewalls 712 and a pair
25 of end walls 714 each extends perpendicularly from a respective sidewall 712. The width of channel 711, defined by the pair of sidewalls 712, is slightly greater than the sum of the width of main head portion 766 of main part 760 and auxiliary head portion 776 of auxiliary part 770. The pair of end walls 714 forms a gap 716 therebetween. Gap 716 has a width slightly greater than main head portion 766 of main part 760 and auxiliary head
30 portion 776 of auxiliary part 770. This allows insertion of main head portion 766 and auxiliary head portion 776, one after another, into mounting channel 711, along a direction intersecting post 710, e.g. a direction 782 perpendicular to post 710 (Fig. 24).

To mount supporting member 750 to post 710, main part 760 and auxiliary part 770 are separated and each being individually inserted into channel 710, along perpendicular direction 782. When main head portion 766 is fully positioned inside channel 711, main part 760 is shifted sideward, along lateral direction 784, as shown in Figs. 27 and 28. Thereafter, as shown in Figs. 29 and 30, auxiliary part 770 is inserted into channel 711, along perpendicular direction 782, in a manner similar to the insertion of main part 760. To avoid interference with main part 760 during insertion into channel 711 of mounting post 710, auxiliary part may be shifted along vertical direction, as shown in Fig. 30. When auxiliary head portion 776 is fully positioned inside channel 711, auxiliary part 770 is shifted sideward, along opposite lateral direction 786, and then further shifted downward, to be in alignment with main part 760, as shown in Figs. 31 and 32.

As shown in Figs. 32 and 33, bolt 790 is now rotated, by wrench 70, to move forward and acts against auxiliary body portion 772. The engagement between projection 769 of main part 760 and hook portion 779 of auxiliary part 770 restricts the sliding movement of auxiliary part 770 relative to main part 760. Instead, the force exerted onto auxiliary body portion 772 by bolt 790 generates a moment, to rotate auxiliary part 770 relative to main part 760, about a fulcrum 777 formed at the contact interface between projection 769 of main part 760 and hook portion 779 of auxiliary part 770. Following this rotational motion, auxiliary head portion 776 of auxiliary part 770 moves away from main head portion 766 of main part 760. Further advancement of bolt 790 against auxiliary body portion 772 generates a tendency to move auxiliary head portion 776 of auxiliary part 770 further away from main head portion 766 of main part 760. This movement of auxiliary head portion 776 is restricted by the pair of sidewalls 712 of channel 711. As a result, main head portion 766 and auxiliary head portion 776 are brought into tight contact with the pair of sidewalls 712, to tightly fix supporting member 750 to mounting post 710, at a predetermined vertical position.

A supporting member according to the present embodiment is capable of being fixed to a vertical mounting post, by inserting into the channel from the side surface, at any predetermined position. Therefore, it is not necessary to insert the support member

from the top or bottom end of the mounting post. Operational convenience and efficiency is improved.

Although embodiments of the present invention have been illustrated in
5 conjunction with the accompanying drawings and described in the foregoing detailed
description, it should be appreciated that the present invention is not limited to the
embodiments disclosed. Therefore, the present invention should be understood to be
capable of numerous rearrangements, modifications, alternatives and substitutions without
departing from the spirit of the invention as set forth and recited by the following claims.

CLAIMS

1. A furniture system comprising:

a partition wall assembly having a pair of posts and a panel disposed between
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a pair of connecting members each being slidable relative to the pair of posts
and the panel along a longitudinal direction, and each connecting member
engaging to one of the pair of posts and the panel to restrict relative
movement between the pair of posts and the panel along a lateral direction
10 intersecting the longitudinal direction.

2. The furniture system of claim 1, wherein:

the panel having a first side edge and a second side edge, each side edge being
positioned adjacent to one of the pair of posts, each side edge has a groove
15 formed thereon along the longitudinal direction parallel to the side edge,
each groove has an inner groove portion and an outer groove portion,
wherein the outer groove portion is narrower than the inner groove portion;

each one of the pair of posts has a first channel formed thereon along the
longitudinal direction, the first channel has an inner channel portion and an
20 outer channel portion, wherein the outer channel portion is narrower than
the inner channel portion;

the pair of connecting members each having a first end portion, a second end
portion and a middle portion between the first end portion and the second
end portion, the first end portion being slidably fitted into the inner channel
25 portion of the post along the longitudinal direction, the second end portion
being slidably fitted into the inner groove portion of the panel along the
longitudinal direction, and the middle portion being positioned through the
outer groove portion and the outer channel portion;

wherein the first end portion is wider than the inner channel portion and the
30 second end portion is wider than the inner groove portion, such that relative
movement between the pair of posts and the panel along lateral is restricted
by the connecting members.

3. The furniture system of claim 2, further comprising a bottom bar attached to a bottom side edge of the panel, and a pair of bottom corner members each being attached to the bottom bar and to one of the pair of posts.
- 5 4. The furniture system of claim 3, further comprising a projection extending upwardly from the bottom bar, wherein the projection is press-fitted into the bottom side edge of the panel.
- 10 5. The furniture system of claim 2, further comprising a top bar attached to a top side edge of the panel, and a pair of top corner members each being attached to the top bar and to one of the pair of posts.
- 15 6. The furniture system of claim 5, wherein each one of the top corner member having a wedge member formed thereon and fitted into the first portion of channel of a corresponding post.
- 20 7. The furniture system of claim 5, further comprising an insert piece projecting downwardly from the top bar, wherein the insert piece is press-fitted into the top side edge of the panel.
8. The furniture system of claim 7, wherein the insert piece is slidable along the top bar before the top bar is press-fitted into the top side of the panel.
- 25 9. The furniture system of claim 2, wherein at least one of the pair of posts includes a segment at which the outer channel portion has a same width as the inner channel portion to allow insertion of the connecting member into the channel along the second direction.
- 30 10. The furniture system of claim 1, further comprising a supporting member attached to one of the pair of posts to support a desktop surface to said one of the pair of posts.

11. The furniture system of claim 10, wherein said one of the pair of posts further includes a second channel parallel to the first channel, the second channel has a pair of sidewalls facing to each other, wherein the support member is attached to the post between the pair of sidewalls.

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12. The furniture system of claim 11, wherein the support member includes a main part and an auxiliary part detachably mounted to the main part.

13. The furniture system of claim 12,

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wherein the main part of the support member having:

a main body portion defining a center line thereon;

a threaded hole formed on the body portion along the center line;

a main head portion in front of the threaded hole and offset from the center line at one side;

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a main neck portion connecting the main body portion and the main head portion;

a projection extending outwardly from the main part at an opposite side of the center line, and

a bolt engaged to the threaded hole;

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wherein the auxiliary part of the support member having:

an auxiliary body portion positioned in front of the threaded hole;

an auxiliary head portion;

an auxiliary neck portion connecting the auxiliary body portion and the auxiliary head portion;

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a hook portion connected to the auxiliary body portion and engaged to the projection to form a fulcrum,

wherein the bolt acts against the auxiliary body portion, and advancement of the bolt causes rotation of the auxiliary part relative to the main part about the fulcrum, by which, the main head portion and the auxiliary head portion engages the pair of sidewalls of the second channel to fix the support member to the post.

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14. The furniture system of claim 13, wherein the second channel further including a pair of end walls each extending perpendicularly from a respective sidewall, the pair of end walls forms a gap therebetween through which the main head portion and the auxiliary head portion pass along a direction intersecting the post.

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15. The furniture system of claim 14, wherein the main head portion and the auxiliary head portion each having a head width the same as a gap width between the pair of end walls, and each neck portion has a neck width about half of the gap width.

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16. A support member for attaching to a side edge of a post, the post having a channel along the side edge, the channel having a pair of sidewalls parallel to each other and a pair of end walls each extending from a respective sidewall, the pair of end walls face to each other and form a gap therebetween, the support member comprising:

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a main part having

a main body portion defining a center line thereon;

a threaded hole formed on the body portion along the center line;

a main head portion in front of the threaded hole and offset from the center line at one side;

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a main neck portion connecting the main body portion and the main head portion;

a projection extending outwardly from the main part at an opposite side of the center line, and

a bolt engaged to the threaded hole;

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an auxiliary part detachably mounted to the main part, the auxiliary part having

an auxiliary body portion positioned in front of the threaded hole;

an auxiliary head portion;

an auxiliary neck portion connecting the auxiliary body portion and the auxiliary head portion;

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a hook portion connected to the auxiliary body portion and engaged to the projection to form a fulcrum,

wherein the bolt acts against the auxiliary body portion, and advancement of the bolt causes rotation of the auxiliary part relative to the main part about the fulcrum, by which, the main head portion and the auxiliary head portion engages the pair of sidewalls of the second channel to fix the support member to the post.